CITY OF ONTARIO

Regular City Council/Housing Authority Meeting
APRIL 19, 2022

City Hall
303 East B Street, Ontario, CA 91764

MAYOR PAUL S. LEON • MAYOR PRO TEM ALAN D. WAPNER
COUNCIL MEMBERS JIM W. BOWMAN, DEBRA DORST-PORADA AND RUBEN VALENCIA

CITY CLERK SHEILA MAUTZ • TREASURER JAMES R. MILHISER
CITY MANAGER SCOTT OCHOA • CITY ATTORNEY RUBEN DURAN

WELCOME TO A MEETING OF THE ONTARIO CITY COUNCIL

All documents for public review are on file with the Records Management/City Clerk's Department located at 303 East B Street, Ontario, CA 91764.

Anyone wishing to speak in person during public comment or on a particular item will be required to fill out a blue slip. Blue slips must be turned in prior to public comment beginning or before an agenda item is taken up. The Clerk will not accept blue slips after that time. To comment by email, submit your comments no later than 4:00 p.m. on the day of the meeting by emailing your name, agenda item you are commenting on and your comments to publiccomments@ontarioca.gov. All comments received by the deadline will be forwarded to the City Council for consideration before action is taken on the matter and will be entered into the record.

Comments will be limited to 3 minutes. Speakers will be alerted when they have 1 minute remaining and when their time is up. Speakers are then to return to their seats and no further comments will be permitted.

In accordance with State Law, remarks during public comment are to be limited to subjects within Council's jurisdiction. Remarks on other agenda items will be limited to those items.

Remarks from those seated or standing in the back of the chamber will not permitted. All those wishing to speak including Council and Staff need to be recognized by the Chair before speaking.

WEARING A MASK DURING THE PUBLIC MEETING IS STRONGLY ENCOURAGED.

If you need special assistance or accommodations to participate in this meeting, please contact

the City Clerk's office at 909-395-2009. Notification of 48 hours prior to the meeting will help the City make reasonable arrangements. Equipment for the hearing impaired is available in the Records Management Office.

ORDER OF BUSINESS

The regular City Council and Housing Authority meeting begins with Closed Session and Closed Session Comment at 5:30 p.m., Public Comment at 6:30 p.m. immediately followed by the Regular Meeting and Public Hearings. No agenda item will be introduced for consideration after 10:00 p.m. except by majority vote of the City Council.

CALL TO ORDER *(OPEN SESSION)*

ROLL CALL

Wapner, Bowman, Dorst-Porada, Valencia, Mayor/Chairman Leon

CLOSED SESSION PUBLIC COMMENT

The Closed Session Public Comment portion of the Council/Housing Authority meeting is limited to a maximum of 3 minutes for each speaker and comments will be limited to matters appearing on the Closed Session. Additional opportunities for further Public Comment will be given during and at the end of the meeting.

CLOSED SESSION

GC 54956.9 (d)(1), CONFERENCE WITH LEGAL COUNSEL-EXISTING LITIGATION Wendie Rios v. City of Ontario et al., Superior Court of California, County of San Bernardino Case No: CIVDS1828142

GC 54956.8 CONFERENCE WITH REAL PROPERTY NEGOTIATORS Property: APN: 1048-562-01; 215 West C Street; City/Authority negotiator: Scott Ochoa, City Manager or his designee; Negotiating parties: United Christian Church of Hacienda Heights; Under negotiation: Price and Terms of Payment

ATTACHMENT: 20220419 Closed Session

PLEDGE OF ALLEGIANCE

Council Member Valencia

INVOCATION

Pastor Benjamin Barlow, First Christian Church

REPORT ON CLOSED SESSION

City Attorney

PUBLIC COMMENTS **6:30 P.M.**

The Public Comment portion of the Council/Housing Authority meeting is limited to 30 minutes with each speaker given a maximum of 3 minutes. An opportunity for further Public Comment may be given at the end of the meeting. Under provisions of the Brown Act, Council is prohibited from taking action on oral requests.

To comment by email, submit your comments by email no later than 4:00 p.m. on the day of the meeting by emailing your name, agenda item you are commenting on and your comment to publiccomments@ontarioca.gov. All Comments received by the deadline will be forwarded to the City Council for consideration before action is taken on the matter and entered into the record. As previously noted -- if you wish to address the Council, fill out one of the blue slips at the rear of the chambers and give it to the City Clerk.

AGENDA REVIEW/ANNOUNCEMENTS

The City Manager will go over all updated materials and correspondence received after the Agenda was distributed to ensure Council Members have received them. He will also make any necessary recommendations regarding Agenda modifications or announcements regarding Agenda items to be considered.

SPECIAL CEREMONIES

Honoring the Chaffey Academic Decathlon Team

CONSENT CALENDAR

All matters listed under CONSENT CALENDAR will be enacted by one motion in the form listed below – there will be no separate discussion on these items prior to the time Council votes on them, unless a member of the Council requests a specific item be removed from the Consent Calendar for a separate vote.

Each member of the public wishing to address the City Council on items listed on the Consent Calendar will be given a total of 3 minutes.

1. APPROVAL OF MINUTES

Minutes for the regular meetings of the City Council and Housing Authority of March 15, 2022, and approve the same as on file in the Records Management Department.

ATTACHMENT: 20220315 Minutes (Not official until approved).pdf

2. BILLS & PAYROLL

Bills March 18, 2022 through March 31, 2022, and Payroll March 13, 2022 through March 26, 2022 when audited by the Finance Committee.

3. RESOLUTIONS DEDICATING RIGHT-OF-WAY EASEMENTS FOR PUBLIC ROAD AND UTILITY PURPOSES OVER A PORTION OF CITY-OWNED PARCELS AT BUDD STREET AND FERN AVENUE, MAITLAND STREET AND BON VIEW AVENUE, AND WALNUT STREET AND CAMPUS AVENUE

That the City Council consider and adopt three Resolutions dedicating right-of-way easements for public road and utility purposes over a portion of City-owned parcels at Budd Street and Fern Avenue (APN: 1050-051-31, 32, 33), Maitland Street and Bon View Avenue (APN: 1049-451-01, 02, 24), and Walnut Street and Campus Avenue (APN: 1051-381-06); and authorize the City Manager or his designee to execute the easement deeds.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, DEDICATING A RIGHT-OF-WAY EASEMENT FOR PUBLIC ROAD AND UTILITY PURPOSES OVER A PORTION OF CITY-OWNED PARCELS (DE ANZA PARK, COMMUNITY & TEEN CENTER) AT BUDD STREET AND FERN AVENUE – APN: 1050-051-31, 32, 33.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, DEDICATING A RIGHT-OF-WAY EASEMENT FOR PUBLIC ROAD AND UTILITY PURPOSES OVER A PORTION OF CITY-OWNED PARCELS (BON VIEW PARK) AT MAITLAND STREET AND BON VIEW AVENUE – APN: 1049-451-01, 02, 24.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, DEDICATING A RIGHT-OF-WAY EASEMENT FOR PUBLIC ROAD AND UTILITY PURPOSES OVER A PORTION OF A CITY-OWNED PARCEL (KIMBALL COMMUNITY PARK) AT WALNUT STREET AND CAMPUS AVENUE – APN: 1051-381-06.

ATTACHMENT: 20220419 Budd ROW Dedication^01 EXH 1
ATTACHMENT: 20220419 Maitland ROW Dedication^02 EXH 2
ATTACHMENT: 20220419 Walnut ROW Dedication^03 EXH 3
ATTACHMENT: 20220419 Budd ROW Dedication 04 RESO^RM
ATTACHMENT: 20220419 Budd ROW Dedication^05 Deed
ATTACHMENT: 20220419 Maitland ROW Dedication 06^RESO^RM
ATTACHMENT: 20220419 Maitland ROW Dedication^07 Deed
ATTACHMENT: 20220419 Walnut ROW Dedication^08^RESO^RM
ATTACHMENT: 20220419 Walnut ROW Dedication^09 Deed

4. **ACCEPTANCE OF GRANT AWARD FROM THE U.S. DEPARTMENT OF HOMELAND SECURITY AND THE CALIFORNIA OFFICE OF EMERGENCY SERVICES PROVIDED THROUGH THE FY 2020 URBAN AREA SECURITY INITIATIVE (UASI) GRANT PROGRAM**

That the City Council authorize the City Manager to execute all documents necessary to accept a three-year sub-grant award in the amount of $603,025 from the U.S. Department of Homeland Security and the California Office of Emergency Services provided through the FY 2020 UASI Grant Program.

5. **A RESOLUTION FOR PLACEMENT OF SPECIAL ASSESSMENTS ON THE SAN BERNARDINO COUNTY TAX ROLLS**

That the City Council adopt a Resolution for recovery of fees and costs incurred in abating property and dangerous building violations, as well as administrative citations and civil penalties associated with property maintenance violations, and placing assessments on the San Bernardino County Tax Rolls.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, ADOPTING A REPORT REQUESTING THE PLACEMENT OF SPECIAL ASSESSMENTS ON PROPERTY TAX BILLS FOR CIVIL PENALTIES OR RECOVERY OF COSTS INCURRED FOR ABATEMENT OF VIOLATIONS OF CITY CODES AND ORDINANCES.

ATTACHMENT: 20220419 Comm Imp Special Assessments for County Tax Rolls^01 RESO^RM
ATTACHMENT: 20220419 Comm Imp Special Assessments for County Tax Rolls^02 EXH A
ATTACHMENT: 20220419 Comm Imp Special Assessments for County Tax Rolls^03 EXH B
ATTACHMENT: 20220419 Comm Imp Special Assessments for County Tax Rolls^04 EXH C

6. **FIRST AMENDMENT TO THE CONSOLIDATED PLAN ANNUAL ACTION PLAN FOR THE 2021-22 PROGRAM YEAR AND AMENDMENT TO HOME PROGRAM PARTICIPATION AMENDMENT BETWEEEN THE CITY OF ONTARIO, ONTARIO HOUSING AUTHORITY AND MERCY HOUSE CHDO FOR THE ACQUISITION AND REHABILITATION OF 411 N. PARKSIDE AVENUE**

That City Council ("City") and the Board of the Ontario Housing Authority ("Authority") take the following actions:

1. Approve the First Amendment to the FY 2021-22 Annual Action Plan (on file in the Records Management Department) ("Substantial Amendment");
2. Approve the First Amendment to the HOME Program Participation Agreement among the City of Ontario, Ontario Housing Authority, and Mercy House CHDO, Inc. for the acquisition and rehabilitation of 411 North Parkside Avenue (on file in the Records Management Department); and
3. Authorize the City Manager/Executive Director or his designee to sign all documents necessary to implement the Agreements.

7. A RESOLUTION ESTABLISHING PARKING RESTRICTIONS FOR STREET SWEEPING PURPOSES ON CERTAIN PORTIONS OF NORTH VIRGINIA STREET BETWEEN EAST 6TH STREET AND EAST DEODAR STREET IN THE CITY OF ONTARIO

That the City Council adopt a Resolution of the City Council establishing parking restrictions for street sweeping purposes on certain portions of North Virginia Street between East 6th Street and East Deodar Street in the City of Ontario.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, ESTABLISHING PARKING RESTRICTIONS FOR STREET SWEEPING PURPOSES ON CERTAIN PORTIONS OF NORTH VIRGINIA STREET BETWEEN EAST 6TH STREET AND EAST DEODAR STREET IN THE CITY OF ONTARIO.

ATTACHMENT: 20220419 Establishing Parking Restrictions for Street Sweeping Purposes on Virginia St between 6th St. and Deodar St^RESO^RM

8. A CONSTRUCTION CONTRACT FOR A POLICE DEPARTMENT FLEET SERVICES SHOP

That the City Council take the following actions:

A. Reject Clawson Automotive Equipment and SAS Construction's bid as being non-responsive;
B. Award a Construction Contract (on file with Records Management Department) to BCM Group, Inc. of Rancho Cucamonga, California for the construction of a Police Department Fleet Services Shop in an amount not to exceed $649,999 plus a 10% contingency of $64,999 to address any unforeseen issues that may arise during construction, for a total authorized expenditure of $714,998; and
C. Authorize the City Manager, or his designee, to execute said contract and all documents required for the completion of the project and file a notice of completion at the conclusion of all construction activities.

9. AMENDMENT TO AGREEMENT WITH AXON ENTERPRISE, INC. FOR THE UPGRADE OF EQUIPMENT AND HARDWARE

That the City Council authorize the City Manager to execute an amendment to the existing five year agreement with Axon Enterprise, Inc., of Scottsdale, Arizona, for the purchase of new equipment including; cameras, maintenance, and data management services at an additional cost of $80,528 to the existing contract of $3,722,106, for a total not-to-exceed of $3,802,634.

10. A CHANGE ORDER TO THE CONSTRUCTION CONTRACT WITH DBA LETNER ROOFING CO. FOR ADDITIONAL LABOR AND MATERIALS NEEDED FOR THE SOLAR INSTALLATION PROJECT AT CITY HALL ANNEX BUILDING

That the City Council take the following actions:

A. Authorize the City Manager or his designee to execute a change order in the amount of $110,298 to the original Construction Contract for DBA Letner Roofing Co. (on file with

Records Management Department) for the solar improvement project at City Hall Annex Building. DBA Letner's Roofing Company's original contract value amount of $546,997 plus a 10% contingency of $54,699 for a total amount of $601,696. Additional funding of $110,298 will revise contract value to $711,994;

B. Authorize the City Manager to transfer the budget appropriations of $110,298 to the original Construction Contract for DBA Letner Roofing Co. (on file with Records Management Department) from the Library Roof Restoration Project. This additional funding will assist the solar improvement project at City Hall Annex Building as outlined in the Energy Service Agreement with Climatec, LLC (on file with Records Management Department).; and
C. Authorize the City Manager or his designee to execute said contract and authorize the filing of the notice of completion at the conclusion of all construction activities related to the project.

11. BUDGET AMENDMENT FOR THE PURCHASE OF FLEET VEHICLES

That the City Council authorize a $31,000 budget amendment from the Integrated Waste Fund for the purchase of two (2) Autocar Roll Off trucks in the amount of $601,000 for the Integrated Waste Department.

12. AN AMENDMENT TO THE ON-CALL DESIGN SERVICES AGREEMENT FOR ONTARIO MUNICIPAL SERVICES CENTER MODULAR OFFICES

That the City Council approve and authorize the City Manager, or his designee to execute Amendment No. 3 to the On-Call Design Service Agreement (on file in the Records Management Department) with Holt Architects, Inc. (dba Holt Architecture) of Palm Desert, California in the amount of $90,498, plus a 15% contingency of $13,575 for a total amount of $104,073.

13. REAL PROPERTY EXCHANGE BETWEEN THE CITY OF ONTARIO AND THE UNIVERSITY OF LA VERNE

That the City Council adopt a Resolution:

A. Declaring certain City-owned real property to be exempt surplus land;
B. Approving a real property exchange agreement with the University of La Verne;
C. Authorizing the City Manager to take all actions necessary with respect thereto; and
D. Finding that no further CEQA analysis is necessary

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, (I) DECLARING CERTAIN CITY-OWNED REAL PROPERTY TO BE EXEMPT SURPLUS LAND; (II) APPROVING A REAL PROPERTY EXCHANGE AGREEMENT WITH THE UNIVERSITY OF LA VERNE; (III) AUTHORIZING THE CITY MANAGER TO TAKE ALL ACTIONS NECESSARY WITH RESPECT THERETO; AND (IV) FINDING THAT NO FURTHER CEQA ANALYSIS IS NECESSARY.

ATTACHMENT: 20220419 ULV Real Property Exchange Agreement^01 RESO^RM

ATTACHMENT: 20220419 ULV Real Property Exchange^02 AGMT

14. AN AMENDMENT TO PROFESSIONAL SERVICES AGREEMENTS FOR ON-CALL APPRAISAL, PROJECT MANAGEMENT, LAND ACQUISITION, RELOCATION AND PROPERTY MANAGEMENT SERVICES

That the City Council ("City") approve and authorize the City Manager or his designee to execute Amendment No. 3 to Professional Services Agreements with R.P. Laurain & Associates in the amount of $100,000; Integra Realty Resources in the amount of $100,000; Property Specialist Inc., (dba CPSI) in the amount of $200,000; and, Amendment No. 6 to Professional Services Agreements with Transtech Engineers Inc. in the amount of $100,000.

15. FIRST AMENDMENT TO A PROFESSIONAL SERVICES AGREEMENT FOR ARCHITECTURAL AND DESIGN SERVICES

That the City Council ("City") approve and authorize the City Manager to execute a First Amendment to a Professional Services Agreements with Thirtieth Street Architects in the amount not to exceed $200,000.

16. CONSIDERATION OF A PROPOSED MILITARY EQUIPMENT USE POLICY TO COMMENCE THE APPROVAL PROCESS OF THE POLICY PURSUANT TO GOVERNMENT CODE &SECT; 7070 ET. SEQ

That the City Council receive the proposed military equipment use policy and commence the approval process for the City of Ontario to adopt the policy in accordance with Government Code § 7070 et. seq.

ATTACHMENT: 20220419 Policy 708 Military Equipment
ATTACHMENT: 20220419 Military Equipment List^03

PUBLIC HEARINGS

Pursuant to Government Code Section 65009, if you challenge the City's zoning, planning or any other decision in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the City Council at, or prior to the public hearing. Affidavits of posting compliance, for all items below, are on file with the Records Management Department.

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17. A PUBLIC HEARING TO CONSIDER A RESOLUTION CALLING A SPECIAL ELECTION FOR PROPOSED CHANGES TO THE RATE AND METHOD OF APPORTIONMENT OF THE EXISTING SPECIAL TAX OF THE CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH-FACILITIES); A RESOLUTION OF CHANGE, DECLARING RESULTS OF A SPECIAL ELECTION, DETERMINING THAT CHANGES TO THE RATE AND METHOD OF APPORTIONMENT OF THE EXISTING SPECIAL TAX OF COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH-FACILITIES) ARE LAWFULLY AUTHORIZED AND DIRECTING THE RECORDING OF AN AMENDMENT TO NOTICE OF SPECIAL TAX LIEN; A N D AN ORDINANCE AMENDING AND RESTATING ORDINANCE NO. 3082 LEVYING SPECIAL TAXES WITHIN THE CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35

(COUNTRYSIDE PHASE 2 SOUTH-FACILITIES); A RESOLUTION DEEMING IT NECESSARY TO AMEND RESOLUTION NO. 2017-124 IN ORDER TO INCREASE THE MAXIMUM AGGREGATE AMOUNT OF BONDED INDEBTEDNESS THAT CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH-FACILITIES) IS AUTHORIZED TO INCUR; A RESOLUTION CALLING A SPECIAL ELECTION FOR CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH-FACILITIES); AND A RESOLUTION DECLARING THE RESULTS OF THE SPECIAL ELECTION.

That the City Council consider and:

A. Adopt a Resolution calling a special election for proposed changes to the Rate and Method of Apportionment (the "RMA") of the existing Special Tax of City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South-Facilities), (the "CFD")
B. Adopt a Resolution declaring results of the special election, determining that changes to the Rate and Method of Apportionment of the existing Special Tax of City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South-Facilities) are lawfully authorized and directing recording of an amendment to Notice of Special Tax Lien,
C. Introduce and waive further reading of an Ordinance amending and restating Ordinance No. 3082 levying special taxes within City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South-Facilities).
D. Adopt a resolution deeming it necessary to amend Resolution No. 2017-124 in order to increase the maximum aggregate amount of bonded indebtedness that Community Facilities District No. 35 (Countryside Phase 2 South-Facilities) is authorized to incur;
E. Adopt a Resolution calling a special election for Community Facilities District No. 35 (Countryside Phase 2 South-Facilities); and
F. Adopt a Resolution declaring the results of the special election.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, CALLING A SPECIAL ELECTION FOR PROPOSED CHANGES TO THE RATE AND METHOD OF APPORTIONMENT OF THE EXISTING SPECIAL TAX OF CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH-FACILITIES).

A RESOLUTION OF CHANGE OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, DECLARING RESULTS OF SPECIAL ELECTION, DETERMINING THAT CHANGES TO THE RATE AND METHOD OF APPORTIONMENT OF THE EXISTING SPECIAL TAX OF CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH-FACILITIES) ARE LAWFULLY AUTHORIZED AND DIRECTING RECORDING OF AN AMENDMENT TO NOTICE OF SPECIAL TAX LIEN.

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, AMENDING AND RESTATING ORDINANCE NO. 3082 LEVYING SPECIAL TAXES WITHIN THE CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH-FACILITIES).

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, DEEMING IT NECESSARY TO AMEND RESOLUTION NO. 2017-124 IN ORDER TO

INCREASE THE MAXIMUM AGGREGATE AMOUNT OF BONDED INDEBTEDNESS THAT CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH-FACILITIES) IS AUTHORIZED TO INCUR.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, CALLING SPECIAL ELECTION FOR CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH-FACILITIES).

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, DECLARING RESULTS OF SPECIAL ELECTION OF COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH-FACILITIES).

ATTACHMENT: 20220419 CFD No. 35 Countryside Phase 2 So-Fac 01 RESO Calling Special^RM
ATTACHMENT: 20220419 CFD No. 35 Countryside Phase 2 So-Fac^01A EXH B RMA
ATTACHMENT: 20220419 CFD No. 35 Countryside Phase 2 So-Fac^02 RESO Declaring Results^RM
ATTACHMENT: 20220419 CFD No. 35 Countryside Phase 2 So-Fac^03 ORD^RM
ATTACHMENT: 20220419 CFD No. 35 Countryside Phase 2 So-Fac 04 RESO Deeming it Necessary to Incur RM
ATTACHMENT: 20220419 CFD No. 35 Countryside Phase 2 So-Fac 05 RESO Calling Special Election RM
ATTACHMENT: 20220419 CFD No. 35 Countryside Phase 2 So-Fac 06 RESO Declaring Results of Special Election^RM

18. A PUBLIC HEARING TO CONSIDER A RESOLUTION REGARDING THE FORMATION OF THE CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 63 (OLIVE AND OLEANDER); ADOPTION OF A RESOLUTION TO INCUR BONDED INDEBTEDNESS; AND INTRODUCTION OF AN ORDINANCE LEVYING SPECIAL TAXES

That the City Council consider and:

A. Adopt a resolution of formation of Community Facilities District No. 63 (Olive and Oleander), authorizing the levy of special taxes within the community facilities district, and establishing an appropriations limit for the community facilities district;
B. Adopt a resolution deeming it necessary to incur bonded indebtedness within Community Facilities District No. 63 (Olive and Oleander);
C. Adopt a resolution calling a special election for City of Ontario Community Facilities District No. 63 (Olive and Oleander);
D. Adopt a resolution declaring the results of the special election and directing the recording of a Notice of Special Tax Lien;
E. Introduce and waive further reading of an ordinance levying special taxes within City of Ontario Community Facilities District No. 63 (Olive and Oleander); and
F. Adopt a resolution authorizing the execution and delivery of an acquisition and funding agreement with Shea Homes Limited Partnership, a California limited partnership.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, OF

FORMATION OF THE CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 63 (OLIVE AND OLEANDER), AUTHORIZING THE LEVY OF A SPECIAL TAX.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, DEEMING IT NECESSARY TO INCUR BONDED INDEBTEDNESS WITHIN CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 63 (OLIVE AND OLEANDER).

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, CALLING SPECIAL ELECTION FOR CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 63 (OLIVE AND OLEANDER).

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, DECLARING RESULTS OF SPECIAL ELECTION AND DIRECTING RECORDING OF NOTICE OF SPECIAL TAX LIEN FOR CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 63 (OLIVE AND OLEANDER).

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, LEVYING SPECIAL TAXES WITHIN COMMUNITY FACILITY DISTRICT NO. 63 (OLIVE AND OLEANDER).

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, AUTHORIZING THE EXECUTION AND DELIVERY OF AN ACQUISITION AND FUNDING AGREEMENT WITH SHEA HOMES LP OF CALIFORNIA.

ATTACHMENT: 20220419 CFD No. 63 Olive and Oleander 01^RESO^Formation^RM
ATTACHMENT: 20220419 CFD No. 63 Olive and Oleander^01A EXH B RMA
ATTACHMENT: 20220419 CFD No. 63 Olive and Oleander 02^RESO Necessary to Incur^RM
ATTACHMENT: 20220419 CFD No. 63 Olive and Oleander 03^RESO Calling Special Election^RM
ATTACHMENT: 20220419 CFD No. 63 Olive and Oleander 04^RESO Declaring Election^RM
ATTACHMENT: 20220419 CFD No. 63 Olive and Oleander 05^ORD^RM

19. A PUBLIC HEARING TO CONSIDER A RESOLUTION APPROVING FILE NO. PSPA21-001, AN AMENDMENT TO THE PIEMONTE OVERLAY OF THE ONTARIO CENTER SPECIFIC PLAN, INCLUDING: (1) REVISING THE OVERLAY BOUNDARY, ADDING APPROXIMATELY 24.9 ACRES OF LAND LOCATED AT 4000 ONTARIO CENTER PARKWAY, TO THE OVERLAY AREA; (2) CHANGING THE LAND USE DESIGNATION ON APPROXIMATELY 4.9 ACRES OF LAND FROM OFFICE AND ENTERTAINMENT/RETAIL TO MIXED USE, WITHIN THE AREA BOUNDED BY FOURTH STREET TO THE NORTH, CONCOURS STREET AND ONTARIO CENTER PARKWAY TO THE SOUTH, VIA ALBA TO THE EAST, AND THE CAMDEN LANDMARK APARTMENTS AND VACANT LAND TO THE WEST; AND, (3) ESTABLISHING DEVELOPMENT STANDARDS AND DESIGN GUIDELINES FOR THE MIXED USE LAND USE AREA OF THE PIEMONTE OVERLAY AT ONTARIO CENTER SPECIFIC PLAN

That the City Council consider and adopt Resolutions approving the following:

A. The use of an Addendum to the Ontario Center Environmental Impact Report (State Clearing House No. 89041009); and
B. File No. PSPA21-001, an amendment to the Piemonte Overlay of The Ontario Center Specific Plan: (1) adding approximately 24.9 acres of land to the overlay area; (2) changing the land use designation on approximately 4.9 acres of land from office and entertainment/retail to mixed use; and, (3) establishing development standards and design guidelines for the Mixed Use land use area.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, APPROVING AN ADDENDUM TO THE ONTARIO CENTER SPECIFIC PLAN ENVIRONMENTAL IMPACT REPORT, PURSUANT TO THE REQUIREMENTS OF THE CALIFORNIA ENVIRONMENTAL QUALITY ACT, AS AMENDED, FOR FILE NO PSPA21-001.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, APPROVING FILE NO. PSPA21-001, AN AMENDMENT TO THE PIEMONTE OVERLAY AT THE ONTARIO CENTER SPECIFIC PLAN, [1] REVISING THE OVERLAY BOUNDARY TO ADD APPROXIMATELY 24.9 ACRES, COMPRISING OF THE PROPERTY LOCATED AT 4000 ONTARIO CENTER PARKWAY, TO THE OVERLAY AREA, [2] CHANGING THE LAND USE DESIGNATION ON APPROXIMATELY 4.9 ACRES OF LAND FROM OFFICE AND ENTERTAINMENT/RETAIL TO MIXED-USE, IN AN AREA BOUNDED BY FOURTH STREET TO THE NORTH, CONCOURS STREET AND ONTARIO CENTER PARKWAY TO THE SOUTH, VIA ALBA TO THE EAST, AND THE CAMDEN LANDMARK APARTMENTS AND VACANT LAND TO THE WEST, [3] ESTABLISH DEVELOPMENT STANDARDS AND DESIGN GUIDELINES FOR THE MIXED-USE LAND USE AREA WITHIN THE PIEMONTE OVERLAY AT ONTARIO CENTER SPECIFIC PLAN, AND MAKING FINDINGS IN SUPPORT THEREOF—APNS: 0210-204-12, 0210-204-13, 0210-204-14, 0210-204-15, 0210-204-17, 0210-204-18, 0210-204-20, 0210-204-21, 0210-204-22, 0210-204-23, 0210-204-23, 0210-204-24, 0210-204-25, 0210-204-26, 0210-204-28, 0210-204-36, 0210-204-37, 0210-204-37, 0210-204-38, 0210-204-39, 0210-204-40, 0210-204-41, 0210-531-06, 0210-531-07, 0210-531-08, 0210-531-09, 0210-531-10, 0210-231-11, 0210-231-12, 0210-231-13, 0210-231-14, 0210-231-15, 0210-231-16, 0210-205-01.

ATTACHMENT: 20220419 File No. PSPA21-001^01 Report Exhibits.docx
ATTACHMENT: 20220419 File No. PSPA21-001^02 PC Backup.pdf
ATTACHMENT: 20220419 File No. PSPA21-001^03 Addendum^RESO^RM
ATTACHMENT: 20220419 File No. PSPA21-001^04 Addendum.pdf
ATTACHMENT: 20220419 File No. PSPA21-001^05 Addendum-Traffic Impact Analysis.pdf
ATTACHMENT: 20220419 File No. PSPA21-001^06 Addendum-Air Quality and GHG.pdf
ATTACHMENT: 20220419 File No. PSPA21-001^07 Addendum-Energy Conservation.pdf
ATTACHMENT: 20220419 File No. PSPA21-001^08 Addendum-Noise Impact Study.pdf
ATTACHMENT: 20220419 File No. PSPA21-001^09 2016 Piemonte Overlay MND.pdf
ATTACHMENT: 20220419 File No. PSPA21-001^10^SPA^RM
ATTACHMENT: 20220419 File No. PSPA21-001^11 Attach A SPA Document.pdf

20. **A PUBLIC HEARING TO CONSIDER FILE NO. PCUP21-009, A CONDITIONAL USE PERMIT TO ESTABLISH A 128-ROOM LIMITED-SERVICE HOTEL ON 1.83 ACRES OF LAND LOCATED AT 5060 EAST FOURTH STREET, WITHIN THE FREEWAY COMMERCIAL LAND USE DISTRICT OF THE EXCHANGE SPECIFIC PLAN (APN: 0238-012-30)**

That the City Council consider and adopt a Resolution approving the Conditional Use Permit, File No. PCUP21-009, establishing a 128-room limited-service hotel located at 5060 East Fourth Street.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, APPROVING FILE NO. PCUP21-009, A CONDITIONAL USE PERMIT TO ESTABLISH AND OPERATE A 128-ROOM LIMITED-SERVICE HOTEL ON 1.83 ACRES OF LAND LOCATED AT 5060 EAST FOURTH STREET, WITHIN THE FREEWAY COMMERCIAL LAND USE DISTRICT OF THE EXCHANGE SPECIFIC PLAN AND MAKING FINDINGS IN SUPPORT THEREOF - APN: 0238-012-30.

ATTACHMENT: 20220419 File No. PCUP21-009 Extended Stay Hotel^01 PC BACKUP.pdf
ATTACHMENT: 20220405 File No. PCUP21-009 Extended Stay Hotel 02 RESO^RM
ATTACHMENT: 20220419 File No. PCUP21-009 Extended Stay Hotel^03 RES ATTACHMENT.pdf

ADMINISTRATIVE REPORTS/DISCUSSION/ACTION

21. **A RESOLUTION AUTHORIZING THE ISSUANCE OF CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 54 (ESPERANZA FACILITIES) SPECIAL TAX BONDS, SERIES 2022, IN AN AGGREGATE PRINCIPAL AMOUNT NOT TO EXCEED $8 MILLION AND RELATED MATTERS**

That the City Council consider and adopt a Resolution authorizing the issuance of City of Ontario Community Facilities District No. 54 (Esperanza Facilities) Special Tax Bonds, Series 2022.

A. Authorize the issuance of special tax bonds for public improvements required to facilitate the development of the Esperanza Facilities project and the Ontario Ranch development;
B. Approve the forms of the Indenture, the Bond Purchase Agreement, the Continuing Disclosure Agreement, and the Preliminary Official Statement;
C. Authorize a negotiated sale of the special tax bonds to Stifel, Nicolaus & Company, Incorporated (the "Underwriter") in accordance with the terms of the Bond Purchase Agreement; and
D. Authorize the execution of the Indenture, the Bond Purchase Agreement, the Continuing Disclosure Agreement, a deemed final certification in connection with the Preliminary Official Statement, a final Official Statement and other documents in connection with the issuance of the bonds by the City Manager or the other specified authorized officers.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA,

AUTHORIZING THE ISSUANCE OF CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 54 (ESPERANZA FACILITIES) SPECIAL TAX BONDS, SERIES 2022, IN AN AGGREGATE PRINCIPAL AMOUNT OF NOT TO EXCEED $8,000,000.00, AUTHORIZING THE EXECUTION AND DELIVERY OF AN INDENTURE, A BOND PURCHASE AGREEMENT, AND A CONTINUING DISCLOSURE AGREEMENT, AUTHORIZING THE DISTRIBUTION OF AN OFFICIAL STATEMENT IN CONNECTION THEREWITH AND AUTHORIZING THE EXECUTION OF NECESSARY DOCUMENTS AND CERTIFICATES AND RELATED ACTIONS.

ATTACHMENT: 20220419 CFD No. 54 Esperanza Facilities^01^RESO Authorizing Issuance of Bonds^RM
ATTACHMENT: 20220419 CFD No. 54 Esperanza Facilities^02 Indenture.doc
ATTACHMENT: 20220419 CFD No. 54 Esperanza Facilities^03 Bond Purchase Agreement
ATTACHMENT: 20220419 CFD No. 54 Esperanza Facilities^04 Continuing Disclosure Agreement.doc
ATTACHMENT: 20220419 CFD No. 54 Esperanza Facilities^05 Preliminary Official Statement.docx

STAFF MATTERS

City Manager Ochoa

COUNCIL MATTERS

Mayor Leon
Mayor Pro tem Wapner
Council Member Bowman
Council Member Dorst-Porada
Council Member Valencia

ADJOURNMENT

CITY OF ONTARIO
CLOSED SESSION REPORT
City Council // Housing Authority // Other // *(GC 54957.1)*
April 19, 2022

ROLL CALL: Wapner _, Bowman _, Dorst-Porada _, Valencia _, Mayor / Chairman Leon _.

STAFF: City Manager / Executive Director __, City Attorney __

In attendance: Wapner _, Bowman _, Dorst-Porada _,Valencia _, Mayor / Chairman Leon _.

- GC 54956.9 (d)(1), CONFERENCE WITH LEGAL COUNSEL-EXISTING LITIGATION Wendie Rios v. City of Ontario et al., Superior Court of California, County of San Bernardino Case No: CIVDS1828142

No Reportable Action	Continue	Approved
/ /	/ /	/ /

Disposition: _____

In attendance: Wapner _, Bowman _, Dorst-Porada _,Valencia _, Mayor / Chairman Leon _.

- GC 54956.8 CONFERENCE WITH REAL PROPERTY NEGOTIATORS Property: APN: 1048-562-01; 215 West C Street; City/Authority negotiator: Scott Ochoa, City Manager or his designee; Negotiating parties: United Christian Church of Hacienda Heights; Under negotiation: Price and Terms of Payment

No Reportable Action	Continue	Approved
/ /	/ /	/ /

Disposition: _____

Reported by:

_____
City Attorney / City Manager / Executive Director

ONTARIO CITY COUNCIL/
ONTARIO HOUSING AUTHORITY
MINUTES
MARCH 15, 2022
(Not official until approved)

JOINT MEETINGS

The regular meetings of the Ontario City Council and Housing Authority were held on Tuesday, March 15, 2022 at Ontario City Hall 303 E. B Street Ontario, California.

CALL TO ORDER

Mayor Leon called the Joint City Council and Ontario Housing Authority meetings to order at 6:32 p.m.

ROLL CALL

PRESENT:	Mayor/Chairman	Paul S. Leon
	Mayor pro Tem/Vice Chair	Alan D. Wapner
	Council/Authority Members:	Jim W. Bowman, Debra Dorst-Porada and Ruben Valencia
ABSENT:	Council/Authority Members:	None

Also present were City Manager / Executive Director Scott Ochoa, City Attorney/Legal Counsel Ruben Duran, and City Clerk/Secretary Sheila Mautz.

PLEDGE OF ALLEGIANCE

The Pledge of Allegiance was led by Council Member Bowman.

INVOCATION

The Invocation was led by Pastor Brian Chen, Great Commission Church.

Mayor Leon announced the City was successful in getting a $50,000 reward from the Governor's Office for the Jesus Sanchez homicide case.

PUBLIC COMMENTS

Two emailed comments were entered into the record as follows:

Item No. 12 written communications in opposition:
Aileen Ramos
Alexis Moreno

April Zazueta
Bianca Ruddy
Britney Becker
Christine Bennett
Cindy Ott
Delia Velez
Katia Hermosillo
Marisela Gutierrez
Matthew Waters
Miranda Delprino
Pollakriss Samuerphak
Stephanie Baker
Yesenia Zambrano

Item No. 14 Richard Barba in opposition.

Mayor Leon called upon the first speaker:

Armando Rodriguez, with the Ontario Hispanic Chamber of Commerce, invited City Council to upcoming events.

Randy Bekendem, spoke in support of keeping farmland in Ontario.

Lauren Bridges, spoke in opposition of warehouses.

Maria Raumaldo, requested support from residents in solving the Jesus Sanchez case.

Cassandra Sanchez, requested support from residents in solving the Jesus Sanchez case.

Margarita Leon, requested support from residents in solving the Jesus Sanchez case.

Stephanie Martinez, requested support from residents in solving the Jesus Sanchez case.

Damaris Lopez, requested support from residents in solving the Jesus Sanchez case.

Jesse Fonseca, spoke about the Ontario International Airport Authority finances.

AGENDA REVIEW/ANNOUNCEMENTS

City Manager Ochoa made no announcements.

CONSENT CALENDAR

MOTION: Moved by Council Member Dorst-Porada, seconded by Council Member Bowman and carried by unanimous vote 5-0, to approve the Consent Calendar as presented, with the exception of Item No. 14.

1. APPROVAL OF MINUTES

The City Council approved minutes for the regular meetings of the City Council and Housing Authority of February 15, 2022, approving the same as on file in the Records Management Department.

2. BILLS & PAYROLL

Approved Bills from February 11, 2022 through February 24, 2022 in the amount of $16,876,220.20 and Payroll February 11, 2022 through February 24, 2022 in the amount of $7,421,388.15, when audited by the Finance Committee.

3. ACCEPT A WRITTEN PETITION REQUESTING COMMENCEMENT OF CHANGE PROCEEDINGS TO CHANGE THE RATE AND METHOD OF APPORTIONMENT (RMA) OF THE EXISTING SPECIAL TAX OF CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH-FACILITIES); ADOPT A RESOLUTION OF CONSIDERATION TO CHANGE THE RMA OF THE EXISTING SPECIAL TAX AND ACCEPT A WRITTEN PETITION REQUESTING TO INCREASE THE MAXIMUM AGGREGATE AMOUNT OF BONDED INDEBTEDNESS OF COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH-FACILITIES) THAT IS AUTHORIZED TO INCUR TO $42,000,000; ADOPT A RESOLUTION OF INTENTION TO AMEND RESOLUTION NO. 2017-124 IN ORDER TO INCREASE THE MAXIMUM AGGREGATE AMOUNT OF BONDED INDEBTEDNESS

The City Council considered and:

A. Accepted a written petition requesting commencement of change proceedings from Lennar Homes of California, LLC (“Lennar”), to consider a change to the Rate and Method of Apportionment of the existing special tax of the City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South-Facilities) (the “CFD”) and waived certain procedural matters, under the Mello-Roos Community Facilities Act of 1982 (the “Act”);
B. Adopted a Resolution of Consideration to change the Rate and Method of Apportionment of the existing special tax of the CFD and set a public hearing on such proposed change as part of the regularly scheduled City Council meeting on Tuesday, April 19, 2022; and
C. Accepted a written petition requesting commencement of proceedings from Lennar to increase the maximum aggregate amount of bonded indebtedness that the CFD is authorized to incur to $42,000,000 and waive certain procedural matters, under the Act; and

D. Adopted a Resolution of Intention to amend Resolution No. 2017-124 in order to increase the maximum aggregate amount of bonded indebtedness that the CFD is authorized to incur and set a public hearing on such proposed increase as part of the regularly scheduled City Council meeting on Tuesday, April 19, 2022.

RESOLUTION NO. 2022-017 A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, OF CONSIDERATION TO CHANGE THE RATE AND METHOD OF APPORTIONMENT OF THE EXISTING SPECIAL TAX OF CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH - FACILITIES).

RESOLUTION NO. 2022-018 A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, OF INTENTION TO AMEND RESOLUTON NO. 2017-124 IN ORDER TO INCREASE THE MAXIMUM AGGREGATE AMOUNT OF BONDED INDEBTEDNESS THAT CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH - FACILITIES) IS AUTHORIZED TO INCUR.

4. ACCEPTANCE OF A WRITTEN PETITION TO CREATE A COMMUNITY FACILITIES DISTRICT; A RESOLUTION OF INTENTION TO ESTABLISH CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 63 (OLIVE AND OLEANDER FACILITIES) AND TO AUTHORIZE THE LEVY OF SPECIAL TAXES; AND A RESOLUTION TO INCUR BONDED INDEBTEDNESS

The City Council considered and:

A. Accepted a written petition from Shea Homes Limited Partnership, to create a Community Facilities District, and to waive certain procedural matters under the Mello-Roos Community Facilities Act of 1982;
B. Adopted a Resolution of Intention to establish City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities) (the "CFD") and authorized the associated levy of special taxes therein; and set a public hearing for the formation of the CFD as part of the regularly scheduled City Council meeting on Tuesday, April 19, 2022; and
C. Adopted a Resolution to Incur Bonded Indebtedness of proposed Community Facilities District No. 63 (Olive and Oleander Facilities)

RESOLUTION NO. 2022-019 A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, OF INTENTION TO ESTABLISH A COMMUNITY FACILITIES DISTRICT, PROPOSED TO BE NAMED CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 63 (OLIVE AND OLEANDER FACILITIES), AND TO AUTHORIZE THE LEVY OF SPECIAL TAXES.

RESOLUTION NO. 2022-020 A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, TO INCUR BONDED INDEBTEDNESS OF THE

PROPOSED CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 63 (OLIVE AND OLEANDER FACILITIES).

5. AN AMENDMENT TO THE GOODS AND SERVICES AGREEMENT WITH MYERS & SONS HI-WAY SAFETY INC. FOR PROCUREMENT OF TRAFFIC CONTROL DEVICES AND MATERIALS

The City Council approved and authorized the City Manager to execute Amendment No. 2 to the Goods and Services Agreement with Myers & Sons Hi-Way Safety Inc. of Chino, California, for procurement of traffic control devices and materials in the amount of $25,000, for a revised not to exceed amount of $196,000.

6. AUTHORIZE A SOLE SOURCE VENDOR TO PROVIDE A CUSTOM DESIGNED FIREWORKS SHOW FOR THE ANNUAL INDEPENDENCE DAY CELEBRATION

The City Council authorized and approved a sole source vendor to provide a pyrotechnic custom designed fireworks show for the annual Independence Day celebration.

7. PRE-AUTHORIZED LIST OF VENDORS TO PROVIDE SPECIALIZED EQUIPMENT, SERVICES, AND TRAINING FOR THE POLICE DEPARTMENT

The City Council approved a list of pre-authorized vendors to provide Specialized Equipment, services, and training for the Ontario Police Department.

8. AN AMENDMENT TO THE PROFESSIONAL SERVICES AGREEMENT WITH HARRIS AND ASSOCIATES FOR ON-CALL ENGINEERING PLAN CHECK SERVICES

The City Council approved an Amendment to the Professional Services Agreement with Harris and Associates, of Irvine, California, to provide on-call Plan Checking Services for a revised total annual authorized expenditure of $2,600,000 in FY2021-22 and $2,080,000 in FY2022-23, with a revised overall contract not-to-exceed amount of $5,400,000.

9. 2021 GENERAL PLAN ANNUAL PROGRESS REPORT AND 2021 HOUSING ELEMENT ANNUAL PROGRESS REPORT

The City Council considered and adopted a Resolution authorizing Staff to transmit the 2021 General Plan Annual Performance Report, which includes the 2021 Housing Element Annual Progress Report, to the California Department of Housing and Community Development and the Governor's Office of Planning and Research.

RESOLUTION NO. 2022-021 A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, APPROVING THE 2021 GENERAL PLAN ANNUAL PROGRESS REPORT (FILE NO. PADV22-001), WHICH INCLUDES THE HOUSING ELEMENT ANNUAL PROGRESS REPORT, AND AUTHORIZING

STAFF TO SUBMIT THE REPORTS TO THE CALIFORNIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT AND THE GOVERNOR'S OFFICE OF PLANNING AND RESEARCH.

10. A RESOLUTION OPPOSING INITIATIVE 21-0042A.

The City Council adopted a Resolution to Oppose Initiative 21-0042A.

RESOLUTION NO. 2022-022 A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, OPPOSING INITIATIVE 21-0042A, A TAXPAYER PROTECTION AND GOVERNMENT ACCOUNTABILITY ACT FILED BY THE CALIFORNIA BUSINESS ROUNDTABLE.

11. ORDINANCES APPROVING A ZONE CHANGE (FILE NO. PZC21-002) MODIFYING THE OFFICIAL ZONING MAP TO ESTABLISH AN "AH" (AFFORDABLE HOUSING) OVERLAY ZONING DISTRICT AND A DEVELOPMENT CODE AMENDMENT (FILE NO. PDCA21-001) REVISING SECTION 6.01.035 FOR THE PURPOSE OF ADDING PROVISIONS TO ESTABLISH AN "AH" (AFFORDABLE HOUSING) OVERLAY DISTRICT

The City Council considered and adopted the following:

A. An Ordinance approving a Zone Change, File No. PZC21-002, revising the Zoning Map to establish the "AH" (Affordable Housing) Overlay zoning district; and
B. An Ordinance approving a Development Code Amendment, File No. PDCA21-001, adding a provision to establish the "AH" (Affordable Housing) Overlay zoning district.

Introduction of the Ordinances below took place at a regular meeting of the City Council on March 1, 2022.

ORDINANCE NO. 3204 AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, APPROVING FILE NO. PZC21-002, A ZONE CHANGE TO MODIFY THE ZONING MAP TO ESTABLISH THE AH (AFFORDABLE HOUSING) ZONING OVERLAY DISTRICT, AND MAKING FINDINGS IN SUPPORT THEREOF.

ORDINANCE NO. 3205 AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, APPROVING FILE NO. PDCA21-001, A DEVELOPMENT CODE AMENDMENT REVISING SECTION 6.01.035, ADDING PROVISIONS TO ESTABLISH THE AH (AFFORDABLE HOUSING) OVERLAY DISTRICT, AND MAKING FINDINGS IN SUPPORT THEREOF.

12. AN ORDINANCE ADOPTING THE SOUTH ONTARIO LOGISTICS CENTER SPECIFIC PLAN (FILE NO. PSP19-001), ESTABLISHING THE LAND USE DISTRICTS, DEVELOPMENT STANDARDS, DESIGN GUIDELINES, AND INFRASTRUCTURE IMPROVEMENTS FOR THE POTENTIAL DEVELOPMENT OF UP TO 5,333,518 SQUARE FEET OF INDUSTRIAL AND BUSINESS PARK LAND USES. THE PROJECT SITE IS BORDERED BY EUCALYPTUS AVENUE ON THE NORTH, MERRILL AVENUE ON THE SOUTH, EXISTING RIGHT-OF-WAY FOR THE FUTURE CAMPUS AVENUE EXTENSION ON THE WEST, AND GROVE AVENUE ON THE EAST (APNS: 1054-071-01, 1054-071-02, 1054-081-03, 1054-091-01, 1054-091-02, 1054-101-01, 1054-101-02, 1054-231-01, 1054-231-02, 1054-241-01, 1054-241-02, 1054-321-01, 1054-321-02, 1054-311-01, 1054-311-02, 1054-051-01, 1054-051-02, 1054-061-01, 1054-061-02, 1054-251-01, 1054-251-02, 1054-301-01, AND 1054-301-02

The City Council considered and approved the Ordinance adopting the South Ontario Logistics Center Specific Plan (File No. PSP19-001). Introduction took place at a regular meeting of the City Council on March 1, 2022.

ORDINANCE NO. 3206 AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, APPROVING FILE NO. PSP19-001, THE SOUTH ONTARIO LOGISTICS CENTER SPECIFIC PLAN, TO ESTABLISH LAND USE DISTRICTS, DEVELOPMENT STANDARDS, DESIGN GUIDELINES, AND INFRASTRUCTURE IMPROVEMENTS FOR THE POTENTIAL DEVELOPMENT OF UP TO 5,333,518 SQUARE FEET OF INDUSTRIAL AND BUSINESS PARK LAND USES ON 219.39 ACRES OF LAND GENERALLY BORDERED BY EUCALYPTUS AVENUE ON THE NORTH, MERRILL AVENUE ON THE SOUTH, GROVE AVENUE ON THE EAST, AND CAMPUS AVENUE ON THE WEST, AND MAKING FINDINGS IN SUPPORT THEREOF—APNS: 1054-071-01, 1054-071-02, 1054-081-03, 1054-091-01, 1054-091-02, 1054-101-01, 1054-101-02, 1054-231-01, 1054-231-02, 1054-241-01, 1054-241-02, 1054-321-01, 1054-321-02, 1054-311-01, 1054-311-02, 1054-051-01, 1054-051-02, 1054-061-01, 1054-061-02, 1054-251-01, 1054-251-02, 1054-301-01, AND 1054-301-02.

13. AMENDMENT TO AN ARCHITECTURAL SERVICES AGREEMENT WITH HOLT ARCHITECTS, INC. FOR THE POLICE DEPARTMENT HEADQUARTERS IMPROVEMENT PROJECT

The City Council authorized the City Manager to execute an amendment to the existing Architectural Services Agreement with Holt Architects, Inc. of Riverside California for the Police Department Headquarters Improvement Project in the amount of $91,436 for a total contract value of $230,822. The Architectural Services Agreement and proposed amendment are on file with the Records Management Department.

ITEMS PULLED FROM THE AGENDA: Council Member Valencia pulled Item No. 14 for a separate discussion.

14. REQUEST BY FOGLESONG TOWING & STORAGE INC. FOR THE ONTARIO CITY COUNCIL'S CONSENT TO TRANSFER ITS TOWING CONTRACT TO BENDITO CIELO, INC.

Council Member Valencia asked the City Attorney if Mayor Leon should recuse himself from the item.

Mayor Leon stated he had no conflict and called upon Laura Acosta to speak.

Public Comment:

Laura Acosta, introduced herself as the owner of Bendito Cielo, gave a brief background on her experience, and thanked Council for their consideration.

MOTION: Moved by Council Member Dorst-Porada, seconded by Council Member Bowman and carried by a vote of 4-1-0, with Council Member Valencia in opposition, to approve Foglesong Towing & Storage, Inc.'s request to transfer its towing contract to Bendito Cielo, Inc.

PUBLIC HEARINGS

15. A PUBLIC HEARING TO CONSIDER AN APPEAL OF THE PLANNING COMMISSION'S DECISION TO APPROVE THE USE OF AN ADDENDUM TO THE ONTARIO PLAN ENVIRONMENTAL IMPACT REPORT (STATE CLEARINGHOUSE NO. 2008101140), A TENTATIVE PARCEL MAP NO. 20147 (FILE NO. PMTT21-010), SUBDIVIDING 95.35 ACRES OF LAND INTO THREE PARCELS, AND A DEVELOPMENT PLAN (FILE NO. PDEV21-018) TO CONSTRUCT TWO INDUSTRIAL BUILDINGS TOTALING 168,722 SQUARE FEET ON 13.07 ACRES OF LAND GENERALLY LOCATED AT THE SOUTHEAST CORNER OF JURUPA STREET AND MILLIKEN AVENUE, AT 1425 SOUTH TOYOTA WAY, WITHIN THE INDUSTRIAL MIXED USE AND WAREHOUSE/DISTRIBUTION LAND USE DISTRICTS OF THE TOYOTA ONTARIO BUSINESS PARK SPECIFIC PLAN (APN: 0238-121-75).

The City Council considered and adopted Resolutions upholding the Planning Commission's approval of the use of an Addendum to The Ontario Plan Environmental Impact Report (State Clearinghouse No. 2008101140), Tentative Parcel Map No. 20147 (File No. PMTT21-010) and Development Plan (File No. PDEV21-018), and denied the appeal.

RESOLUTION NO. 2022-023 A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, DENYING THE APPEAL OF THE PLANNING COMMISSION'S DECISION TO APPROVE THE USE OF AN ADDENDUM TO THE ONTARIO PLAN ENVIRONMENTAL IMPACT REPORT PURSUANT TO THE

REQUIREMENTS OF THE CALIFORNIA ENVIRONMENTAL QUALITY ACT, AS AMENDED, FOR FILE NOS. PMTT21-010 AND PDEV21-018.

RESOLUTION NO. 2022-024 A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, DENYING THE APPEAL OF THE PLANNING COMMISSION'S DECISION TO APPROVE TENTATIVE PARCEL MAP NO. 20147 (FILE NO. PMTT21-010), SUBDIVIDING 95.35 ACRES OF LAND INTO THREE PARCELS TO FACILITATE THE DEVELOPMENT OF TWO INDUSTRIAL BUILDINGS AND ASSOCIATED SITE IMPROVEMENTS, AND MAKING FINDINGS IN SUPPORT THEREOF—APN: 0238-121-75.

RESOLUTION NO. 2022-025 A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, DENYING THE APPEAL OF THE PLANNING COMMISSION'S DECISION TO APPROVE FILE NO. PDEV21-018, A DEVELOPMENT PLAN TO CONSTRUCT TWO INDUSTRIAL BUILDINGS TOTALING 168,772 SQUARE FEET AND ASSOCIATED SITE IMPROVEMENTS ON 13.07 ACRES OF LAND LOCATED AT THE SOUTHEAST CORNER OF JURUPA STREET AND MILLIKEN AVENUE, AT 1425 SOUTH TOYOTA WAY, AND MAKING FINDINGS IN SUPPORT THEREOF—APN: 0238-121-75.

Notice of public hearing has been duly given and affidavits of compliance are on file in the Records Management Department.

There were two written communications from Amalia Bowley who wrote in opposition.

Mayor Leon opened the public hearing asking those persons interested in this item to speak.

Amalia Bowley, spoke in opposition to the item.

City Attorney Duran indicated that counsel reviewed the points raised by Ms. Bowley and she did not properly present before the Council for an appeal. He also stated that the cited cases do not apply andrecommended she review CEQA guidelines. City Attorney Duran noted there were no appeals before the Planning Commission, as a result the Council does not have a basis to grant the appeal.

Hearing no one else wishing to speak, Mayor Leon opened the item for Council discussion and closed the public hearing.

MOTION: Moved by Council Member Wapner, seconded by Council Member Dorst Porada and carried by unanimous vote of 5-0 to uphold the Planning Commission's decision and adopting Resolution Nos. 2022-023, 2022-024, and 2022-025.

16. A PUBLIC HEARING TO CONSIDER THE ARTS DISTRICT WEST PLANNED UNIT DEVELOPMENT (FILE NO. PUD22-001), ESTABLISHING DEVELOPMENT STANDARDS, DESIGN GUIDELINES AND INFRASTRUCTURE REQUIREMENTS TO FACILITATE A COMMERCIAL DEVELOPMENT ON 0.86-ACRE OF LAND LOCATED AT 125 WEST EMPORIA STREET, WITHIN THE MU-1/LUA-2N (DOWNTOWN MIXED-USE/ARTS DISTRICT - NORTH) AND EA (EUCLID AVENUE OVERLAY) ZONING DISTRICTS (APN: 1049-059-14)

The City Council considered and waived further reading of an ordinance approving the Arts District West Planned Unit Development, File No. PUD22-001, establishing development standards, design guidelines, and infrastructure requirements to facilitate a commercial development at 125 West Emporia Street.

ORDINANCE NO. 3207 (FIRST READING) AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, APPROVING FILE NO. PUD22-001, THE ARTS DISTRICT WEST PLANNED UNIT DEVELOPMENT, ESTABLISHING DEVELOPMENT STANDARDS, DESIGN GUIDELINES, AND INFRASTRUCTURE REQUIREMENTS FOR 0.86-ACRE OF LAND LOCATED AT 125 WEST EMPORIA STREET, WITHIN MU-1/LUA-2N (DOWNTOWN MIXED-USE/ARTS DISTRICT – NORTH) AND EA (EUCLID AVENUE OVERLAY) ZONING DISTRICTS, AND MAKING FINDINGS IN SUPPORT THEREOF—APN: 1049-059-14.

Notice of public hearing has been duly given and affidavits of compliance are on file in the Records Management Department. There were no written communications.

Mayor Leon opened the public hearing asking those persons interested in this item to speak. Hearing no one wishing to speak, Mayor Leon opened the item for Council discussion, after which he closed the public hearing.

MOTION: Moved by Council Member Bowman seconded by Council Member Dorst-Porada and carried by unanimous vote to introduce Ordinance No. 3207.

STAFF MATTERS

City Manager Ochoa made no comments.

COUNCIL MATTERS

Council Member Valencia thanked Council Member Dorst-Porada and Assembly Member Freddie Rodriguez who authored a letter to Governor Newsom requesting additional reward funds to solve the Jesus Sanchez case.

Council Member Bowman noted he attended Top Golf's Grand Opening and expressed his gratitude for all participating partners.

Mayor pro Tem Wapner spoke on his father-in-law, Alejo Vasquez's passing and asked if the meeting could be adjourned in his memory.

Council Member Dorst-Porada thanked staff for their work on the Robert Lynn Nelson reception and show.

Mayor Leon expressed his condolences to the Ovitt family due to Leah Dingman's passing and added the meeting would also be adjourned in her memory.

ADJOURNMENT

Mayor Leon adjourned the meetings of the Joint Agencies at 7:31 p.m. in memory of Alejo Vasquez and Leah Dingman and announced the next regular meeting to be held on Tuesday, April 5, 2022.

Respectfully submitted,

_____
SHEILA MAUTZ, CITY CLERK/SECRETARY

APPROVED:

_____
PAUL S. LEON, MAYOR/CHAIRMAN

CITY OF ONTARIO *Agenda Report* **April 19, 2022**	**SECTION:** **CONSENT CALENDAR**
Department: Engineering Prepared By: Tricia Espinoza Department: Engineering Prepared By: Craig Cruz Staff Member Presenting: Scott Murphy, Executive Director Community Development Reviewed By: Khoi Do Approved By:	Submitted To: Council/OHA Approved: _____ Continued To: _____ Denied: _____ Item No: 3

SUBJECT: **RESOLUTIONS DEDICATING RIGHT-OF-WAY EASEMENTS FOR PUBLIC ROAD AND UTILITY PURPOSES OVER A PORTION OF CITY-OWNED PARCELS AT BUDD STREET AND FERN AVENUE, MAITLAND STREET AND BON VIEW AVENUE, AND WALNUT STREET AND CAMPUS AVENUE**

RECOMMENDATION: That the City Council consider and adopt three Resolutions dedicating right-of-way easements for public road and utility purposes over a portion of City-owned parcels at Budd Street and Fern Avenue (APN: 1050-051-31, 32, 33), Maitland Street and Bon View Avenue (APN: 1049-451-01, 02, 24), and Walnut Street and Campus Avenue (APN: 1051-381-06); and authorize the City Manager or his designee to execute the easement deeds.

THE FOLLOWING COUNCIL GOALS ARE BEING ACHIEVED:
Focus Resources in Ontario's Commercial and Residential Neighborhoods
Invest in the City's Infrastructure (Water, Streets, Sewers, Parks, Storm Drains and Public Facilities)

FISCAL IMPACT: There is no direct fiscal impact associated with this action. Costs associated with the preparation of the legal documents are included in the approved project budgets.

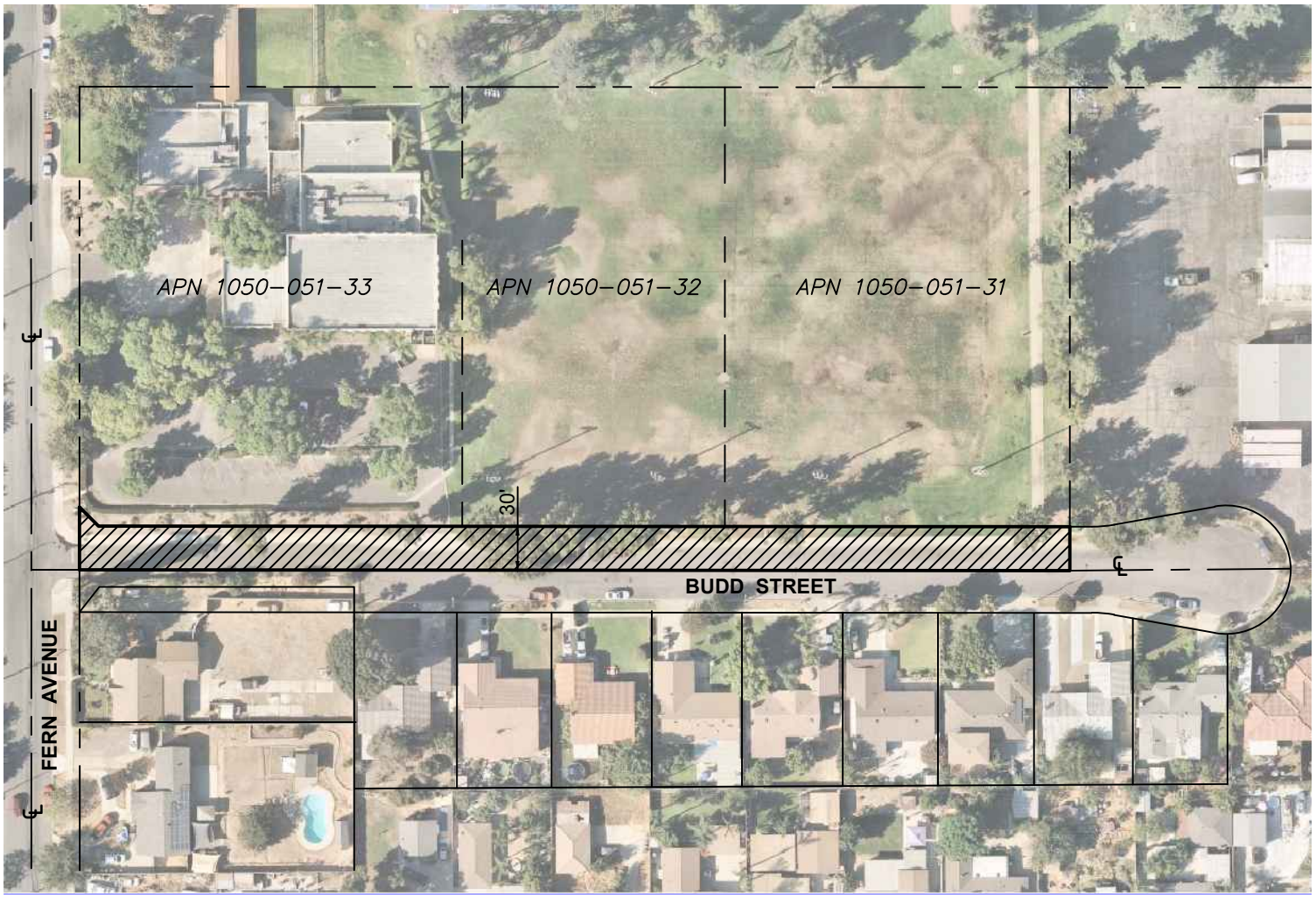
BACKGROUND & ANALYSIS: State law generally requires public streets to be within rights-of-way that have been dedicated for public road and utility purposes. These right-of-way transactions are related to Active Transportation Program (ATP) and traffic projects in various stages of construction.

The City owns parcels of land at the northeast corner of Budd Street and Fern Avenue (De Anza Park, Community & Teen Center); the southwest corner of Maitland Street and Bon View Avenue (Bon View Park); and the southeast corner of Walnut Street and Campus Avenue (Kimball Community Park), over which street improvements, including curb, sidewalk and landscaping currently exist. However, these existing street improvements were built within the parcel's boundaries rather than upon dedicated public rights-of-way. It is in the City's best interest to

dedicate affected portions of these parcels for roadway purposes. The current uses on the parcels will neither change nor be impacted by the dedication.

Portions of the City-owned properties will be dedicated as right-of-way easements as shown in Exhibits 1-3 and set forth in the proposed Resolutions. The Resolutions authorize the execution of an easement deed that will ensure that San Bernardino County assessor maps will be updated to reflect the City's ultimate right-of-way needs.

The easement deeds have been reviewed and approved as to form by the City Attorney.



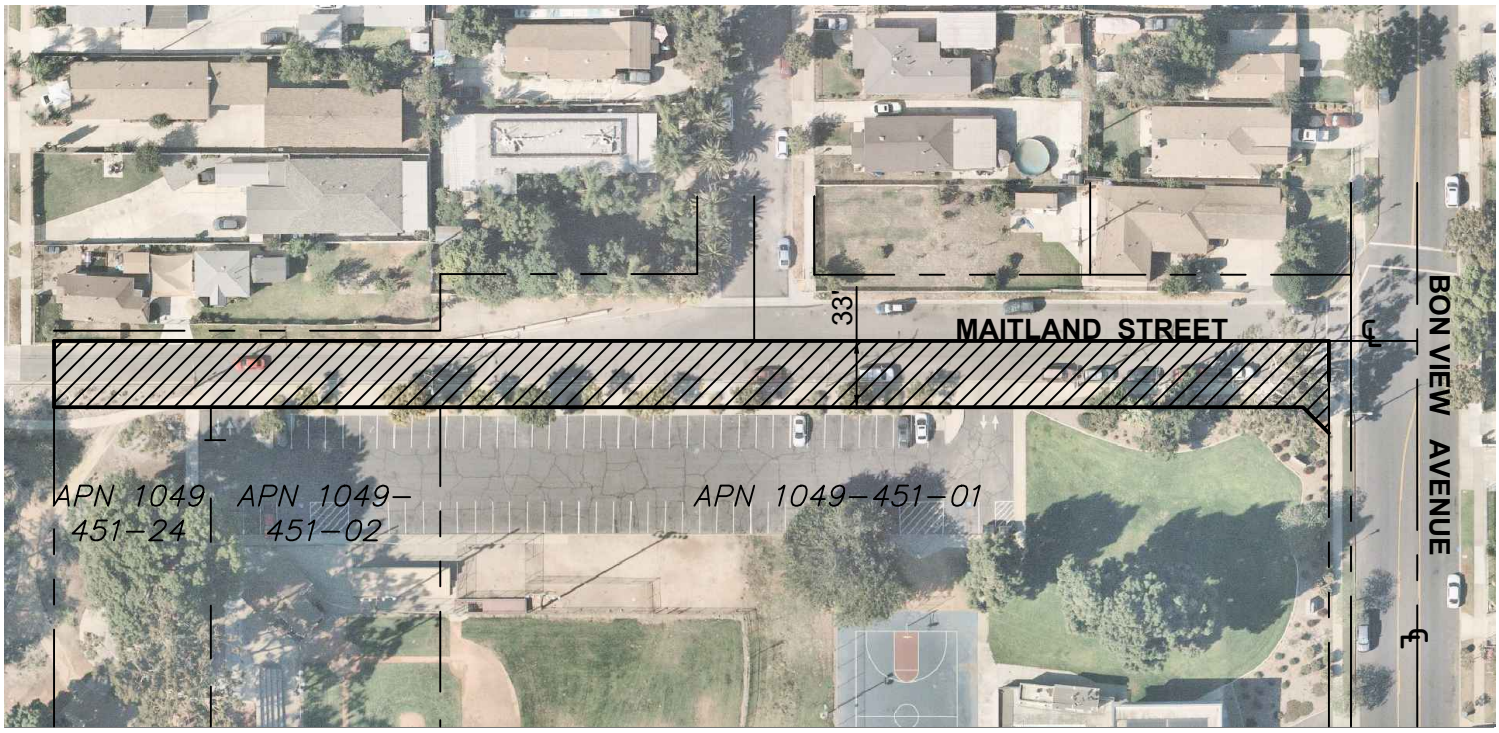
LEGEND

AREA TO BE DEDICATED FOR PUBLIC ROAD AND PUBLIC UTILITY PURPOSES

CITY OF ONTARIO

EXHIBIT 1

1" = 120'



LEGEND

AREA TO BE DEDICATED FOR PUBLIC ROAD AND PUBLIC UTILITY PURPOSES

CITY OF ONTARIO

EXHIBIT 2

1" = 100'

30

LEGEND

AREA TO BE DEDICATED FOR PUBLIC ROAD AND PUBLIC UTILITY PURPOSES

CITY OF ONTARIO

EXHIBIT 3

1" = 100'

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, DEDICATING A RIGHT-OF-WAY EASEMENT FOR PUBLIC ROAD AND UTILITY PURPOSES OVER A PORTION OF CITY-OWNED PARCELS (DE ANZA PARK, COMMUNITY & TEEN CENTER) AT BUDD STREET AND FERN AVENUE – APN: 1050-051-31, 32, 33.

WHEREAS, in accordance with the City's Master Plan of Streets and Highways, the existing City owned street at the northeast corner of parcels (APN: 1050-051-31, 32, 33) along Budd Street and Fern Avenue requires additional public street right-of-way width; and

WHEREAS, the City has all rights, title and interest to the parcels situated on the northeast corner of Budd Street and Fern Avenue as depicted on Exhibits "A" and "B" of the easement deed, from which necessary street right-of-way can be provided; and

WHEREAS, under state law, in order to improve a public road, the law generally requires a right-of-way dedication of property by its owner and acceptance by the City; and

WHEREAS, the City now seeks to dedicate a portion of said City-owned corner parcel as a right-of-way and utility easement; and

WHEREAS, the City Council now seeks to approve the use of the City's property for this desired purpose in order to achieve the ultimate right-of-way required to accommodate City's long-term transportation needs.

NOW, THEREFORE, BE IT RESOLVED, by the City Council of the City of Ontario, California:

1. The City Council of the City of Ontario hereby dedicates as an easement for public road and utility purposes, the property as depicted in the attached easement deed.

2. The City Clerk shall cause the attached easement deeds, attested by the City Clerk under seal, to be executed and recorded in the office of the recorder of the County of San Bernardino. An additional purpose for the easement deed is to ensure that future County assessor maps reflect this new expanded right-of-way dedicated for roadway and utility purposes.

3. The City Manager is authorized to execute the attached easement deed for the purposes stated herein.

The City Clerk of the City of Ontario shall certify as to the adoption of this Resolution.

PASSED, APPROVED AND ADOPTED this 19th day of April 2022.

_____
PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO LEGAL FORM:

_____
BEST, BEST & KREIGER, LLP
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. 2022- was duly passed and adopted by the City Council of the City of Ontario at their regular meeting held April 19, 2022 by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

The foregoing is the original of Resolution No. 2022- duly passed and adopted by the Ontario City Council at their regular meeting held April 19, 2022.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

Atlas Sheet:_____
File:_____
Prepared By:_____
Checked By:_____
No. of Parcels Involved: _____
Assessor's Parcel #:_____

Recording requested by City of Ontario,
and when recorded mail to:

City Clerk
City of Ontario
303 East "B" Street
Ontario, CA 91764

EXEMPT RECORDING FEES GOVERNMENT CODE SECTION 6103 & 27383 (SPACE ABOVE THIS LINE FOR RECORDER'S USE)

EASEMENT DEED OF RIGHT-OF-WAY DEDICATION

CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA

CITY OF ONTARIO, A MUNICIPAL CORPORATION

GRANTOR(S)

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged, Grantor(s) hereby grant(s) to the City of Ontario, a political subdivision of the State of California, for public street and public utilities purposes, a right-of-way easement in, over, under, upon, and across all that real property situated in the City of Ontario, County of San Bernardino, State of California, described as follows:

SEE ATTACHED EXHIBITS A AND B

SIGNATURE(S) OF GRANTOR(S) ***(NOTE: ATTACH NOTARY ACKNOWLEDGMENT)***

FULL NAME OF CORPORATION: City of Ontario, a Municipal Corporation

Scott Ochoa, City Manager

Print Name and Title _____ Signature and Date _____

Print Name and Title _____ Signature and Date _____

Print Name and Title _____ Signature and Date _____

This is to certify that the interest in real property conveyed by the within instrument to the City of Ontario, California ("Grantee"), a municipal corporation, is hereby accepted by the undersigned officer pursuant to authority conferred by Resolution 2007-148 of the City Council adopted on December 18th, 2007, and the Grantee consents to the recordation thereof by its duly authorized officer.

CITY OF ONTARIO: _____
Khoi Do P.E. / City Engineer / Date

ATTEST: _____
City Clerk

EXHIBIT "A"

LEGAL DESCRIPTION

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, BEING A PORTION OF LOT 4 OF SECTION 31, TOWNSHIP 1 SOUTH, RANGE 7 WEST AS SHOWN ON THE MAP OF SUBDIVISION OF PART OF RANCHO SANTA ANA DEL CHINO, RECORDED IN BOOK 6, PAGE 15 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF THE LAND DESCRIBED IN THE GRANT DEED RECORDED DECEMBER 4, 1963 IN BOOK 6041, PAGE 441, OF OFFICIAL RECORDS, IN THE OFFICE OF SAID COUNTY RECORDER, SAID CORNER BEING ON THE SOUTHERLY LINE OF SAID LOT 4;

THENCE ALONG THE WESTERLY BOUNDARY OF SAID GRANT DEED NORTH 00°01'00" WEST 30.00 FEET TO A LINE PARALLEL WITH AND 30.00 FEET NORTHERLY OF SAID SOUTHERLY LINE;

THEN ALONG SAID PARALLEL LINE SOUTH 89°38'30" WEST 663.59 FEET TO A LINE PARALLEL WITH AND 13.00 FEET EASTERLY OF THE EASTERLY RIGHT-OF-WAY OF FERN AVENUE (33.00 FOOT HALF-WIDTH) AS SHOWN ON TRACT NO. 2711, RECORDED IN BOOK 43, PAGE 70 OF MAPS, IN THE OFFICE OF SAID COUNTY RECORDER;

THENCE NORTH 45°11'21 WEST 18.33 FEET TO A POINT IN SAID EASTERLY RIGHT-OF-WAY, SAID POINT BEING 43.00 FEET NORTHERLY OF SAID SOUTHERLY LINE OF LOT 4, AS MEASURED ALONG SAID RIGHT-OF-WAY;

THENCE ALONG SAID RIGHT-OF-WAY SOUTH 00°01'00" EAST 43.00 FEET TO SAID SOUTHERLY LINE;

THENCE ALONG SAID SOUTHERLY LINE NORTH 89°38'30 EAST 676.59 FEET TO THE POINT OF BEGINNING.

THE ABOVE DESCRIBED PARCEL OF LAND CONTAINS 20,382 SQUARE FEET (0.4679 ACRES), MORE OR LESS.

ALL AS SHOWN ON EXHIBIT "B" ATTACHED HERETO AND MADE A PART THEREOF.

THIS REAL PROPERTY DESCRIPTION HAS BEEN PREPARED BY ME, OR UNDER MY DIRECTION, IN CONFORMANCE WITH THE PROFESSIONAL LAND SURVEYOR'S ACT.

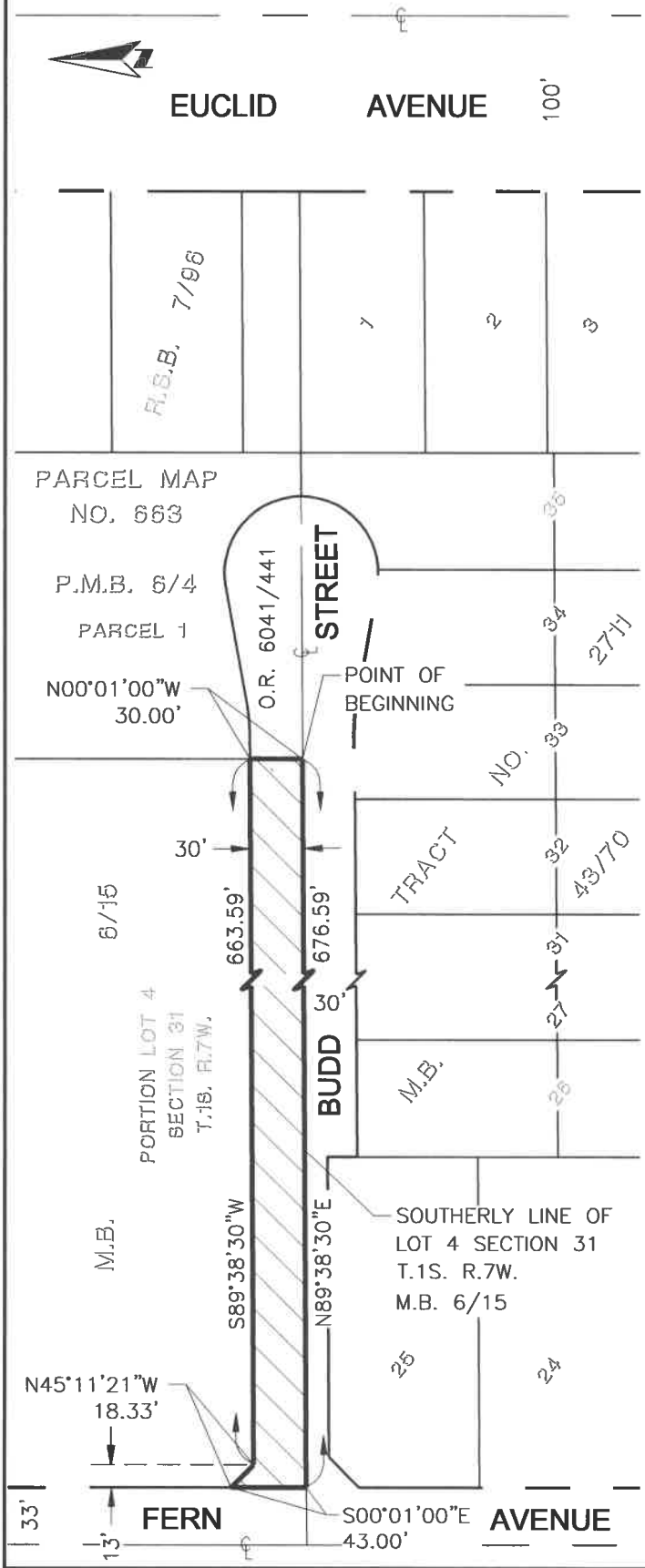
PATRICK D. EARL, P.L.S. 8773 (CA) — 03/30/2022 DATE
THIS DOCUMENT IS PRELIMINARY UNLESS SIGNED

LICENSED LAND SURVEYOR
PATRICK DENNIS EARL
NO. 8773
STATE OF CALIFORNIA

0' 50' 100'
SCALE: 1"=100'

EXHIBIT "B"

PLAT TO ACCOMPANY LEGAL DESCRIPTION



LEGEND

BOUNDARY OF DESCRIPTION
AREA OF DESCRIPTION - 20,382 S.F.±
CENTERLINE

03/30/2022
PATRICK D. EARL, P.L.S. 8773 (CA) DATE
THIS DOCUMENT IS PRELIMINARY UNLESS SIGNED

LICENSED LAND SURVEYOR
PATRICK DENNIS EARL
NO. 8773
STATE OF CALIFORNIA

KDM MERIDIAN, INC. - 1340 REYNOLDS AVE., STE. 110 - IRVINE, CA. 92614 - PH. (949)768-0731

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, DEDICATING A RIGHT-OF-WAY EASEMENT FOR PUBLIC ROAD AND UTILITY PURPOSES OVER A PORTION OF CITY-OWNED PARCELS (BON VIEW PARK) AT MAITLAND STREET AND BON VIEW AVENUE – APN: 1049-451-01, 02, 24.

WHEREAS, in accordance with the City's Master Plan of Streets and Highways, the existing City owned street at the southwest corner of parcels (APN: 1049-451-01, 02, 24) along Maitland Street and Bon View Avenue requires additional public street right-of-way width; and

WHEREAS, the City has all rights, title and interest to the parcels situated on the southwest corner of Maitland Street and Bon View Avenue as depicted on Exhibits "A" and "B" of the easement deed, from which necessary street right-of-way can be provided; and

WHEREAS, under state law, in order to improve a public road, the law generally requires a right-of-way dedication of property by its owner and acceptance by the City; and

WHEREAS, the City now seeks to dedicate a portion of said City-owned corner parcel as a right-of-way and utility easement; and

WHEREAS, the City Council now seeks to approve the use of the City's property for this desired purpose in order to achieve the ultimate right-of-way required to accommodate City's long-term transportation needs.

NOW, THEREFORE, BE IT RESOLVED, by the City Council of the City of Ontario, California:

1. The City Council of the City of Ontario hereby dedicates as an easement for public road and utility purposes, the property as depicted in the attached easement deed.

2. The City Clerk shall cause the attached easement deeds, attested by the City Clerk under seal, to be executed and recorded in the office of the recorder of the County of San Bernardino. An additional purpose for the easement deed is to ensure that future County assessor maps reflect this new expanded right-of-way dedicated for roadway and utility purposes.

3. The City Manager is authorized to execute the attached easement deed for the purposes stated herein.

The City Clerk of the City of Ontario shall certify as to the adoption of this Resolution.

PASSED, APPROVED AND ADOPTED this 19th day of April 2022.

_____
PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO LEGAL FORM:

_____
BEST, BEST & KREIGER, LLP
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. 2022- was duly passed and adopted by the City Council of the City of Ontario at their regular meeting held April 19, 2022 by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

The foregoing is the original of Resolution No. 2022- duly passed and adopted by the Ontario City Council at their regular meeting held April 19, 2022.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

Atlas Sheet:_____
File:_____
Prepared By:_____
Checked By:_____
No. of Parcels Involved: _____
Assessor's Parcel #:_____

Recording requested by City of Ontario,
and when recorded mail to:

City Clerk
City of Ontario
303 East "B" Street
Ontario, CA 91764

EXEMPT RECORDING FEES GOVERNMENT CODE SECTION 6103 & 27383 (SPACE ABOVE THIS LINE FOR RECORDER'S USE)

EASEMENT DEED OF RIGHT-OF-WAY DEDICATION

CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA

CITY OF ONTARIO, A MUNICIPAL CORPORATION

_____

_____
GRANTOR(S)

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged, Grantor(s) hereby grant(s) to the City of Ontario, a political subdivision of the State of California, for public street and public utilities purposes, a right-of-way easement in, over, under, upon, and across all that real property situated in the City of Ontario, County of San Bernardino, State of California, described as follows:

SEE ATTACHED EXHIBITS A AND B

SIGNATURE(S) OF GRANTOR(S) ***(NOTE: ATTACH NOTARY ACKNOWLEDGMENT)***

FULL NAME OF CORPORATION: City of Ontario, a Municipal Corporation

Scott Ochoa, City Manager

_____ _____
Print Name and Title Signature and Date

_____ _____
Print Name and Title Signature and Date

_____ _____
Print Name and Title Signature and Date

This is to certify that the interest in real property conveyed by the within instrument to the City of Ontario, California ("Grantee"), a municipal corporation, is hereby accepted by the undersigned officer pursuant to authority conferred by Resolution 2007-148 of the City Council adopted on December 18th, 2007, and the Grantee consents to the recordation thereof by its duly authorized officer.

CITY OF ONTARIO: _____
Khoi Do P.E. / City Engineer / Date

ATTEST: _____
City Clerk

EXHIBIT "A"

LEGAL DESCRIPTION

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, BEING PORTIONS OF BLOCKS 197 AND 198 OF THE MAP OF VILLA PLOTS SOUTH-SIDE TRACT, RECORDED IN BOOK 6, PAGE 11, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER OF PARCEL 14 AS DESCRIBED IN RESOLUTION NO. 6332, RECORDED APRIL 7, 1967 IN BOOK 6800, PAGE 587 OF OFFICIAL RECORDS, IN THE OFFICE OF SAID COUNTY RECORDER, THENCE ALONG THE NORTHERLY LINES OF SAID BLOCKS 197 AND 198, WEST 646.00 FEET TO THE NORTHWEST CORNER OF THE LAND DESCRIBED IN THE GRANT DEED RECORDED JUNE 15, 1971 IN BOOK 7688, PAGE 170 OF OFFICIAL RECORDS, IN THE OFFICE OF SAID COUNTY RECORDER;

THENCE ALONG THE WESTERLY LINE OF SAID GRANT DEED, SOUTH 33.00 FEET TO A LINE PARALLEL WITH AND 33.00 FEET SOUTHERLY OF, SAID NORTHERLY LINES;

THENCE ALONG SAID PARALLEL LINE, EAST 633.00 FEET TO A LINE PARALLEL WITH AND 13.00 FEET WESTERLY OF THE WEST LINE OF SAID PARCEL 14;

THENCE SOUTH 47°17'26" EAST 17.69 FEET TO A POINT ON THE WESTERLY LINE OF SAID PARCEL 14, SAID POINT BEING 45.00 FEET SOUTHERLY OF THE POINT OF BEGINNING;

THENCE ALONG SAID WESTERLY LINE NORTH 45.00 FEET TO THE POINT OF BEGINNING.

THE ABOVE DESCRIBED PARCEL OF LAND CONTAINS 21,396 SQUARE FEET (0.4612 ACRES), MORE OR LESS.

ALL AS SHOWN ON EXHIBIT "B" ATTACHED HERETO AND MADE A PART THEREOF.

THIS REAL PROPERTY DESCRIPTION HAS BEEN PREPARED BY ME, OR UNDER MY DIRECTION, IN CONFORMANCE WITH THE PROFESSIONAL LAND SURVEYOR'S ACT.

Patrick Earl

PATRICK D. EARL, P.L.S. 8773 (CA)
THIS DOCUMENT IS PRELIMINARY UNLESS SIGNED

03/29/2022
DATE

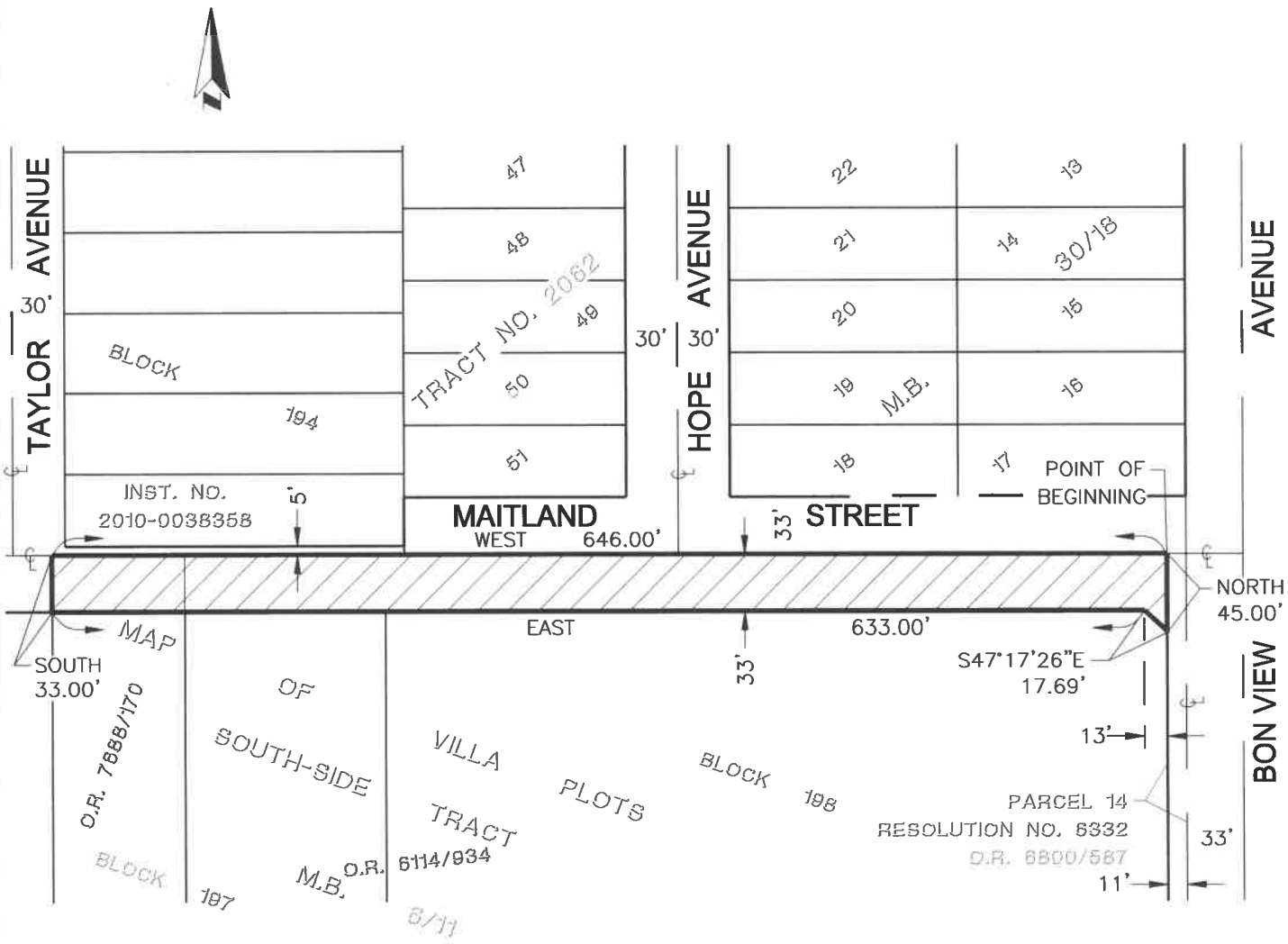
LICENSED LAND SURVEYOR
PATRICK DENNIS EARL
NO. 8773
STATE OF CALIFORNIA

0' 50' 100'
SCALE: 1"=100'

EXHIBIT "B"

PLAT TO ACCOMPANY LEGAL DESCRIPTION

SHEET 1 OF 1



LEGEND

BOUNDARY OF DESCRIPTION

AREA OF DESCRIPTION - 21,396 S.F.±

℄ CENTERLINE

LICENSED LAND SURVEYOR
PATRICK DENNIS EARL
NO. 8773
STATE OF CALIFORNIA

PATRICK D. EARL, P.L.S. 8773 (CA)
THIS DOCUMENT IS PRELIMINARY UNLESS SIGNED

03/29/2022
DATE

KDM MERIDIAN, INC. - 1340 REYNOLDS AVE., STE. 110 - IRVINE, CA. 92614 - PH. (949)768-0731

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, DEDICATING A RIGHT-OF-WAY EASEMENT FOR PUBLIC ROAD AND UTILITY PURPOSES OVER A PORTION OF A CITY-OWNED PARCEL (KIMBALL COMMUNITY PARK) AT WALNUT STREET AND CAMPUS AVENUE – APN: 1051-381-06.

WHEREAS, in accordance with the City's Master Plan of Streets and Highways, the existing City owned street at the southeast corner of parcel (APN: 1051-381-06) along Walnut Street and Campus Avenue requires additional public street right-of-way width; and

WHEREAS, the City has all rights, title and interest to the parcels situated on the southeast corner of Walnut Street and Campus Avenue as depicted on Exhibits "A" and "B" of the easement deed, from which necessary street right-of-way can be provided; and

WHEREAS, under state law, in order to improve a public road, the law generally requires a right-of-way dedication of property by its owner and acceptance by the City; and

WHEREAS, the City now seeks to dedicate a portion of said City-owned corner parcel as a right-of-way and utility easement; and

WHEREAS, the City Council now seeks to approve the use of the City's property for this desired purpose in order to achieve the ultimate right-of-way required to accommodate City's long-term transportation needs.

NOW, THEREFORE, BE IT RESOLVED, by the City Council of the City of Ontario, California:

1. The City Council of the City of Ontario hereby dedicates as an easement for public road and utility purposes, the property as depicted in the attached easement deed.

2. The City Clerk shall cause the attached easement deeds, attested by the City Clerk under seal, to be executed and recorded in the office of the recorder of the County of San Bernardino. An additional purpose for the easement deed is to ensure that future County assessor maps reflect this new expanded right-of-way dedicated for roadway and utility purposes.

3. The City Manager is authorized to execute the attached easement deed for the purposes stated herein.

The City Clerk of the City of Ontario shall certify as to the adoption of this Resolution.

PASSED, APPROVED AND ADOPTED this 19th day of April 2022.

_____
PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO LEGAL FORM:

_____
BEST, BEST & KREIGER, LLP
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. 2022- was duly passed and adopted by the City Council of the City of Ontario at their regular meeting held April 19, 2022 by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

The foregoing is the original of Resolution No. 2022- duly passed and adopted by the Ontario City Council at their regular meeting held April 19, 2022.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

Atlas Sheet:_____
File:_____
Prepared By:_____
Checked By:_____
No. of Parcels Involved: _____
Assessor's Parcel #: 1051-381-06

Recording requested by City of Ontario,
and when recorded mail to:

City Clerk
City of Ontario
303 East "B" Street
Ontario, CA 91764

EXEMPT RECORDING FEES GOVERNMENT CODE SECTION 6103 & 27383 (SPACE ABOVE THIS LINE FOR RECORDER'S USE)

EASEMENT DEED OF RIGHT-OF-WAY DEDICATION

CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA

CITY OF ONTARIO, A MUNICIPAL CORPORATION

GRANTOR(S)

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged, Grantor(s) hereby grant(s) to the City of Ontario, a political subdivision of the State of California, for public street and public utilities purposes, a right-of-way easement in, over, under, upon, and across all that real property situated in the City of Ontario, County of San Bernardino, State of California, described as follows:

SEE ATTACHED EXHIBITS A AND B

SIGNATURE(S) OF GRANTOR(S) ***(NOTE: ATTACH NOTARY ACKNOWLEDGMENT)***

FULL NAME OF CORPORATION: City of Ontario, a Municipal Corporation

Scott Ochoa, City Manager

Print Name and Title	Signature and Date
Print Name and Title	Signature and Date
Print Name and Title	Signature and Date

This is to certify that the interest in real property conveyed by the within instrument to the City of Ontario, California ("Grantee"), a municipal corporation, is hereby accepted by the undersigned officer pursuant to authority conferred by Resolution 2007-148 of the City Council adopted on December 18th, 2007, and the Grantee consents to the recordation thereof by its duly authorized officer.

CITY OF ONTARIO: _____
Khoi Do P.E. / City Engineer / Date

ATTEST: _____
City Clerk

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA)
) ss.
COUNTY OF SAN BERNARDINO)

On _____, before me, _____,
Date — Name And Title Of Officer (e.g. "Jane Doe, Notary Public")

Notary Public, personally appeared _____,
Name of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under penalty of perjury under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Place Notary Seal Above

_____
Signature of Notary Public

OPTIONAL

Though the data below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent reattachment of this form.

CAPACITY CLAIMED BY SIGNER

- ☐ Individual
- ☐ Corporate Officer

_____
Title(s)

- ☐ Partner(s) ☐ Limited ☐ General
- ☐ Attorney-In-Fact
- ☐ Trustee(s)
- ☐ Guardian/Conservator
- ☐ Other: _____

Signer is representing:
Name Of Person(s) Or Entity(ies)

_____

_____

DESCRIPTION OF ATTACHED DOCUMENT

Easement Deed of Right-of-Way Dedication
Title or Type of Document

_____
Number Of Pages

_____
Date Of Document

_____
Signer(s) Other Than Named Above

Last Updated 03/2015 File No._____ APN: 1051-381-06 Atlas Pg. _____

EXHIBIT "A"

APN: 1051-381-06

LEGAL DESCRIPTION

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, LYING WITHIN THAT PORTION OF LAND DESCRIBED IN GRANT DEED RECORDED ON JUNE 28, 1991 AS DOCUMENT NO. 91-244453 OF OFFICIAL RECORDS, DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF WALNUT AVENUE AND CAMPUS AVENUE; THENCE EASTERLY ALONG THE CENTERLINE OF SAID WALNUT AVENUE, SOUTH 89°56'58"E 660.40 FEET, TO ITS INTERSECTION WITH THE NORTHERLY EXTENSION OF THE EAST LINE OF SAID PARCEL; THENCE SOUTHERLY ALONG SAID NORTHERLY EXTENSION AND SAID EAST LINE, SOUTH 00°00'00" WEST 659.68 FEET, TO A LINE PARALLEL WITH AND 44 FEET SOUTHERLY FROM THE CENTERLINE OF WALNUT AVENUE; THENCE WESTERLY ALONG SAID PARALLEL LINE, NORTH 89°56'58" WEST 590.40 FEET, TO A POINT DISTANT 70.00 FEET EASTERLY FROM THE CENTERLINE OF CAMPUS AVENUE; THENCE SOUTHWESTERLY, SOUTH 45°00'49" WEST 28.27 FEET, TO A POINT DISTANT 64.00 FEET SOUTHERLY FROM THE CENTERLINE OF WALNUT STREET AND ON A LINE PARALLEL WITH AND 50.00 FEET EASTERLY FROM THE CENTERLINE OF CAMPUS AVENUE; THENCE SOUTHERLY ALONG LAST-MENTIONED PARALLEL LINE SOUTH 00°00'26" EAST TO THE SOUTH LINE OF SAID PARCEL; THENCE WESTERLY ALONG SAID SOUTH LINE AND ITS WESTERLY EXTENSION, NORTH 89°57'17" WEST 50.00 FEET TO THE CENTERLINE OF CAMPUS AVENUE; THENCE NORTHERLY ALONG SAID CENTERLINE, NORTH 00°00'26" WEST TO THE POINT OF BEGINNING.

CONTAINING: 53,607 SQUARE FEET OR 1.231 ACRES MORE OR LESS.

ALL AS SHOWN ON EXHIBIT "B", ATTACHED HERETO AND MADE A PART THEREOF.

THIS REAL PROPERTY DESCRIPTION HAS BEEN PREPARED BY ME, OR UNDER MY DIRECTION, IN CONFORMANCE WITH THE PROFESSIONAL LAND SURVEYOR'S ACT.

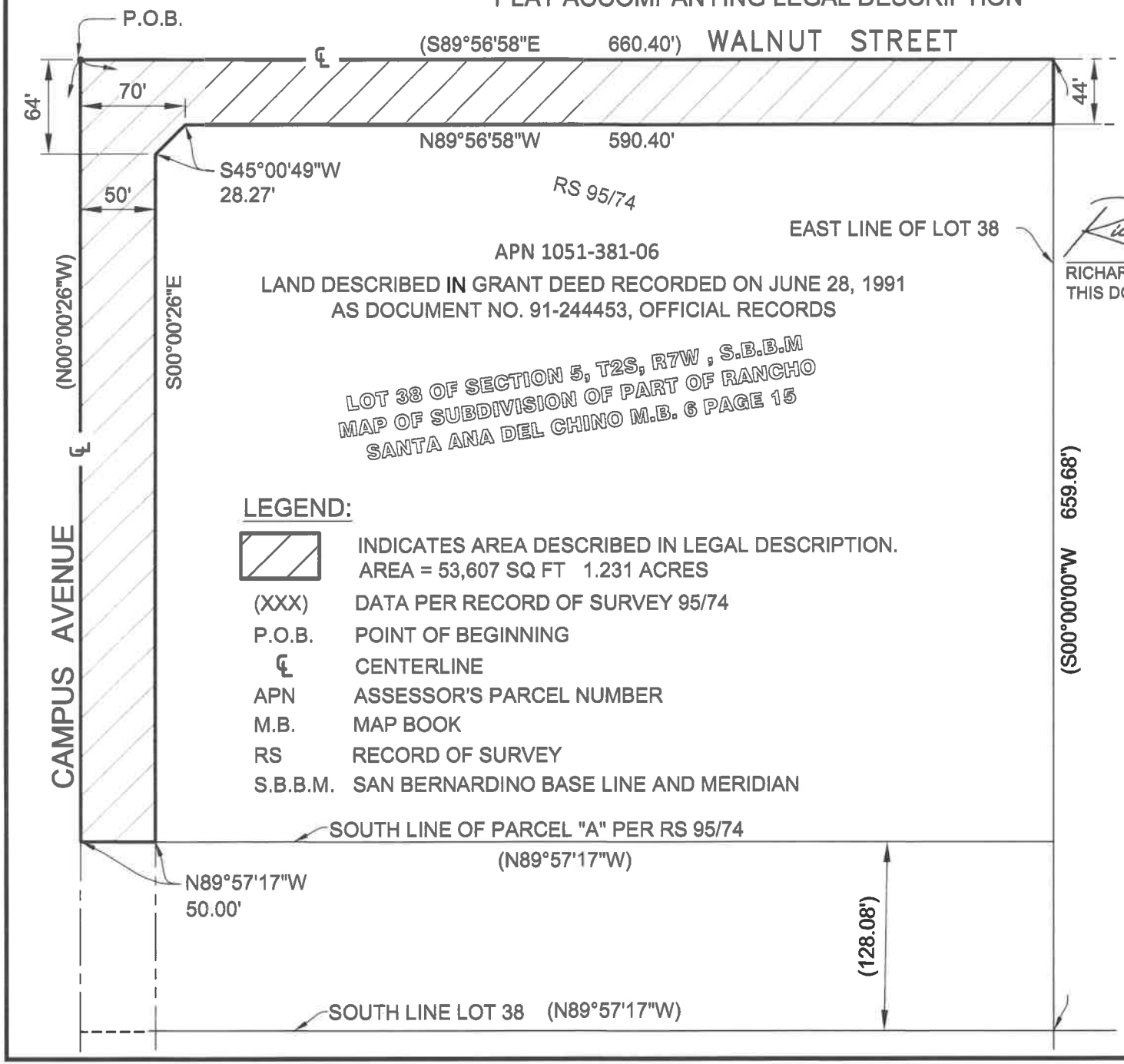
Richard C Maher 3/22/22

RICHARD C. MAHER, P.L.S. 7564 (CA) DATE

THIS DOCUMENT IS PRELIMINARY UNLESS SIGNED

EXHIBIT "B"

PLAT ACCOMPANYING LEGAL DESCRIPTION



Richard C Maher 3/22/22

RICHARD C. MAHER, P.L.S. 7564 (CA) DATE

THIS DOCUMENT IS PRELIMINARY UNLESS SIGNED

LICENSED LAND SURVEYOR
RICHARD C. MAHER
NO. 7564
STATE OF CALIFORNIA

LEGEND:

	INDICATES AREA DESCRIBED IN LEGAL DESCRIPTION. AREA = 53,607 SQ FT 1.231 ACRES
(XXX)	DATA PER RECORD OF SURVEY 95/74
P.O.B.	POINT OF BEGINNING
℄	CENTERLINE
APN	ASSESSOR'S PARCEL NUMBER
M.B.	MAP BOOK
RS	RECORD OF SURVEY
S.B.B.M.	SAN BERNARDINO BASE LINE AND MERIDIAN

SCALE: 1" = 100'

SHEET:	1 OF 1
DRAFTED:	CC
CHECKED:	KL
DATE:	3-22-2022

CITY OF ONTARIO

CITY OF ONTARIO *Agenda Report* **April 19, 2022**	**SECTION:** **CONSENT CALENDAR**
Department: Police Department Prepared By: Mary Salem Staff Member Presenting: Mike Lorenz, Chief of Police Reviewed By: Lizceth Zazueta Approved By:	Submitted To: Council/OHA Approved: _____ Continued To: _____ Denied: _____ Item No: 4

SUBJECT: **ACCEPTANCE OF GRANT AWARD FROM THE U.S. DEPARTMENT OF HOMELAND SECURITY AND THE CALIFORNIA OFFICE OF EMERGENCY SERVICES PROVIDED THROUGH THE FY 2020 URBAN AREA SECURITY INITIATIVE (UASI) GRANT PROGRAM**

RECOMMENDATION: That the City Council authorize the City Manager to execute all documents necessary to accept a three-year sub-grant award in the amount of $603,025 from the U.S. Department of Homeland Security and the California Office of Emergency Services provided through the FY 2020 UASI Grant Program.

THE FOLLOWING COUNCIL GOALS ARE BEING ACHIEVED:
Maintain the Current High Level of Public Safety
Pursue City's Goals and Objectives by Working with Other Governmental Agencies

FISCAL IMPACT: The City, through the Riverside Urban Area Security Initiative (RUASI) grant has been awarded $603,025 to implement a Facial Recognition Project and associated camera networks at the Ontario International Airport. The associated grant revenue and expenditure adjustments will be presented in the next Quarterly Budget Report to the City Council. The City is not required to provide matching funds for this reimbursable grant.

BACKGROUND & ANALYSIS: The UASI program provides financial assistance to address multi-discipline planning, operations, equipment, training, and exercise needs unique to high-threat, high density urban areas, and to assist them in building and sustaining capabilities to prevent, protect against, respond to, and recover from threats or acts of terrorism and weapons of mass destruction. The intent of the UASI program is to enhance regional preparedness and expand collaboration efforts.

The RUASI includes the cities of Riverside, San Bernardino and Ontario, and the counties of Riverside and San Bernardino. Projects are recommended for consideration by the RUASI Steering Group and local Approval Authority, which are comprised of Staff from the three cities and two counties. Recommendations are made based upon the ability to match project benefits from the UASI program guidelines, which include a focus on regional coordination and collaboration. The

Riverside Regional UASI's recommended projects are then subject to review and approval at the State and Federal levels.

The City of Ontario, as a sub-recipient of the FY 2020 RUASI Grant, has been approved to receive $603,025 for the acquisition of a Facial Recognition Project and based upon the following recommended spending plan:

Facial Recognition software and cameras	$ 603,025
TOTAL	**$ 603,025**

The City is not obligated to continue with these grant programs beyond the equipment's operational life. Upon termination of the programs, Staff will work with the City of Riverside Office of Emergency Services (the designated Riverside Regional UASI Administrative Entity) and the Department of Homeland Security to properly demobilize and surplus the equipment.

CITY OF ONTARIO *Agenda Report* **April 19, 2022**	**SECTION:** **CONSENT CALENDAR**
Department: Community Improvement Prepared By: Douglas J Sorel Staff Member Presenting: Scott Murphy, Executive Director Community Development Approved By:	Submitted To: Council/OHA Approved: _____ Continued To: _____ Denied: _____ Item No: 5

SUBJECT: A RESOLUTION FOR PLACEMENT OF SPECIAL ASSESSMENTS ON THE SAN BERNARDINO COUNTY TAX ROLLS

RECOMMENDATION: That the City Council adopt a Resolution for recovery of fees and costs incurred in abating property and dangerous building violations, as well as administrative citations and civil penalties associated with property maintenance violations, and placing assessments on the San Bernardino County Tax Rolls.

THE FOLLOWING COUNCIL GOALS ARE BEING ACHIEVED:
Operate in a Businesslike Manner
Focus Resources in Ontario's Commercial and Residential Neighborhoods

FISCAL IMPACT: The levy of special assessments will result in the recovery of $45,108.01 in costs that the City has expended for inspection or abatement of property violations, as well as the collection of $7,590.00 associated with civil penalties and/or fines for continued violations, for a total of $52,698.01 related to 52 parcels. When received, these reimbursements will be deposited into the General Fund. The special assessment revenue will be included in the proposed Fiscal Year 2022-23 Budget.

BACKGROUND & ANALYSIS: The City has established revolving funds to cover the City costs for abatement of property and dangerous building violations as a result of Community Improvement activities. Additionally, the City has established administrative citations and fines for property maintenance violations and fees and penalties associated with the Systematic Health and Safety Inspection Program, Abandoned and Distressed Property Program, and Weed and Refuse Abatement Program. These costs, fines, fees, and penalties are recovered through placement of special tax assessments upon the properties. The placement of special assessments and collection of revenue is done under Ordinance 3046, Property Appearance (Title 5, Chapter 22 of the Ontario Municipal Code); Chapter 9 of the Uniform Code for the Abatement of Dangerous Buildings; and, Ordinance 2920 for civil penalties for continued violations of the Ontario Municipal Code and fines associated with administrative citations (Title 1, Chapters 2 and 5 of the Ontario Municipal Code). The City and County currently have a contractual agreement regarding implementation of special assessments; however, a Resolution authorizing the placement of the specific assessments is

required. During this assessment cycle, the Community Improvement Department has billed property owners for: the abatement of violations; the issuance of fines associated with administrative citation; the issuance of fees and penalties associated with the Systematic Health and Safety Inspection Program; the issuance of registration fees and civil penalties associated with the Abandoned and Distressed Property Program; the issuance of notice and re-inspection fees; and, civil penalties for the Weed and Refuse Abatement Program on 268 parcels. Of these, there are remaining amounts due on 52 parcels. Attached are itemized accounts of: (1) costs associated with inspection or abatement as shown in Exhibit A of the Resolution; (2) civil penalties and/or fines for continued violations as shown in Exhibit B of the Resolution; and (3) total amounts per parcel as shown in Exhibit C of the Resolution. The expenditure list, with any necessary corrections and adjustments, will be submitted to the County prior to August 2022 for its 2022-2023 tax rolls. All affected property owners were given notice of the imposition of special assessments via certified mail as provided in Ontario Municipal Code Section 1-4.05(a) and have either not requested an appeal or have exhausted the appellate procedure in Ontario Municipal Code Section 1-4.05(b).

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, ADOPTING A REPORT REQUESTING THE PLACEMENT OF SPECIAL ASSESSMENTS ON PROPERTY TAX BILLS FOR CIVIL PENALTIES OR RECOVERY OF COSTS INCURRED FOR ABATEMENT OF VIOLATIONS OF CITY CODES AND ORDINANCES.

WHEREAS, Ordinance No. 3046, Property Appearance (Title 5, Chapter 22, of the Ontario Municipal Code) and Chapter 9 of the Uniform Code for the Abatement of Dangerous Buildings provide for the abatement of property nuisances by repair, rehabilitation, demolition or removal; and

WHEREAS, under Resolution 94-112, Resolution ORA-499, and the Cooperation and Reimbursement Agreement entered into on the 15th day of November, 1994, by the City of Ontario and the Ontario Redevelopment Agency, the Ontario Redevelopment Agency made a one-time advance to the City of One Hundred Fifty Thousand Dollars ($150,000) to repair or abate dangerous buildings and properties throughout the City; and

WHEREAS, under a first amendment to the Cooperation and Reimbursement Agreement entered into on the 16th day of July 1996, by the City of Ontario and the Ontario Redevelopment Agency, the Ontario Redevelopment Agency made an additional advance to the City of One Hundred Thousand Dollars ($100,000) to continue to repair or abate dangerous buildings and properties throughout the City; and

WHEREAS, under Resolution 94-113, Resolution ORA-500, and the Cooperation and Reimbursement Agreement entered into on the 15th day of November 1994, by the City of Ontario and the Ontario Redevelopment Agency, the Ontario Redevelopment Agency made a one-time advance to the City of Thirty Thousand Dollars ($30,000) to repair or abate dangerous buildings and properties in the 6th and Grove area; and

WHEREAS, under Resolution 94-12, Resolution ORA-464, and the Cooperation and Reimbursement Agreement entered into on the 22nd day of February 1994, by the City of Ontario and the Ontario Redevelopment Agency, the Ontario Redevelopment Agency made a one-time advance to the City of One Hundred Fifty Thousand Dollars ($150,000) to repair or demolish dangerous buildings throughout the City; and

WHEREAS, Ordinance No. 2894, Systematic Health and Safety Inspection Program (Title 8, Chapter 17, of the Ontario Municipal Code), provides for the collection of unpaid service fees, plus any penalties and accrued interest by Special Assessment; and

WHEREAS, Ordinance No. 2920, provides for the assessment of civil penalties for continued violations of the Ontario Municipal Code (Title 1, Chapter 2 of the Ontario Municipal Code), and for fines associated with administrative citations to be collected by Special Assessment (Title 1, Chapter 5 of the Ontario Municipal Code), and establishes a uniform procedure before imposing such Special Assessments (Title 1, Chapter 4 of the Ontario Municipal Code); and

WHEREAS, the above said ordinances, resolutions and agreements provide for recovery of costs incurred in the abatement of violations by means of a Special Assessment placed on the tax rolls; and

WHEREAS, the City has incurred costs involved in the abatement of violations under the Ontario Municipal Code and Uniform Code for the Abatement of Dangerous Buildings, issuing Notices of Violation, and administering the Systematic Health and Safety Program and wishes to recover said costs; and

WHEREAS, the owners of all parcels listed in Exhibit A, B, and C were given notice of imposition of such Special Assessment as provided in Ontario Municipal Code Section 1-4.05(a), and either have not requested an appeal, or have exhausted the appellate procedure provided in Ontario Municipal Code Section 1-4.05(b); and

WHEREAS, the City has an executed contract with the San Bernardino County Board of Supervisors for collection of said assessments;

NOW, THEREFORE, BE IT RESOLVED that the City Council:

1. Confirmed the costs associated with inspection or abatement on the properties as set forth in the report in Exhibit A; and

2. Confirmed the civil penalties and/or fines for continued violations on the properties as set forth in the report in Exhibit B; and

3. Confirmed that Exhibit C contains the total amount assessed for both confirmed costs and confirmed civil penalties and/or fines for each of the properties; and

4. Found and determined that the report, and Exhibits contained therein are true and accurate; and

5. Adopts the above said report and finds that the costs of inspection or abatement on the properties listed are the costs set forth in Exhibit A, the civil penalties and/or fines for continued violations are the penalties and/or fines as set forth in Exhibit B, and the same are hereby charged and placed as special assessments upon the respective properties; and

6. Directs Exhibit C shall be sent to the Auditor-Controller of San Bernardino County and shall be collected on the County tax roll.

The City Clerk of the City of Ontario shall certify as to the adoption of this Resolution.

PASSED, APPROVED, AND ADOPTED this 19th day of April 2022.

_____
PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO LEGAL FORM:

_____
BEST BEST & KRIEGER LLP
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. 2022- was duly passed and adopted by the City Council of the City of Ontario at their regular meeting held April 19, 2022, by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

The foregoing is the original of Resolution No. 2022- duly passed and adopted by the Ontario City Council at their regular meeting held April 19, 2022.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

City of Ontario
Community Improvement Department
2022/2023 Tax Roll Year Special Assessments
Exhibit A - Costs Associated with Inspection or Abatement

Parcel Number	Address	Amount Due
0108-412-18	1722 N DEL NORTE AV, Ontario, CA 91764	187.00
0110-061-04	1323 E HOLT BL, Ontario, CA 91761	91.00
0110-153-14	816 N AMADOR AV, Ontario, CA 91764	19,744.23
0110-241-33	1820 E G ST, Ontario, CA 91764	288.00
0110-365-02	935 N SACRAMENTO AV, Ontario, CA 91764	167.00
0110-431-09	790 N ARCHIBALD AV, Building:5, Unit:A, Ontario, CA 91764	1,137.97
0113-351-49	1215 E ACACIA ST, Unit:101, Ontario, CA 91761	984.22
0211-222-37	801 S DUPONT AV, Building:1, Unit:J, Ontario, CA 91761	930.70
0211-232-29	4200 E SANTA ANA ST, Unit:B, Ontario, CA 91761	566.42
0216-311-03	0 S GROVE AV, Ontario, CA 91761	148.00
0216-491-50	1419 E RIVERSIDE DR, Ontario, CA 91761	3,556.17
0218-241-36	0 E EDISON AV, Ontario, CA 91710	91.00
0218-372-48	3643 S GROWER AV, Ontario, CA 91761	500.00
0218-473-29	3130 E MAYACAMA WY, Ontario, CA 91761	447.00
0218-614-18	3131 E YOSEMITE DR, Ontario, CA 91762	1,295.04
1014-221-38	1221 W LOCUST ST, Ontario, CA 91762	148.00
1047-252-15	340 W CAROLINE CT, Ontario, CA 91762	147.00
1047-311-53	525 W SIXTH ST, Ontario, CA 91762	144.21
1047-473-15	1054 E PRINCETON ST, Ontario, CA 91764	559.77
1047-594-42	1213 N SAN ANTONIO AV, Ontario, CA 91762	1,386.04
1048-022-34	1010 N SAN ANTONIO AV, Ontario, CA 91762	3,410.62
1048-213-18	739 E H ST, Ontario, CA 91764	1,527.00
1048-431-45	439 N CUCAMONGA AV, Ontario, CA 91764	91.00
1048-565-09	207 N EUCLID AV, Ontario, CA 91762	2,256.10
1048-566-07	303 N EUCLID AV, Building:1, Ontario, CA 91762	867.00
1049-246-08	514 S CHERRY AV, Ontario, CA 91761	147.00
1049-333-04	209 W CARLTON ST, Unit:A, Ontario, CA 91762	267.00
1050-181-03	1175 E FRANCIS ST, Building:1, Ontario, CA 91761	562.65
1050-251-01	1727 S EUCLID AV, Ontario, CA 91761	285.87
1050-551-06	645 E SPRUCE ST, Ontario, CA 91761	827.00
1051-171-41	2424 S GROVE AV, Ontario, CA 91761	347.00
1083-071-19	0 S ARCHIBALD AV, Ontario, CA 91761	148.00
1083-071-20	0 S ARCHIBALD AV, Ontario, CA 91761	148.00
1083-111-15	2443 S NORTH SHORES PL, Ontario, CA 91761	91.00
1083-171-07	3242 E CLEAR LAKE RD, Ontario, CA 91761	427.00
1083-271-19	2770 S RIPPLING BROOK PL, Ontario, CA 91761	1,187.00
		45,108.01

City of Ontario
Community Improvement Department
2022/2023 Tax Roll Year Special Assessments
Exhibit B - Civil Penalties and/or Fines for Continued Violations

Parcel Number	Address	Amount Due
0110-241-33	1820 E G ST, Ontario, CA 91764	500.00
0216-311-03	0 S GROVE AV, Ontario, CA 91761	500.00
0218-372-48	3643 S GROWER AV, Ontario, CA 91761	20.00
1010-154-07	935 W BERKELEY CT, Ontario, CA 91762	320.00
1010-191-30	1025 W I ST, Ontario, CA 91762	220.00
1010-232-13	852 N JASMINE AV, Ontario, CA 91762	120.00
1014-121-06	0 S OAKS AV, Ontario, CA 91762	120.00
1014-211-13	1320 W FRANCIS ST, Ontario, CA 91762	490.00
1014-221-38	1221 W LOCUST ST, Ontario, CA 91762	500.00
1047-252-15	340 W CAROLINE CT, Ontario, CA 91762	520.00
1047-511-38	529 E HARVARD PL, Ontario, CA 91764	120.00
1048-071-41	223 E PLAZA SERENA ST, Ontario, CA 91764	170.00
1048-091-01	1050 N SULTANA AV, Ontario, CA 91764	170.00
1048-104-04	845 E ROSEWOOD CT, Ontario, CA 91764	840.00
1048-431-30	1046 E G ST, Ontario, CA 91764	120.00
1049-091-05	541 E EMPORIA ST, Ontario, CA 91761	640.00
1049-312-16	754 W CARLTON ST, Ontario, CA 91762	120.00
1050-251-01	1727 S EUCLID AV, Ontario, CA 91761	520.00
1050-251-27	317 E FRANCIS ST, Ontario, CA 91761	120.00
1050-401-29	229 E GREVILLEA ST, Ontario, CA 91761	120.00
1051-011-65	2229 S CYPRESS AV, Ontario, CA 91762	220.00
1083-051-20	2826 S HARBOUR TOWN TR, Ontario, CA 91761	120.00
1083-071-19	0 S ARCHIBALD AV, Ontario, CA 91761	500.00
1083-071-20	0 S ARCHIBALD AV, Ontario, CA 91761	500.00
		7,590.00

City of Ontario
Community Improvement Department
2022/2023 Tax Roll Year Special Assessments
Exhibit C - Total Amounts per Parcel

Parcel Number	Address	Amount Due
0108-412-18	1722 N DEL NORTE AV, Ontario, CA 91764	187.00
0110-061-04	1323 E HOLT BL, Ontario, CA 91761	91.00
0110-153-14	816 N AMADOR AV, Ontario, CA 91764	19,744.23
0110-241-33	1820 E G ST, Ontario, CA 91764	788.00
0110-365-02	935 N SACRAMENTO AV, Ontario, CA 91764	167.00
0110-431-09	790 N ARCHIBALD AV, Building:5, Unit:A, Ontario, CA 91764	1,137.97
0113-351-49	1215 E ACACIA ST, Unit:101, Ontario, CA 91761	984.22
0211-222-37	801 S DUPONT AV, Building:1, Unit:J, Ontario, CA 91761	930.70
0211-232-29	4200 E SANTA ANA ST, Unit:B, Ontario, CA 91761	566.42
0216-311-03	0 S GROVE AV, Ontario, CA 91761	648.00
0216-491-50	1419 E RIVERSIDE DR, Ontario, CA 91761	3,556.17
0218-241-36	0 E EDISON AV, Ontario, CA 91710	91.00
0218-372-48	3643 S GROWER AV, Ontario, CA 91761	520.00
0218-473-29	3130 E MAYACAMA WY, Ontario, CA 91761	447.00
0218-614-18	3131 E YOSEMITE DR, Ontario, CA 91762	1,295.04
1010-154-07	935 W BERKELEY CT, Ontario, CA 91762	320.00
1010-191-30	1025 W I ST, Ontario, CA 91762	220.00
1010-232-13	852 N JASMINE AV, Ontario, CA 91762	120.00
1014-121-06	0 S OAKS AV, Ontario, CA 91762	120.00
1014-211-13	1320 W FRANCIS ST, Ontario, CA 91762	490.00
1014-221-38	1221 W LOCUST ST, Ontario, CA 91762	648.00
1047-252-15	340 W CAROLINE CT, Ontario, CA 91762	667.00
1047-311-53	525 W SIXTH ST, Ontario, CA 91762	144.21
1047-473-15	1054 E PRINCETON ST, Ontario, CA 91764	559.77
1047-511-38	529 E HARVARD PL, Ontario, CA 91764	120.00
1047-594-42	1213 N SAN ANTONIO AV, Ontario, CA 91762	1,386.04
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1048-071-41	223 E PLAZA SERENA ST, Ontario, CA 91764	170.00
1048-091-01	1050 N SULTANA AV, Ontario, CA 91764	170.00
1048-104-04	845 E ROSEWOOD CT, Ontario, CA 91764	840.00
1048-213-18	739 E H ST, Ontario, CA 91764	1,527.00
1048-431-30	1046 E G ST, Ontario, CA 91764	120.00
1048-431-45	439 N CUCAMONGA AV, Ontario, CA 91764	91.00
1048-565-09	207 N EUCLID AV, Ontario, CA 91762	2,256.10
1048-566-07	303 N EUCLID AV, Building:1, Ontario, CA 91762	867.00
1049-091-05	541 E EMPORIA ST, Ontario, CA 91761	640.00
1049-246-08	514 S CHERRY AV, Ontario, CA 91761	147.00
1049-312-16	754 W CARLTON ST, Ontario, CA 91762	120.00
1049-333-04	209 W CARLTON ST, Unit:A, Ontario, CA 91762	267.00
1050-181-03	1175 E FRANCIS ST, Building:1, Ontario, CA 91761	562.65
1050-251-01	1727 S EUCLID AV, Ontario, CA 91761	805.87
1050-251-27	317 E FRANCIS ST, Ontario, CA 91761	120.00
1050-401-29	229 E GREVILLEA ST, Ontario, CA 91761	120.00
1050-551-06	645 E SPRUCE ST, Ontario, CA 91761	827.00

City of Ontario
Community Improvement Department
2022/2023 Tax Roll Year Special Assessments
Exhibit C - Total Amounts per Parcel

Parcel Number	Address	Amount Due
1051-011-65	2229 S CYPRESS AV, Ontario, CA 91762	220.00
1051-171-41	2424 S GROVE AV, Ontario, CA 91761	347.00
1083-051-20	2826 S HARBOUR TOWN TR, Ontario, CA 91761	120.00
1083-071-19	0 S ARCHIBALD AV, Ontario, CA 91761	648.00
1083-071-20	0 S ARCHIBALD AV, Ontario, CA 91761	648.00
1083-111-15	2443 S NORTH SHORES PL, Ontario, CA 91761	91.00
1083-171-07	3242 E CLEAR LAKE RD, Ontario, CA 91761	427.00
1083-271-19	2770 S RIPPLING BROOK PL, Ontario, CA 91761	1,187.00
52		**52,698.01**

CITY OF ONTARIO *Agenda Report* **April 19, 2022**	**SECTION:** **CONSENT CALENDAR**
Department: Housing Prepared By: Hannah K Mac Kenzie Staff Member Presenting: Scott Murphy, Executive Director Community Development Approved By:	Submitted To: Council/OHA Approved: _____ Continued To: _____ Denied: _____ Item No: 6

SUBJECT: **FIRST AMENDMENT TO THE CONSOLIDATED PLAN ANNUAL ACTION PLAN FOR THE 2021-22 PROGRAM YEAR AND AMENDMENT TO HOME PROGRAM PARTICIPATION AMENDMENT BETWEEEN THE CITY OF ONTARIO, ONTARIO HOUSING AUTHORITY AND MERCY HOUSE CHDO FOR THE ACQUISITION AND REHABILITATION OF 411 N. PARKSIDE AVENUE**

RECOMMENDATION: That City Council ("City") and the Board of the Ontario Housing Authority ("Authority") take the following actions:

1. Approve the First Amendment to the FY 2021-22 Annual Action Plan (on file in the Records Management Department) ("Substantial Amendment");
2. Approve the First Amendment to the HOME Program Participation Agreement among the City of Ontario, Ontario Housing Authority, and Mercy House CHDO, Inc. for the acquisition and rehabilitation of 411 North Parkside Avenue (on file in the Records Management Department); and
3. Authorize the City Manager/Executive Director or his designee to sign all documents necessary to implement the Agreements.

THE FOLLOWING COUNCIL GOALS ARE BEING ACHIEVED:
Pursue City's Goals and Objectives by Working with Other Governmental Agencies
Focus Resources in Ontario's Commercial and Residential Neighborhoods

FISCAL IMPACT: If approved, the Substantial Amendment will program $418,283 in currently unallocated Home Investment Partnerships Program (HOME) Entitlement and CHDO Reserve funds to the FY 2021-22 budget which will be included with the year-end budget update. Programmed funds will be used to complete the acquisition and rehabilitation of 411 N. Parkside Ave. No General Fund monies will be used for this project.

BACKGROUND & ANALYSIS: On June 21, 2017, the City Council and Board of the Ontario Housing Authority approved the HOME Partnership Agreement for the disposition and rehabilitation of the property located at 411 North Parkside Avenue. The property was sold to Mercy House CHDO, Inc. (MHC) pursuant to the agreement on February 14, 2018. The project experienced a number of

delays for the rehabilitation due to coordination with the TCC-funded solar program, scope of work changes, and the COVID-19 pandemic. Bids were solicited for the rehabilitation by MHC with a bid closing date of February 3, 2022. MHC received only one qualified bid in the amount of $688,865.97. This exceeds the available funds for the project by $418,282.87. The additional funding required for the project constitutes a substantial amendment according to the City's Citizen Participation Plan.

On May 4, 2021, the City Council approved the FY 2021-22 One-Year Action Plan. The First Amendment to the FY 2021-22 One-Year Action Plan will fund the additional $418,283 required to complete the project from unallocated HOME funding. The additional funding will be added to the existing loan between the City of Ontario and MHC for a total loan amount of $1,950,953 and requires an amendment to the HOME Program Participation Agreement among the City of Ontario, Ontario Housing Authority, and Mercy House CHDO, Inc.

Construction will begin upon loan closing and is scheduled to be completed within six months.

CITY OF ONTARIO *Agenda Report* **April 19, 2022**	**SECTION:** **CONSENT CALENDAR**
Department: Public Works Prepared By: Bonnie Tam Staff Member Presenting: Tito Haes, Executive Director Public Works Reviewed By: Bonnie Tam Approved By:	Submitted To: Council/OHA Approved: _____ Continued To: _____ Denied: _____ Item No: 7

SUBJECT: **A RESOLUTION ESTABLISHING PARKING RESTRICTIONS FOR STREET SWEEPING PURPOSES ON CERTAIN PORTIONS OF NORTH VIRGINIA STREET BETWEEN EAST 6TH STREET AND EAST DEODAR STREET IN THE CITY OF ONTARIO**

RECOMMENDATION: That the City Council adopt a Resolution of the City Council establishing parking restrictions for street sweeping purposes on certain portions of North Virginia Street between East 6th Street and East Deodar Street in the City of Ontario.

THE FOLLOWING COUNCIL GOALS ARE BEING ACHIEVED:
Operate in a Businesslike Manner

FISCAL IMPACT: There will be nominal administrative costs of $600 related to signage, which is included in the FY 2021-22 Gas Tax Adopted Budget.

BACKGROUND & ANALYSIS: On July 6, 2021, the City of Ontario adopted Ordinance No. 3188, adding Section 4- 6.1019 to Article 10 of Chapter 6 of Title 4 to establish parking restrictions on public streets for street sweeping purposes. This Ordinance was adopted pursuant to the authority provided to the City by California Vehicle Code Section 22507.6, which permits local authorities to prohibit or restrict the parking or standing of vehicles on designated streets or highways, or portions thereof, for the purpose of street sweeping.

In accordance with Section 4-6.1019, the Executive Director of Public Works established a process for the creation of street sweeping parking restrictions on designated streets. A resident will initiate a request by submitting a petition to Public Works Agency Staff. If two-thirds or greater of the residents in the area agree with a proposed parking restriction, Staff would recommend adoption of a Resolution to designate parking restrictions.

Pursuant to this process, a petition was submitted to the Public Works Agency by a resident from North Virginia Street between East 6th Street and East Deodar Street. Staff verified that two-thirds of residents or greater desired parking restrictions for street sweeping.

Accordingly, Staff recommends that the City Council approve the following parking restriction for

this area:

1. North Virginia Street between East 6th Street and East Deodar Street (no parking on both sides of the street on Wednesdays from 10 A.M. to 2 P.M.)

The proposed Resolution would approve the aforementioned parking restrictions, in accordance with Section 4-6.1019(c).

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, ESTABLISHING PARKING RESTRICTIONS FOR STREET SWEEPING PURPOSES ON CERTAIN PORTIONS OF NORTH VIRGINIA STREET BETWEEN EAST 6TH STREET AND EAST DEODAR STREET IN THE CITY OF ONTARIO.

WHEREAS, the California Vehicle Code Section 22507.6 permits local authorities to prohibit or restrict the parking or standing of vehicles on designated streets or highways, or portions thereof, for the purpose of street sweeping; and

WHEREAS, on July 6, 2021, the City of Ontario adopted Ordinance No. 3188, adding Section 4-6.1019 to Article 10 of Chapter 6 of Title 4 to establish parking restrictions on public streets for street sweeping; and

WHEREAS, in accordance with Section 4-6.1019(b), the Executive Director of Public Works established a process for designating restricted parking zones for street sweeping purposes, as follows: residents would initiate requests by submitting a petition with signatures from residents who encompass two-thirds or greater of the residents of the block; and

WHEREAS, Section 4-6.1019(c) authorizes the City Council to establish designated restricted parking zones for street sweeping purposes, by resolution; and

WHEREAS, staff has received the requisite petition with two-thirds of residents or greater in support of parking restrictions from a resident of the City and is recommending to the City Council adoption of a resolution to designate parking restrictions in those areas; and

WHEREAS, the City Council wishes to adopt a resolution, pursuant to Section 4-6.1019(c) on the Ontario Municipal Code, designating portions of North Virginia Street between East 6th street and East Deodar Street, on certain dates and times, as restricted parking zones for street sweeping purposes.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF ONTARIO DOES HEREBY RESOLVE AND DECLARE AS FOLLOWS:

SECTION 1. Recitals. The Recitals set forth above are true and correct and are incorporated into this Resolution by this reference.

SECTION 2. Regulation. The City Council hereby designates the following as restricted parking zones, on the days and times indicated, for street sweeping purposes:

A. North Virginia Street between East 6th street and East Deodar Street: No parking on both sides of the street on Wednesdays from 10 A.M. to 2 P.M.

SECTION 3. Exceptions. Pursuant to Vehicle Code section 22507.6, in residential areas, the parking restrictions established by this resolution shall not apply to commercial vehicles making pickups or deliveries of goods, wares, or merchandise from or to any building or structure located on a restricted street, or for the purpose of delivering materials to be used in the repair, alteration, remodeling or reconstruction of any building or structure for which a building permit has previously been obtained.

SECTION 4. Signage. The City Manager shall cause appropriate signage to be posted on each street on which parking is restricted for the purpose of street sweeping. The signage shall be in accordance with the requirements of Vehicle Code section 22507.6 and shall set forth the days and hours during which parking is prohibited for the purpose of street sweeping. The parking restrictions established in this Resolution shall become effective upon posting of the signage.

SECTION 5. CEQA. The Council finds that this project is categorically exempt from the California Environmental Quality Act under Title 14 of the California Code of Regulations sections 15301 (existing facilities) and 15304 (minor alterations to existing public facilities) and no further environmental assessment is necessary.

SECTION 6. Severability. If any provision of this Resolution or the application of any such provision to any person or circumstance is held invalid, such invalidity shall not affect other provisions or applications of this Resolution that can be given effect without the invalid provision or application, and to this end the provisions of this Resolution are severable. The City declares that the City Council could have adopted this Resolution irrespective of the invalidity of any particular portion of this Resolution.

SECTION 7. Effective Date. This Resolution shall become effective immediately upon its adoption.

The City Clerk of the City of Ontario shall certify as to the adoption of this Resolution.

PASSED, APPROVED, AND ADOPTED this 19th day of April 2022.

_____

PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO LEGAL FORM:

_____
BEST BEST & KRIEGER LLP
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. 2022- was duly passed and adopted by the City Council of the City of Ontario at their regular meeting held April 19, 2022, by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

The foregoing is the original of Resolution No. 2022- duly passed and adopted by the Ontario City Council at their regular meeting held April 19, 2022.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

CITY OF ONTARIO *Agenda Report* **April 19, 2022**	**SECTION:** **CONSENT CALENDAR**
Department: Municipal Services Prepared By: Michael Johnson Staff Member Presenting: Tito Haes, Executive Director Public Works Reviewed By: Bonnie Tam Approved By:	Submitted To: Council/OHA Approved: _____ Continued To: _____ Denied: _____ Item No: 8

SUBJECT: A CONSTRUCTION CONTRACT FOR A POLICE DEPARTMENT FLEET SERVICES SHOP

RECOMMENDATION: That the City Council take the following actions:

A. Reject Clawson Automotive Equipment and SAS Construction's bid as being non-responsive;
B. Award a Construction Contract (on file with Records Management Department) to BCM Group, Inc. of Rancho Cucamonga, California for the construction of a Police Department Fleet Services Shop in an amount not to exceed $649,999 plus a 10% contingency of $64,999 to address any unforeseen issues that may arise during construction, for a total authorized expenditure of $714,998; and
C. Authorize the City Manager, or his designee, to execute said contract and all documents required for the completion of the project and file a notice of completion at the conclusion of all construction activities.

THE FOLLOWING COUNCIL GOALS ARE BEING ACHIEVED:
Operate in a Businesslike Manner
Invest in the City's Infrastructure (Water, Streets, Sewers, Parks, Storm Drains and Public Facilities)

FISCAL IMPACT: The Fiscal Year 2021-22 Adopted Budget includes appropriations in the amount of $550,000 in the Facilities & Parks Maintenance Fund for this project. If approved, the remaining balance of $164,998 will be requested in the Fiscal Year 2021-22 Year-end Budget Update.

BACKGROUND & ANALYSIS: In partnership with the Police and Fleet Services Departments, it was determined that having a satellite fleet services shop would be beneficial for both operations. Having a satellite shop will reduce vehicle mileage, fuel costs, and maintenance needs. Additionally it will increase operational efficiency by reducing travel time for officers driving to the main fleet shop for repairs, or arranging for multiple mechanics to drive the repaired vehicles between locations. Giving Fleet Staff direct access to the Police fleet of vehicles will ensure vehicles can be serviced and repaired quicker, thus increasing the number of vehicles available to officers and increasing the amount of time the vehicles are available for use.

On January 10, 2022, the City solicited bids for the Police Department Fleet Services Shop Project and received 10 responses at the bid opening held on February 4, 2022 at 4:00 p.m.

COMPANY	LOCATION	BID AMOUNT
*Clawson Automotive Equipment	Bakersfield, CA	$179,200.12
*SAS Construction	Santa Ana, CA	$444,678.00
BCM Group, Inc.	Rancho Cucamonga, CA	$649,999.00
BBS Construction, Inc.	West Covina, CA	$688,000.00
OCS Construction Services	Riverside, CA	$704,633.00
IPI Construction	Panorama City, CA	$719,654.00
Hamel Contracting, Inc.	Murrieta, CA	$729,985.00
L M Rasmussen Construction	Alpine, CA	$734,750.00
New Millennium Construction Services	Chino Hills, CA	$757,963.11
Dalke & Sons Construction, Inc.	Riverside, CA	$838,704.90

Clawson Automotive Equipment and SAS Construction were deemed non-responsive as they did not submit the required documentation or adhere to the project specifications. Clawson Automotive Equipment submitted a bid for equipment only and SAS Construction did not submit a list of sub contractors as required in the bid documents. Staff recommends that the City Council reject the bids submitted by Clawson Automotive Equipment and SAS Construction, and award a construction contract to BCM Group, Inc. as the lowest responsible bidder. As referenced on the bid package, the lowest bid is determined based on total base bid amount.

CITY OF ONTARIO *Agenda Report* **April 19, 2022**	**SECTION:** **CONSENT CALENDAR**
Department: Information Technology Prepared By: Samantha Robles Staff Member Presenting: Colin Fernandes, Executive Director Information Technology Approved By:	Submitted To: Council/OHA Approved: _____ Continued To: _____ Denied: _____ Item No: 9

SUBJECT: AMENDMENT TO AGREEMENT WITH AXON ENTERPRISE, INC. FOR THE UPGRADE OF EQUIPMENT AND HARDWARE

RECOMMENDATION: That the City Council authorize the City Manager to execute an amendment to the existing five year agreement with Axon Enterprise, Inc., of Scottsdale, Arizona, for the purchase of new equipment including; cameras, maintenance, and data management services at an additional cost of $80,528 to the existing contract of $3,722,106, for a total not-to-exceed of $3,802,634.

THE FOLLOWING COUNCIL GOALS ARE BEING ACHIEVED:
Operate in a Businesslike Manner

FISCAL IMPACT: The amendment to the Professional Services and Equipment Purchase Agreement increases the existing five year $3,722,106 Agreement by $80,528 for a not-to-exceed contract amount of $3,802,634. These amounts will be funded through the Information Technology Fund. FY 2021-22 budget includes appropriations for the current contract year. If approved, appropriations will be added to the future years' budgets consistent with the annual adoption process.

BACKGROUND & ANALYSIS: The City currently has an agreement with Axon Enterprise, Inc. for hardware, maintenance and data management services for public safety. Axon Enterprise has a unique solution related to information collection and information storage. The City's interview room equipment has reached its serviceable end of life and needs to be replaced with new and updated equipment.

CITY OF ONTARIO *Agenda Report* **April 19, 2022**	**SECTION:** **CONSENT CALENDAR**
Department: Public Works Prepared By: Daniel P Beers Staff Member Presenting: Tito Haes, Executive Director Public Works Reviewed By: Bonnie Tam Approved By:	Submitted To: Council/OHA Approved: _____ Continued To: _____ Denied: _____ Item No: 10

SUBJECT: **A CHANGE ORDER TO THE CONSTRUCTION CONTRACT WITH DBA LETNER ROOFING CO. FOR ADDITIONAL LABOR AND MATERIALS NEEDED FOR THE SOLAR INSTALLATION PROJECT AT CITY HALL ANNEX BUILDING**

RECOMMENDATION: That the City Council take the following actions:

A. Authorize the City Manager or his designee to execute a change order in the amount of $110,298 to the original Construction Contract for DBA Letner Roofing Co. (on file with Records Management Department) for the solar improvement project at City Hall Annex Building. DBA Letner's Roofing Company's original contract value amount of $546,997 plus a 10% contingency of $54,699 for a total amount of $601,696. Additional funding of $110,298 will revise contract value to $711,994;
B. Authorize the City Manager to transfer the budget appropriations of $110,298 to the original Construction Contract for DBA Letner Roofing Co. (on file with Records Management Department) from the Library Roof Restoration Project. This additional funding will assist the solar improvement project at City Hall Annex Building as outlined in the Energy Service Agreement with Climatec, LLC (on file with Records Management Department).; and
C. Authorize the City Manager or his designee to execute said contract and authorize the filing of the notice of completion at the conclusion of all construction activities related to the project.

THE FOLLOWING COUNCIL GOALS ARE BEING ACHIEVED:
Invest in the City's Infrastructure (Water, Streets, Sewers, Parks, Storm Drains and Public Facilities)

FISCAL IMPACT: The Fiscal Year 2021-22 Adopted Budget includes $110,298 in the Capital Projects Fund for the roof replacements at City Hall Annex Building and Solar installation.

BACKGROUND & ANALYSIS: On July 21, 2020, the City Council approved an Energy Service Agreement with Climatec to provide various energy related improvements to City Facilities. On May 18, 2021, the City Council approved DBA Letner Roofing Co. to replace the City Hall Annex roof. The City assigned both Climatec and DBA Letner Roofing Co. to complete the roof replacement in

conjunction with installation of the new solar panels at the City Hall Annex Building. As the work progressed, the contractors uncovered existing site conditions which altered the scope of work. This Change Order will allow the funding needed to complete both roof replacement and Solar Photovoltaic (PV) System installation projects at the City Hall Annex Building.

CITY OF ONTARIO *Agenda Report* **April 19, 2022**	**SECTION:** **CONSENT CALENDAR**
Department: Public Works Prepared By: Bonnie Tam Staff Member Presenting: Tito Haes, Executive Director Public Works Reviewed By: Bonnie Tam Approved By:	Submitted To: Council/OHA Approved: _____ Continued To: _____ Denied: _____ Item No: 11

SUBJECT: BUDGET AMENDMENT FOR THE PURCHASE OF FLEET VEHICLES

RECOMMENDATION: That the City Council authorize a $31,000 budget amendment from the Integrated Waste Fund for the purchase of two (2) Autocar Roll Off trucks in the amount of $601,000 for the Integrated Waste Department.

THE FOLLOWING COUNCIL GOALS ARE BEING ACHIEVED:
Operate in a Businesslike Manner

FISCAL IMPACT: The total cost of the Autocar Roll Off trucks recommended for purchase is $601,000. Appropriations for the purchase of vehicles in the amount of $601,000 in the Integrated Waste Fund are included in the FY 2021-22 Budget. There is no fiscal impact to the General Fund.

BACKGROUND & ANALYSIS: At the March 1, 2022 City Council meeting, the City Council authorized the cooperative purchase and delivery of three (3) Autocar Automated Sideload trucks in the amount of $1,125,000 and two (2) Autocar Roll Off trucks in the amount of $570,000 for the Integrated Waste Department, consistent with the terms and conditions of the Sourcewell Cooperative Contract No. 060920-ATC. This was to ensure minimal service interruptions to the customers of Ontario and remain in compliance with CalRecycle's legislative bills AB 341, SB 1383, and AB 1826. To complete the purchase of the two (2) Autocar Roll Off trucks, additional budget appropriations in the amount of $31,000 is needed to pay for the document fees, tire recycling fees, and taxes that come with the proposed fleet purchase.

In general, conformation with the provisions of Government Code Section 54201 through 54204, Ontario Municipal Code Section 2-6.29 allows for the purchase of supplies and equipment through cooperative purchasing programs, pursuant to California Government Code Section 6502 and City of Ontario Resolution No. 91-141. Cooperative purchasing allows the City to pool its procurement power with other public agencies to obtain lower pricing than otherwise might be possible.

CITY OF ONTARIO *Agenda Report* **April 19, 2022**	**SECTION:** **CONSENT CALENDAR**
Department: Utilities Prepared By: Ryan Rebick Staff Member Presenting: Scott Burton, Utilities General Manager Reviewed By: Dennice Raygoza, Albert G Gastelum, Michael Sigsbee Approved By:	Submitted To: Council/OHA Approved: _____ Continued To: _____ Denied: _____ Item No: 12

SUBJECT: AN AMENDMENT TO THE ON-CALL DESIGN SERVICES AGREEMENT FOR ONTARIO MUNICIPAL SERVICES CENTER MODULAR OFFICES

RECOMMENDATION: That the City Council approve and authorize the City Manager, or his designee to execute Amendment No. 3 to the On-Call Design Service Agreement (on file in the Records Management Department) with Holt Architects, Inc. (dba Holt Architecture) of Palm Desert, California in the amount of $90,498, plus a 15% contingency of $13,575 for a total amount of $104,073.

THE FOLLOWING COUNCIL GOALS ARE BEING ACHIEVED:
Operate in a Businesslike Manner
Invest in the Growth and Evolution of the City's Economy
Invest in the City's Infrastructure (Water, Streets, Sewers, Parks, Storm Drains and Public Facilities)

FISCAL IMPACT: The Fiscal Year 2021-22 Adopted Capital Improvement Program includes appropriations from the Integrated Waste Fund, Sewer Capital Fund, and Water Capital Fund for architectural services for the Ontario Municipal Services Center (OMSC) Modular Office Project. The proposed Amendment in the amount of $90,498, plus a 15% contingency of $13,575 for a total amount of $104,073 will increase the current total not-to-exceed authorization from $230,822 to $334,895. The City and Holt Architects, Inc. (Holt) have agreed to the fixed billing rates and Holt will be compensated for the completion of the scope of work at the approved billing rates. There is no impact to the General Fund.

BACKGROUND & ANALYSIS: The OMSC building located at 1425 S. Bon View Ave. houses the Ontario Municipal Utilities Company (OMUC) and Public Works Agencies. Over the past several years, staffing positions have been filled to support the City's growing operational functions. Previous efforts to accommodate new OMUC staff included the relocation of Public Works administration staff to 1333 S. Bon View Ave. (Customer Services Center building) and remodeling of existing space to add more cubicle workstations. Despite these improvements, there is still a shortage of sufficiently sized office and meeting space for all current positions.

On May 18, 2021, City Council awarded a Goods and Services Agreement with Williams Scotsman, Inc. for the purchase of two new modular buildings. The first building is a replacement of the modular building that was utilized as the OMSC Training Center and the second is an additional building in the parking lot at 1333 S. Bon View Ave. This building provides additional office space for up to 23 staff members and a conference room that can accommodate up to 16 people.

On January 21, 2020, City Council awarded on-call architectural Design Service Agreements to Holt and thirteen other consultants. Holt and the other consultants were selected using a qualifications-based selection process. The agreements were awarded as three-year agreements with two additional one-year extensions consistent with Council approved budgets. As projects arise, Staff will request proposals from the consultants and amend original agreements with revised scopes of work and costs.

In February 2022, Staff solicited a proposal from Holt to produce a set of plans to submit to the Building and Planning Departments for approval. The package will include site plans that will show compliance with the Americans with Disabilities Act, parking lot circulation, and service connections to the modular offices. Issuance of the building permits will allow Staff to begin utilizing and occupying the buildings.

Staff recommends the Amendment to Holt based on their expertise, ability to perform the work in a timely manner, and successful past performance of this type of work.

CITY OF ONTARIO *Agenda Report* **April 19, 2022**	**SECTION:** **CONSENT CALENDAR**
Department: Economic Development Prepared By: Jennifer Hiramoto Staff Member Presenting: Jennifer McLain Hiramoto, Economic Development Director Approved By:	Submitted To: Council/OHA Approved: _____ Continued To: _____ Denied: _____ Item No: 13

SUBJECT: REAL PROPERTY EXCHANGE BETWEEN THE CITY OF ONTARIO AND THE UNIVERSITY OF LA VERNE

RECOMMENDATION: That the City Council adopt a Resolution:

A. Declaring certain City-owned real property to be exempt surplus land;
B. Approving a real property exchange agreement with the University of La Verne;
C. Authorizing the City Manager to take all actions necessary with respect thereto; and
D. Finding that no further CEQA analysis is necessary

THE FOLLOWING COUNCIL GOALS ARE BEING ACHIEVED:
Invest in the Growth and Evolution of the City's Economy
Operate in a Businesslike Manner
Focus Resources in Ontario's Commercial and Residential Neighborhoods

FISCAL IMPACT: As this is an exchange of properties, there is no fiscal impact at this time. However, there may be future fiscal impacts if the University of La Verne ("ULV") exercises the financing options, as detailed in Sections 7.2 and 7.3 of the Real Property Exchange Agreement and Joint Escrow Instructions ("Agreement").

BACKGROUND & ANALYSIS:

BACKGROUND: On October 21, 2021, the City of Ontario (“the City”) and the University of La Verne (“ULV”) executed a Memorandum of Understanding (“MOU”) to explore the viability of exchanging properties for the purpose of expanding the City of Ontario’s Civic Center campus while enabling ULV to expand its footprint within the City of Ontario.

ULV envisions an innovation and education corridor within the City of Ontario, one that builds upon both the proximity of its main campus in La Verne and the University of La Verne College of Law building in the heart of Downtown Ontario. ULV’s future expansion plans in Ontario includes the development of a new College of Health campus as well as the Randall Lewis Center for Innovation,

Social Impact and Entrepreneurship.

The City, for its part, envisions a robust Civic Center Campus – one that modernizes facilities for public employees, brings more people to the downtown area, and better utilizes all space in the downtown core. The City expansion project ("Expansion Project") is anticipated to include the Ontario Montclair-School District headquarters, a modern City Annex, which would centralize City Hall services, a 700-space parking structure, a new state-of-the-art fire station, and a College of Health.

This MOU enabled the City and ULV an opportunity to negotiate terms in good faith. On March 22, 2022, the Planning Commission adopted a Resolution finding that the proposed uses of the properties are consistent with the General Plan.

ANALYSIS: With the Planning Commission's adoption of a Resolution making the appropriate General Plan consistency findings, and the ULV and City negotiations completed, the next step is to enter into a Real Property Exchange. City Staff is recommending the following terms that would ultimately result in the exchange between three separate City-owned parcels for one ULV-owned site.

In exchange for three-City owned properties detailed below, ULV agrees to deed the City the following parcel:

- **ULV Parking Lot**
    - Description**:** Approximately 2.4-acre parking lot, at the southwest corner of Sultana Avenue and D street (APN: east portion of 1048-541-15).
    - Purpose: The acquisition of this lot will enable the City to relocate and construct a modernized Fire Station, currently located at the northwest corner Sultana and "B" Street. A portion of the ULV Parking Lot will also serve as the future location of a 700-space parking structure that will serve all users within the Civic Center Campus.
    - Term: The property will be conveyed following close of a 30-day escrow period.

In exchange for the ULV Parking Lot, the City of Ontario will agree to exchange or sell the properties below to ULV:

- **Fire Station 1**
    - Description: Approximately 0.52 acres at the northwest corner of Sultana Avenue and "B" Street (APN: Portion of 1048-545-16), which is currently developed as the City's Fire Station No. 1.
    - Purpose: ULV intends to construct a College of Health campus at this site.
    - Term: Upon completion of construction of the new FS1 site and relocation of all personnel, the City will deliver the site as "shovel ready," including demolishing the property. ULV must adhere to all development processes and standards, including paying applicable fees.
- **Founders Garden**
    - Description: Approximately 13 acres located on the north and south side of Inland

Empire Boulevard approximately 2,641 feet west of Haven Avenue, addressed as 3995 and 4040 Inland Empire Boulevard (APNS: 0210-205-03 and 0210-211-23).
    - Purpose: Future uses are undermined at this time. Any future improvement or enhancement would require a development entitlement to be reviewed and approved by the appropriate hearing body and must occur within three years of a signed Exchange Agreement. If this does not occur during this time frame, the property will be conveyed back to the City.
    - Term: The property will be conveyed following close of escrow.
- **Emporia Block**
    - Description: Approximately 1.4 acres located at the northwest corner of Emporia Street and Laurel Avenue, addressed at 208 and 228 West Emporia, 200, 211 and 221 South Laurel Avenue (APNS: 1049-056-05, 1049-056-06, 1049-056-01, 1049-056-02, 1049056-03 and 1049-056-04).
    - Purpose: ULV intends on utilizing this building, parking lot and vacant land as the future Randall Lewis Center for Innovation, Entrepreneurship and Social Impact.
    - Term: ULV has an option to purchase this property within a five-year time frame at the current (2022) fair market value.

Other notable terms of the Agreement include:

- Surplus Land Act: The City-Exchange Properties, to the extent they are no longer necessary for the City's use, and the Parties' exchange thereof are exempt from the Surplus Land Act (Government Code Section 54220, *et seq.*) (the "Surplus Land Act"), pursuant to Section 54221(f)(1)(C) of the Surplus Land Act.
- Financing: The City agrees to lend ULV up to $40 million to partially finance the ULV Expansion project. The details of the financing shall be negotiated and memorialized in future loan documents.

In summary, the proposed transfer and acquisition of the properties is in the City's best interest because it achieves the City's goals of attracting workforce population to the downtown area, removing blight, activating underutilized assets in the City, and incentivizing the development of a pipeline of talent that adds more high paying wage jobs to the City. Therefore, Staff recommends that the City Council enter into this Real Property Exchange Agreement and Joint Escrow Instructions.

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, (I) DECLARING CERTAIN CITY-OWNED REAL PROPERTY TO BE EXEMPT SURPLUS LAND; (II) APPROVING A REAL PROPERTY EXCHANGE AGREEMENT WITH THE UNIVERSITY OF LA VERNE; (III) AUTHORIZING THE CITY MANAGER TO TAKE ALL ACTIONS NECESSARY WITH RESPECT THERETO; AND (IV) FINDING THAT NO FURTHER CEQA ANALYSIS IS NECESSARY.

WHEREAS, the City of Ontario (the "City") owns in fee simple the following real property within the City: (i) 3995 and 4040 Inland Empire Blvd. (a.k.a. Founder's Garden Land Parcels) (APNs: 0210-205-03 and 0210-211-23, respectively) (together, the "View Corridor"); (ii) the northwest corner of Sultana and B Streets (APN: portion of 1048-541-15), on which is currently constructed the City's Fire Station No. 1 (the "FS1 Site"); and (iii) 208 W. Emporia St. (the "Option Property"); and

WHEREAS, the University of La Verne ("ULV") desires to acquire the View Corridor and the FS1 Site (together, the "City-Exchange Properties") and potentially the Option Property in order to realize its vision of an innovation and education corridor within the City of Ontario – one that builds upon the proximity of its main campus and the University of La Verne College of Law building in the heart of downtown Ontario; and

WHEREAS, the City is willing to convey the City-Exchange Properties (and potentially the Option Property) in exchange for certain real property owned in fee simple by ULV (the "ULV Parking Lot" and together with the City-Exchange Properties, the "Properties"), pursuant to the terms and conditions of that certain Real Property Exchange Agreement and Joint Escrow Instructions, a form of which is attached hereto as Exhibit A (the "Agreement"); and

WHEREAS, the City desires to acquire the ULV Parking Lot for development of its own expansion project, which includes, among other components, (i) a 700-space, three (3)- to four (4)-level parking structure for, *e.g.*, City vehicles, employee parking, and public parking; and (ii) a new state-of-the-art fire station – both to be developed on the ULV Parking Lot; and

WHEREAS, the City-Exchange Properties and Option Property are not necessary for the City's use; and

WHEREAS, the City has determined that, pursuant to Government Code sections 37350 and 37351, exchanging the City-Exchange Properties (and potentially the Option Property) for the ULV Parking Lot according to the terms and conditions of the Agreement is for the common benefit and in the best interests of the City and its residents.

WHEREAS, on March 22, 2022, pursuant to Government Code section 65402, the Planning Commission adopted a resolution finding that the proposed disposition of the City-Exchange Properties and Option Property pursuant to the terms of the Agreement is consistent with the City's General Plan.

NOW, THEREFORE, THE CITY DOES HEREBY RESOLVE AND DECLARE AS FOLLOWS:

SECTION 1. Recitals. The above recitals are true and correct and incorporated into this Resolution by reference.

SECTION 2. Finding of Exemption from Surplus Land Act. The City hereby finds that the City-Exchange Properties and the Option Property are exempt surplus land pursuant to Section 54221(f)(1)(C) of the Surplus Land Act (Government Code section 54220 *et seq.*) (the "Act"), because they are part of an exchange of real property between the City and ULV, and the land to be received by the City from ULV is necessary for the City's use.

SECTION 3. Approval of Agreement. The City Council hereby approves the Agreement in substantially the form attached hereto as Exhibit A and on file with the City Clerk, together with such additions thereto and changes therein as the City Attorney shall deem necessary, desirable or appropriate, the execution of which by the City Manager shall be conclusive evidence of the approval of any such additions and changes.

SECTION 4. City Manager Authorization. The City Manager is hereby authorized and directed to execute, and the City Clerk is hereby authorized and directed to attest to the final form of the Agreement for and in the name and on behalf of the City. The City Council hereby authorizes the delivery and performance of the Agreement. The City Manager and his designees are hereby authorized and directed to do any and all things, to execute and deliver any and all documents, which, in consultation with staff and the City Attorney, they may deem necessary or advisable in order to effectuate the purposes of this Resolution, and any such actions previously taken by such officers are hereby ratified and confirmed.

SECTION 5. CEQA. The California Environmental Quality Act (Pub. Res. Code § 21000 *et seq.*) ("CEQA") does not apply here, because declaration of the City-Exchange Properties and the Option Property as exempt surplus land under the Act, approval of the Agreement, and authorization of the City Manager to execute the Lease do not constitute a "project" as defined in Cal. Code Regs. tit. 14 ("CEQA Guidelines") § 15378, in that such actions, taken as a whole, have no "potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment." In the alternative, even if such actions constitute a "project," they are exempt under CEQA Guidelines § 15061(b)(3), because they have no "potential for causing a significant effect on the environment."

SECTION 6. Effective Date. This Resolution shall take effect upon adoption.

The City Clerk of the City of Ontario shall certify as to the adoption of this Resolution.

PASSED, APPROVED, AND ADOPTED this 19th day of April 2022.

_____
PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO FORM:

_____
BEST BEST & KRIEGER, LLP
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. 2022- was duly passed and adopted by the City Council of the City of Ontario at their regular meeting held April 19, 2022 by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

The foregoing is the original of Resolution No. 2022- duly passed and adopted by the Ontario City Council at their regular meeting held April 19, 2022.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

REAL PROPERTY EXCHANGE AGREEMENT AND JOINT ESCROW INSTRUCTIONS

Between

UNIVERSITY OF LA VERNE

and

THE CITY OF ONTARIO

Effective Date: _____,

DRAFT

DRAFT

REAL PROPERTY EXCHANGE AGREEMENT AND JOINT ESCROW INSTRUCTIONS

THIS REAL PROPERTY EXCHANGE AGREEMENT AND JOINT ESCROW INSTRUCTIONS ("Agreement") is entered into this _____ day of _____, 2022 ("Effective Date") by and between the **UNIVERSITY OF LA VERNE**, a California non-profit corporation ("ULV") and the **CITY OF ONTARIO**, a California municipal corporation ("City"). ULV and City are sometimes hereinafter referred to individually as a "Party" and collectively as the "Parties."

RECITALS

A. ULV owns that certain real property located at or about 320 East "D" Street (APN: 1048-541-15) within the City, as more particularly described in **Exhibit "A"** attached hereto and incorporated herein consisting of an approximate 50,000 sq.ft building, parking lots on the west and east side of the on-site building ("the ULV College of Law"). Subject to paragraph 7.5 and the applicable terms of this Agreement, ULV desires to allow the City to undertake the effort and costs necessary to split the eastern parking lot into a separate legal parcel which shall hereinafter referred to as the "ULV Parking Lot". The ULV Parking Lot shall be more particularly described and set forth in **Exhibit "A-1"** attached hereto and incorporated herein; and

B. The City owns (i) those two 6.715-acre and 6.29-acre parcels of real property located at 3995 and 4040 Inland Empire Blvd., respectively, within the City (a.k.a. Founder's Garden Land Parcels) (APNs: 0210-205-03 and 0210-211-23, respectively), as more particularly described in **Exhibit "B-1"** attached hereto and incorporated herein by reference (together, the "View Corridor"); (ii) that certain real property located at the northwest corner of Sultana and B Streets in the City (APN: portion of 1048-541-15), on which is currently constructed the City's Fire Station No. 1, as more particularly described in **Exhibit "B-2"** attached hereto and incorporated herein by reference ("FS1 Site"); and (iii) that certain real property located at 208 W. Emporia St. in the City, as more particularly described in **Exhibit "B-3"** attached hereto and incorporated herein by reference (the "Option Property"). The View Corridor and the FS1 Site, together, shall be called the "City-Exchange Properties,"; the ULV Parking Lot and the City-Exchange Properties, together, shall be called the "Properties"; and the Properties and the Option Property may be individually called a "Property"; and

C. ULV desires to acquire the City-Exchange Properties (and potentially the Option Property) in order to realize its vision of an innovation and education corridor within the City of Ontario – one that builds upon the proximity of its main campus and the University of La Verne College of Law building in the heart of downtown Ontario. ULV's future expansion plans include development of a new College of Health campus ("ULV College of Health"), anticipated enhancement of the View Corridor, as well as the Randall Lewis Center for Innovation, Social Impact and Entrepreneurship (together, the "ULV Expansion Project").

D. The City believes that the exchange of the Properties (the "Exchange") and the ULV Expansion Project are in the City's best interests, because they achieve the City's goals of

attracting workforce population to the downtown area, removing blight, activating underutilized assets in the City, and incentivizing the development of a pipeline of talent that adds more high-paying jobs to the City; and

E. The City, for its part, envisions a robust Civic Center Campus – one that modernizes facilities for public employees, brings more people to the downtown area, and better utilizes all space in the City's downtown core (the "City Expansion Project" and together with the ULV Expansion Project, the "Expansion Projects"). The City Expansion Project is anticipated to include the Ontario Montclair-School District ("OMSD") headquarters, a modern City Annex, which would centralize City Hall services, and (relevant to this Agreement) (i) a 700-space, three (3)- to four (4)-level parking structure, which would house City vehicles and employee parking, OMSD employee parking, ULV College of Law/Health employee parking, and public parking for users/customers of all three entities (the "Parking Structure"); and (ii) a new state-of-the-art fire station (the "New Fire Station") – both to be developed on the ULV Parking Lot; and

F. In order to finance the ULV Expansion Project, the City has agreed in principle to lend ULV money to partially finance the ULV Expansion Project, and in consideration, ULV has agreed in principle to convey a post-Exchange mortgage interest in certain City-Exchange Properties, as well as other non-Exchange properties owned by ULV to be mutually agreed upon.

G. The City-Exchange Properties, to the extent they are no longer necessary for the City's use, and the Parties' exchange thereof are exempt from the Surplus Land Act (Government Code Section 54220, *et seq.*) (the "Surplus Land Act"), pursuant to Section 54221(f)(1)(C) of the Surplus Land Act.

A G R E E M E N T

Based upon the foregoing Recitals, which are incorporated herein by this reference, and for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, ULV and City agree as follows:

1. EXCHANGE OF PROPERTIES.

1.1 Agreement to Exchange. Subject to all the terms, conditions, and provisions of this Agreement, and for the consideration herein set forth, ULV and City agree to exchange title to their respective Properties, each including, without limitation, such Party's interest in all mineral, oil, gas and other hydrocarbon substances on and under the properties as well as all development rights, air rights, water, water rights and water stock relating to the Properties and any other easements, rights-of-way or appurtenances, used in connection with the beneficial use and enjoyment of the Properties.

1.2 FS1 Site. Upon completion of construction of and the City's relocation to the New Fire Station, and subject to Section 7.1, City shall, at its sole cost and expense, demolish and clear all improvements on the FS1 Site and deliver fee title to the FS1 Site to ULV as vacant land. This Section 1.2 shall survive until the end of the Application Period (as defined in Section 7.1).

2. INSPECTIONS AND REVIEW.

2.1 Delivery of Due Diligence Materials. Within ten (10) days of the Effective Date, the Parties shall deliver to each other, without representation or warranty of completeness or accuracy, copies of the documents, reports, agreements, or other items, of material significance to their respective Properties, in their respective possession, custody or control and which may include the following (collectively, the "Due Diligence Materials"): (i) all licenses, leases, and permits affecting or relating to the ownership, subdivision, possession or development of the Properties or the construction of improvements thereon, and all amendments and modifications thereto; (ii) applications and correspondence or other written communications to or from any Governmental Authority (as defined below) regarding any permit, approval, consent or authorization with respect to the development of the Properties or the construction of improvements thereon; (iii) the most recent survey, if any, pertaining to the Properties or any portion thereof; and (iv) soils reports, engineering data, environmental reports, and other data or studies pertaining to the Properties or any portion thereof.

2.2 Assumption of Risk. Any Due Diligence Materials shall be provided to the other Party without any recourse or liability of any type or nature. Each Party assumes all risk of any kind with regard to the use of and reliance upon any of the Due Diligence Materials provided by the other Party. Neither Party is relying upon the other Party for any information related to, concerning, or involving the respective properties for this transaction, including, without limitation, the monetary value of the Properties.

2.3 Inspections. The Parties and their respective representatives, agents, engineers, consultants, contractors, and designees shall have the right to enter onto each other's Properties from and after the date of this Agreement through the Closing for purposes of examining, inspecting and investigating the other's Properties, including the site, soil, subsurface soils, drainage, seismic and other geological and topographical matters, location of asbestos, toxic substances, hazardous materials or wastes, if any, and, in each Party's sole and absolute discretion, determining whether the other's Properties are acceptable to them. Prior to entering the Properties, the entering Party (the "Entering Party") shall provide the welcoming Party (the "Welcoming Party") with at least twenty-four (24) hour written notice identifying the date and time of the planned inspection. The Welcoming Party will permit the Entering Party's planned inspection unless the planned inspection will interfere with a previously planned Welcoming Party activity or event in which case the Parties shall work together in good faith to identify another mutually convenient date or time as soon as possible. Both Parties shall have the right, for any reason and at any time on or before the date that is one hundred twenty (120) days after the Effective Date (the "Due Diligence Period"), to terminate this Agreement by delivering a written notice of such termination to the other Party and Escrow Agent.

2.4 Repair; Indemnification. The Entering Party shall, in a timely manner, repair any and all damage to the Welcoming Party's Properties caused by any inspection or investigation described herein, to a condition substantially the same as the condition of the Welcoming Party's Properties prior to such inspection or investigation. The Entering Party shall hold harmless, defend and indemnify the Welcoming Party and all of the principals, members, agents and partners of the

Welcoming Party from any loss, expense (including attorney's fees), liability or cost which arises due to or out of any inspection by said Party. The foregoing indemnity shall survive the close or the termination of this transaction.

2.5 As-Is. Based on the inspection rights set forth in the preceding paragraph and in reliance on the due diligence of each Party, ULV and City acknowledge and agree that except for the limited warranties and representations expressly set forth in this Agreement, the exchange of the Properties is made solely on an AS IS WHERE IS BASIS, WITH ABSOLUTELY NO REPRESENTATIONS OR WARRANTIES, EXPRESSED OR IMPLIED. But for the foregoing understanding and agreement, the Parties would not have entered into this transaction. Each Party acknowledges that due to the expertise, experience and business acumen of both Parties and their respective consultants, each Party has the ability to conduct a complete and through due diligence of the respective Properties and would not close the transaction unless totally satisfied with the respective Property, and has otherwise conducted an exhaustive and complete due diligence which would enable the taking of the respective Property in an AS IS WHERE IS BASIS WITH ABSOLUTELY NO REPRESENTATIONS OR WARRANTIES, EXPRESSED OR IMPLIED.

2.6 Title Review. During each Parties' respective Due Diligence Period, each Party shall obtain a preliminary title report for each respective Property, together with copies of all written instruments creating the exceptions specified therein, and plat maps plotting all easements specified therein (collectively, the "Title Reports"). The Parties shall notify one another in writing (each, an "Objection Notice") on or before the expiration of the Due Diligence Period of any objections they may have to the title exceptions contained in the respective Title Report for the Properties. A Party's failure to provide an Objection Notice within said period shall constitute such Party's approval of all exceptions to title shown on the respective Title Report for the Properties. Upon receipt of an Objection Notice, the receiving Party (the "Receiving Party") shall have a period of ten (10) days after receipt of the objecting Party's (the "Objecting Party") Objection Notice in which to deliver written notice to the Objecting Party ("Objection Response") of the Receiving Party's election to either (i) agree to remove or cure the objected to items prior to the Close of Escrow, or (ii) decline to remove or cure any such title exceptions and, at the Receiving Party's discretion, terminate Escrow and this Agreement. If the Receiving Party notifies the Objecting Party of its election to terminate Escrow rather than remove and cure the objected to items, the Objecting Party shall have the right, by written notice delivered to the Receiving Party within ten (10) days after the Objecting Party's receipt of the Objection Response, to agree to accept the respective Property subject to the objected to items, in which event the Receiving Party's election to terminate the Escrow shall be of no effect, and the Objecting Party shall take title at the Close of Escrow subject to such objected to items without any adjustment to the Exchange. The Receiving Party may cure any objection by acquiring, at the Receiving Party's expense, a title insurance endorsement related to the objected to exception, reasonably acceptable to the Objecting Party. Any extension of the time to review the Title Report for a Property subject to an Objection Notice shall only occur in strict accordance with the following paragraph.

2.7 Review of Amendments and Supplements. Upon the issuance of any amendment or supplement to the Title Report by the Receiving Party for a Property which adds additional exceptions, or adds any new requirement, the foregoing right of review and approval by the Objecting Party shall also apply to said amendment or supplement; provided, however, that the

Objecting Party's period of review and approval or disapproval of any such additional exceptions shall be limited to fifteen (15) business days following the Objecting Party's and its counsel's receipt of the instrument(s) creating such additional exceptions. The foregoing extension shall only be allowed for and pertain to the review of the new matter and the Objecting Party shall not be entitled to object to any previously known exception or requirement for which the time for objection has expired.

2.8 Removal of Certain Exceptions. Notwithstanding anything else stated in this Agreement, in all events, the Parties shall satisfy and otherwise remove all monetary and financial liens and encumbrances on their respective Property/Properties in existence as of the Effective Date or incurred on or before Closing (other than current taxes, if any not yet due). In addition, the Parties shall, except as may be otherwise specifically set forth in this Agreement, terminate all leases, possessory agreements, licenses, and operating agreements that affect the respective Properties and cause all parties-in-possession title exceptions shown on the Title Report, if any, to be deleted, and neither Party need object to any such matters.

2.9 Governmental Approvals. During the course of the Escrow, each Party shall be entitled to seek all necessary approvals from any applicable governmental authorities, quasi-governmental authorities, and/or utility providers and regulators (collectively, "Governmental Authorities" and the approvals, collectively, the "Government Approvals") necessary to utilize the Properties they will receive via this Exchange in any way they see fit. The Parties shall reasonably cooperate with each other to support their efforts to obtain each other's Governmental Approvals and shall timely execute any and all applications, consents, and other documents reasonably requested by the other Party in connection therewith.

3. ESCROW.

3.1 Opening of Escrow. Within five (5) business days following the Effective Date, the Parties shall open an escrow (the "Escrow") with First American Title Company ("Escrow Holder"), at its offices located at 18500 Von Karman Avenue, Suite 600, Irvine CA 92612, Attn: Jeanne Gould, Escrow Officer, by causing a fully executed copy of this Agreement to be deposited with Escrow Holder (the "Opening of Escrow"). Escrow Holder shall provide each of the Parties in Section 7.3 with written confirmation of the date of the Opening of Escrow. First American Title Company (the "Title Company") shall also provide title insurance services related to this Agreement.

3.2 Close of Escrow; Closing Date. Escrow shall close on or prior to the date which is thirty (30) days after the conclusion of the Due Diligence Period, unless mutually extended by both Parties, provided that the conditions to Closing described in Section 4 below have been satisfied or waived (the "Closing Date"). The terms the "Close of Escrow", and/or the "Closing" are used herein to mean the date the Grant Deeds (as the term is defined in Section 3.5 herein) are recorded in the Office of the County Recorder of the County of San Bernardino (the "Official Records").

3.3 Possession. Respective possession of the Properties shall be delivered to each Party at the Close of Escrow, free and clear of all liens, encumbrances, tenancies, lessees, occupants,

licensees, and all possessory rights of any kind or nature, except for any Permitted Exceptions, as set forth and defined in Section 4.1.3.

3.3 Joint Escrow Instructions. This Agreement, together with any standard instructions of Escrow Holder, shall constitute the joint escrow instructions of the Parties to Escrow Holder. In the event of any conflict between the provisions of this Agreement and Escrow Holder's standard instructions, this Agreement shall prevail.

3.4 Deliveries by City. No later than 1:00 p.m. on the business day preceding the Closing Date, City shall deliver to Escrow Holder:

(a) a grant deed for the View Corridor in the form of **Exhibit "C-1"** attached to this Agreement (the "View Corridor Grant Deed"), conveying to ULV City's fee simple title to the View Corridor, duly executed and acknowledged by City;

(b) a Certificate of Acceptance for the ULV Parking Lot Grant Deed (defined below) in the form attached hereto as **Exhibit "C-2"** attached to this Agreement;

(c) Subject to paragraph 1.2, a grant deed for the property and site referred to herein as "FS1 Site" in the form of Exhibit "C-3" attached to this Agreement (the "FS1 Site Grant Deed"), conveying to ULV City's fee simple title to the FS1 Site, duly executed and acknowledged by City;

(d) a Certificate of Non-Foreign Status in the form attached hereto as **Exhibit "C-4"**;

(e) a California Franchise Tax Board Form 590-RE;

(f) any and all other documents required by Escrow Holder to carry out and close the Escrow pursuant to this Agreement, including City's portion of Escrow fees and prorations, if any.

3.5 Deliveries by ULV. No later than 1:00 p.m. on the business day preceding the Closing Date, ULV shall deliver to Escrow Holder:

(a) a grant deed in the form of **Exhibit "D"** attached to this Agreement (the "ULV Parking Lot Grant Deed" conveying to City ULV's fee simple title to the ULV Parking Lot, duly executed and acknowledged by ULV;

(b) All other documents required by Escrow Holder to carry out and close the Escrow pursuant to this Agreement, including ULV's portion of Escrow fees and prorations, if any.

3.6 Closing, Recording and Disbursements. On or before the Closing Date, and when

all of the conditions precedent to the Close of Escrow set forth in Section 4 of this Agreement have been satisfied or waived in writing, Escrow Holder shall take the actions set forth in this Section 3.6.

3.6.1 Recording. Escrow Holder shall cause the Grant Deeds to be recorded in the Official Records.

3.6.2 Title Policy. Escrow Holder shall deliver to both Parties a commitment to issue Title Policies for the respective Properties, as referred to in Section 4.1.3 of this Agreement.

3.6.3 Delivery of Documents. Escrow Holder shall deliver to the respective Parties a conformed copy of the respective Grant Deeds, and any other documents (or copies thereof) deposited by the other Party with Escrow Holder pursuant to this Agreement. The originals of the Grant Deeds shall be returned to the respective Parties after recordation.

3.6.4 Real Property Taxes. All non-delinquent general and special real property taxes and assessments shall be prorated as of the Close of Escrow.

3.7 Payment of Costs. The Parties shall be responsible for payment of all applicable documentary transfer taxes and costs associated with recording the Grant Deeds for the respective Properties they are acquiring. The Parties shall also be responsible for all title insurance premiums for the respective CLTA standard owner's form policy for the respective Properties they are acquiring, as well as all charges associated with the title insurance premiums for any additional cost of obtaining any additional coverage requested by a Party, including the difference between a CLTA standard owner's policy and an ALTA extended owner's policy. The Parties shall share the Escrow fees or Escrow Holder's termination fees, as applicable, 50-50, unless the termination is caused by one Party's default (pursuant to Section 6), in which case the defaulting Party shall be liable for all outstanding Escrow fees, including Escrow termination fees. The Parties shall, subject to Section 7.2, each be responsible for their respective attorneys' fees. All other costs of Escrow not specifically allocated in this Agreement shall be shall split equally among the Parties.

4. CONDITIONS PRECEDENT TO CLOSE OF ESCROW.

4.1 Conditions to ULV's Obligations. ULV's obligation to close the Exchange shall be subject to the satisfaction or written waiver by ULV of each of the conditions precedent set forth in this Section 4.1.

4.1.1 City's Performance. City is not in default of any term or condition of this Agreement. In the event ULV alleges that City is in default, ULV shall notify City in writing and describe the alleged default in detail. City shall have a reasonable time, but not less than fifteen (15) days, to cure any alleged default.

4.1.2 City Deliveries Made. City has deposited with Escrow Holder all documents required of City by this Agreement.

4.1.3 Title Policy. Title Company has committed to issue to ULV a CLTA

standard, or at ULV's choice, an ALTA extended coverage owner's policy of title insurance ("Title Policy"), showing fee title to the City-Exchange Properties vested in ULV, subject only to:

(a) the standard printed exceptions and exclusions contained in the form of the Title Policy commonly used by Title Company;

(b) title exceptions approved by ULV pursuant to Section 2.6 and 2.7 of this Agreement;

(c) title exceptions resulting from documents being recorded or delivered through Escrow pursuant to this Agreement; and

(d) any other exceptions approved in writing by ULV in its sole and absolute discretion.

The terms of sub-sections (a) through (d), inclusive, being herein collectively referred to as "Permitted Exceptions."

4.1.4 Representations and Warranties. All representations and warranties made by City in this Agreement, to the best of City's actual knowledge, are true and correct as of the Closing as though made at that time.

4.2 Conditions to City's Obligations. City's obligation to close the Exchange shall be subject to the satisfaction or written waiver by City of each of the conditions precedent set forth in this Section 4.2.

4.2.1 ULV's Performance. ULV is not in default of any term or condition of this Agreement. In the event City alleges that ULV is in default, City shall notify ULV in writing and describe the alleged default in detail. ULV shall have a reasonable time, but not less than fifteen (15) days, to cure any alleged default.

4.2.2 ULV Deliveries Made. ULV has deposited with Escrow Holder all documents required of ULV by this Agreement.

4.2.3 Title Policy. Title Company has committed to issue to City a CLTA standard, or at City's choice, an ALTA extended coverage owner's policy of title insurance ("Title Policy"), showing fee title to the ULV Parking Lot vested in City, subject only to:

(a) the standard printed exceptions and exclusions contained in the form of the Title Policy commonly used by Title Company;

(b) title exceptions approved by City pursuant to Section 2.6 and 2.7 of this Agreement;

(c) title exceptions resulting from documents being recorded or delivered through Escrow pursuant to this Agreement; and

(d) any other exceptions approved in writing by City in its sole and absolute discretion.

The terms of sub-sections (a) through (d), inclusive, being herein collectively referred to as "Permitted Exceptions."

4.2.4 Representations and Warranties. All representations and warranties made by ULV in this Agreement, to the best of ULV's actual knowledge, are true and correct as of the Closing as though made at that time.

4.2.5 No Challenges. There shall not be pending any challenge to the validity of this Agreement or the Exchange contemplated herein, including but not limited to any challenges pursuant to the Surplus Land Act.

4.3 Hazardous Materials; Environmental Compliance. As a result of the Parties' respective inspections pursuant to Section 2.3 herein, each Party intends to satisfy itself that the Properties, as applicable, are not in violation of any federal, state, or local law, ordinance, or regulation relating to Hazardous Materials, industrial hygiene, or to the environmental conditions on, under, or about the respective Properties, or any portion thereof, including, but not limited to, soil and groundwater conditions (together, "Environmental Laws"). If, at any time prior to the expiration of the Diligence Period, a Party determines that a Property it is intending to acquire, or any portion thereof, is in violation of said Environmental Laws, such Party may elect to terminate this Agreement and cancel the Escrow by delivering written notice to that effect to the other Party and Escrow Holder, thereby rendering this entire Agreement invalid, void, and unenforceable. The term "Hazardous Materials" when used in this Agreement shall mean any hazardous waste, hazardous substance, hazardous materials or toxic substances as defined, as of the Closing Date, in any federal, state, or local statute, ordinance, rule, or regulation applicable to the Property, including, without limitation, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (Title 42 United States Code sections 9601-9675), the Resource Conservation and Recovery Act (Title 42 United States Code sections 6901-6992k), the Carpenter-Presley-Tanner Hazardous Substance Account Act (Health and Safety Code sections 25300-25395), Hazardous Waste Control Law (Health and Safety Code section 25100-25250.25); the Hazardous Materials Transportation Act, as amended (Title 49 United States Code Sections 1801-1819); and any substance defined as "hazardous waste" in Health and Safety Code Section 25117 or as a "hazardous substance" in Health and Safety Code Section 25316, and in the regulations adopted and publications promulgated under these laws. "Hazardous Materials" shall also include asbestos or asbestos-containing materials, radon gas, and petroleum or petroleum fractions, whether or not defined as a hazardous waste or hazardous substance in any such statute, ordinance, rule, or regulation as of the Closing Date.

4.4 Satisfaction of Conditions. Where satisfaction of any of the foregoing conditions requires action by a Party, such Party shall use its diligent best efforts, in good faith, and at its own cost, to satisfy such condition. Where satisfaction of any of the foregoing conditions requires the approval of a Party, such approval shall be granted in such Party's sole and absolute discretion.

4.5 Waiver. The Parties may at any time or times, at their respective election, waive any of the conditions set forth in Sections 4.1 or 4.2, as applicable, but any such waiver shall be effective only if contained in a writing signed by the waiving Party and delivered to the other Party.

4.6 Termination. Subject to Section 6.1, in the event all of the conditions set forth in Sections 4.1 and 4.2 are not timely satisfied or waived, the Party whose conditions are not satisfied may, at its option, terminate this Agreement and the Escrow (unless the failure of such condition is due to a default on the part of City in which case ULV may exercise the remedies set forth in Section 6 below), thereby releasing the Parties from further obligations related to the Exchange of the Properties hereunder. Furthermore, in the event this Agreement is terminated by either Party, all documents delivered by any Party to Escrow Holder shall be returned within a reasonable time to the original Party. Nothing in this Section 4.6 shall be construed as releasing any Party from liability for any default of its obligations hereunder or breach of its representations and warranties under this Agreement occurring prior to the termination of this Agreement and/or the Escrow to be opened hereunder.

5. REPRESENTATIONS AND WARRANTIES-BROKERAGE COMMISSIONS.

5.1 Representations and Warranties. The Parties hereby make the following representations and warranties to one another, each of which (i) is material and relied upon by the other in making their respective determinations to enter into this Agreement, (ii) is to the best of each Party's actual knowledge true in all respects as of the Effective Date and shall be true in all respects on the Closing Date, and (iii) shall survive the Close of Escrow for one (1) year:

(a) Each Party has the full right, power, and authority to enter into this Agreement and to perform ULV's obligations hereunder. This Agreement and all other documents delivered by one Party to the other now or at the Close of Escrow, have been or will be duly executed and delivered by such Party and are legal, valid, and binding obligations of such Party, sufficient to convey to the other Party good and marketable title to the respective Properties, are enforceable in accordance with their respective terms, and do not materially violate any provision of law or any agreement to which such Party is a party.

(b) Other than those matters actually known and disclosed by the Parties as of the Effective Date, there are no pending or known threatened actions, suits, writs, injunctions, decrees, legal proceedings or governmental investigations against or affecting the Properties or relating to the ownership, maintenance, use or operation of the Properties.

(c) Other than those matters actually known and disclosed by the Parties as of the Effective Date, neither Party has received any written notices nor has any actual knowledge of any violation of any laws, ordinances, rules, regulations or requirements of any Governmental Authority affecting or relating to the Properties.

(d) Other than those matters actually known and disclosed by the Parties as of the Effective Date, there are no written leases, rights of first refusal, or other agreements relating to the right of possession and/or occupancy of any of the Properties by any person or entity, except for matters of record approved by such Party pursuant to Sections 2.6 and 2.7 above.

(e) Other than those matters actually known and disclosed by the Parties as of the Effective Date, to the best of each Party's actual knowledge, neither the Properties nor the Parties are in violation of any applicable Federal, State or local statute, ordinance, order, requirement, law, or regulation materially adversely affecting the Properties or construction of any improvement thereon. Neither Party has received a written notice of any such violation of applicable law. The Parties shall make their own independent determination of the feasibility of the use of the respective Properties they seek to acquire for their intended use.

(f) Neither Party has personally caused or knowingly permitted any contamination by Hazardous Materials (as defined in Section 4.3 of this Agreement) to occur on, at, about, or within their respective Properties, or any portion thereof, or otherwise knows of any such contamination of Hazardous Materials on, at, about, or within their respective Properties, or any portion thereof.

5.2 Duty to Notify of Changed Circumstances; "Knowledge". If either Party becomes aware of any act or circumstance which would change or render incorrect, in whole or in part, any representation or warranty made by such Party, whether as of the Effective Date or any time thereafter through the Closing Date, such Party will give immediate written notice of such changed fact or circumstance to the other Party, but such notice shall not release the noticing Party of any liabilities or obligations with respect thereto. In the event a Party delivers such notice, the other Party shall have the right, upon written notice, to terminate this Agreement. For purposes of this Agreement, the knowledge requirement shall be based on actual written notice to each Party's designated person in a form which would provide actual notice to a person without a duty of inquiry. ULV's designated person is solely limited to _____, personally, and does not include his or any of ULV's agents, advisors or consultants. City's designated person is solely limited to _____, personally, and does not include his/her or any of City's agents, advisors or consultants. The Parties' respective designated persons shall incur no personal liability for any breach or alleged breach under this Agreement.

5.3 Brokerage Commissions. The Parties hereby each represent and acknowledge that neither Party has hired or otherwise engaged in an agreement with a broker or other party who is entitled to a commission or payment based on the transactions set forth herein. The Parties hereby indemnify and hold the other free and harmless from and against any and all costs and liabilities including, without limitation attorneys' fees, for causes of action or proceedings which may be instituted by a broker, agent or finder, licensed or otherwise, claiming through, under or by reason of the conduct of the indemnifying Party in connection with this Agreement. The foregoing representation and indemnity shall survive the termination of this Agreement.

6. DEFAULT. In the event either Party defaults under any of the terms and provisions of this Agreement (and such default continues for a period of ten (10) business days following receipt of written notice of such default from the non-breaching Party), the non-breaching Party shall have the right, but not the obligation, as its sole remedy for such default, to terminate this Agreement and the Escrow created hereby. In the event of such termination, the breaching Party shall deliver to the non-breaching Party all work product prepared by or on behalf of the breaching Party with respect to the Properties which the breaching Party would have received in the Exchange, but excluding internally prepared financial analyses, work product subject to proprietary rights of third parties and the attorney work product doctrine, and any documents protected by attorney client privilege, and without representation or warranty or right to rely thereon.

7. ADDITIONAL TERMS AND CONDITIONS

7.1 View Corridor. Within 36 months of the Effective Date (the "Application Period"), ULV shall submit to the City a proposed site plan design showing all proposed improvements on the View Corridor. The City Planning Department will then inform ULV, based on upon the site plan, on the necessary submittals. If ULV fails to submit a viable site plan within the Application Period, (i) ULV shall, upon written demand by the City, convey fee title to the View Corridor back to the City.

7.2 Option Property. Subject to timely submission of the Improvement Application to the City pursuant to Section 7.1, the City grants an option ("Option") to ULV to purchase the Option Property at any time within five (5) years of the Effective Date (the "Option Period"). ULV may exercise the Option, at its sole discretion, by sending written notice to the City during the Option Period. The purchase and sale of the Option Property shall be subject to the terms and conditions of a separate agreement (the "Option Property Sale"). The purchase price of the Option Property shall be [redacted] on the fair market value of the Option Property, as based on the appraisal commissioned by the City prior to the Effective Date.

7.3 Financing. The City agrees in principle to lend ULV up to Forty Million Dollars ($40,000,000) (the "Loan") to partially finance the ULV Expansion Project, pursuant to the terms and conditions of a separate loan agreement (the "Loan Agreement"), promissory note and security instrument (together with the Loan Agreement, the "Loan Documents"). The details of financing, including the source of the Loan, the terms (including estimated debt service, repayment term, and interest rate), and the scope and particulars of the collateral that ULV will be required to provide to the City to secure the Loan, shall all be negotiated and memorialized in the Loan Documents. Notwithstanding the subsequent negotiation of the separate Loan Agreement as identified in this paragraph, the City and ULV understand and agree that the consideration for this Agreement is based on the Loan Agreement including non-negotiable terms such as a five (5) year deferral of any payments owed during the first five (5) years of any required debt service payments, where any and all unpaid interest for each annual period deferred is added to the principal amount and the following period interest is calculated upon the accrued amount, as well as an interest rate that is 200 basis points above what the City realized in the previous 12 months in the portfolio, which consists of Securities and Local Agency Investment Funds (LAIF); referenced as "City Invested Funds" in the City Treasurer's Report.

7.4 ULV College of Health. Assuming the City conveys the FS1 Site to ULV pursuant to Section 1.2 herein, ULV shall submit to the City a Development Plan Discretionary Entitlement Application. Notwithstanding the reference to College of Health Parking in Recital E, the development plan for the College of Health shall be required to meet all Development Code standards, regulations and parking requirement for the MU-1 (Downtown Mixed Use) zoning district. A request in the reduction of required parking will require a parking demand analysis study to be prepared. A parking reduction, based upon low parking demand, may be allowed upon the approval of a Low Demand Parking Reduction Agreement by the applicable Approving Authority pursuant to Table 2.02-1 (Review Matrix) of the Ontario Development Code. It is mutually agreed that the City will use its good faith efforts to identify the necessary parking within the City's downtown area to help offset the potential reduction in parking. All applicable entitlement application and development impact fees (DIF), shall be paid at time of entitlement application submittal and at permit issuance (DIF) for the construction of the development.

7.5 ULV Parking Lot/Lot Split. The City at its sole cost, shall obtain a lot split for the property commonly known as 320 East "D" Street (APN: 1048-541-15) for the purpose of obtaining a single legal parcel referred to herein as the ULV Parking Lot which is identified in **Exhibit "A-1"** (hereinafter "Lot Split"). City will use reasonable efforts to ensure that ULV and the ULV College of Law vehicular and pedestrian access to the building and other portions of the ULV College of Law site.

7.6 Survival. All of the foregoing provisions in this Section 7 shall survive the Close of Escrow but not the termination of this Agreement.

8. MISCELLANEOUS.

8.1 Costs of Conveyance. All costs related to each Party's due diligence inspections and testing, and production of and/or reproduction of the Due Diligence Materials shall be the sole responsibility of the Party expending such costs.

8.2 Attorneys' Fees; Litigation. If any arbitration or action at law or in equity is necessary to enforce or interpret the terms of this Agreement, the prevailing party (including on appeal) shall be entitled to reasonable attorneys' fees, costs and necessary disbursements in addition to any other relief to which such Party may be entitled.

8.3 Notices. All notices required to be delivered under this Agreement to the other Party must be in writing and shall be effective (i) on the date of personally delivery by the other Party, by messenger or by courier; (ii) three (3) business days after deposit in the United States mail, registered or certified; (iii) twenty-four (24) hours after deposit before the daily deadline time with a reputable overnight courier or service; or (iv) upon receipt of an email, provided a hard copy of such transmission shall be thereafter delivered in one of the methods described in the foregoing (i) through (iii); in each case postage fully prepaid and addressed to the respective Parties as set forth below or to such other address and to such other persons as the Parties may hereafter designate by written notice to the other Party hereto:

To ULV: University of La Verne
Attn: _____
1950 3rd Street
La Verne, CA 91750
Attn: President, Dr. Devorah Lieberman
Avo Kechichian

To City: City of Ontario
Scott Ochoa, City Manager
303 East "B" Street
Ontario, CA 91764

With A Copy To: Best Best & Krieger LLP
2855 E. Guasti Road, Suite 400
Ontario, CA 91761
Attn: Ruben Duran, City Attorney

8.4 Authority. The person(s) executing this Agreement on behalf of the Parties hereto warrant that (i) such Party is duly organized and existing, (ii) they are duly authorized to execute and deliver this Agreement on behalf of said Party, (iii) by so executing this Agreement, such Party is formally bound to the provisions of this Agreement, and (iv) the entering into this Agreement does not violate any provision of any other agreement to which said Party is bound.

8.5 Execution in Counterparts. This Agreement may be executed in several counterparts, and all so executed shall constitute one agreement binding on all Parties hereto, notwithstanding that all Parties are not signatories to the original or the same counterpart.

8.6 Assignment. Neither Party hereto may assign its rights or delegate its obligations hereunder without the prior written consent of the other Party.

8.7 Third Party Beneficiaries. Nothing in this Agreement shall be construed to confer any rights upon any person or entity not signatory to this Agreement.

8.8 Binding on Heirs. This Agreement shall be binding upon the Parties hereto and their respective heirs, representatives, transferees, successors, and assigns.

8.9 Time of the Essence. Time is of the essence with respect to each of the terms, covenants, and conditions of this Agreement.

8.10 Condemnation and Casualty. In the event the Property are (i) taken, in whole or in part, or designated to be taken by condemnation proceedings other than condemnation proceedings instigated by the City, or proceedings in lieu thereof, or (ii) damaged as a result of any earthquake, hurricane, tornado, flood, sinkhole, landslide, fire, or other casualty, prior to the Close of Escrow, each Party shall have the right to terminate this Agreement and cancel Escrow by delivering to the other Party and Escrow Holder written notice thereof.

8.11 Entire Agreement, Waivers and Amendments. This Agreement and any written agreement entered into by the Parties with respect to the Property, incorporate all of the terms and conditions mentioned herein, or incidental hereto, and supersede all negotiations and previous agreements between the Parties with respect to all or part of the subject matter thereof. All waivers of the provisions of this Agreement must be in writing and signed by the appropriate authorities of the Party to be charged. Any amendment or modification to this Agreement must be in writing and executed by both Parties. The City Manager of the City, in consultation with the City Attorney, shall determine whether any such amendment or modification requires City Council approval. Amendments and modifications of this Agreement that only extend the time for the Parties to complete actions prior to the Closing Date or extend the Closing Date shall not require City Council approval.

8.12 Exhibits. All exhibits attached to this Agreement are incorporated herein by this reference and made a part hereof. Said Exhibits are identified as follows:

"A"	LEGAL DESCRIPTION OF ULV PROPERTY
"A-1"	LEGAL DESCRIPTION OF ULV PARKING LOT (LOT SPLIT)
"B-1"	LEGAL DESCRIPTION OF VIEW CORRIDOR
"B-2"	LEGAL DESCRIPTION OF FS1 SITE
"B-3"	LEGAL DESCRIPTION OF OPTION PROPERTY
"C-1"	VIEW CORRIDOR GRANT DEED
"C-2"	CERTIFICATE OF ACCEPTANCE – ULV PARKING LOT GRANT DEED
"C-3"	FS1 SITE GRANT DEED
"C-4"	ULV NON-FOREIGN AFFIDAVIT
"D"	ULV PARKING LOT GRANT DEED

8.13 Effect of Recitals. The Recitals above are deemed true and correct, are hereby incorporated into this Section as though fully set forth herein, and the Parties acknowledge and agree that they are each bound by same.

8.14 Section References. Any reference to any section of this Agreement cited without a decimal includes all sections following the cited section. For example, a reference to Section 5 includes Sections 5.1, 5.1(a), etc.

8.15 Severability. If any provision in this Agreement is held by a court of competent jurisdiction to be invalid, void, or unenforceable, the remaining provisions will nevertheless continue in full force without being impaired or invalidated in any way.

8.16 Interpretation: Governing Law; Venue. This Agreement shall be construed according to its fair meaning and as if prepared by both Parties hereto. This Agreement shall be construed in accordance with the laws of the State of California in effect on the Effective Date with venue in San Bernardino County, California.

8.17 Covenants to Survive Escrow. The covenants and agreements contained in this Agreement shall survive the Close of Escrow.

8.18 Conflicts of Interest. No director, officer, official, representative, agent or employee of either Party shall have any financial interest, direct or indirect, in this Agreement.

8.19 Nondiscrimination. There shall be no discrimination by the Parties against any person on account of race, color, religion, sex, marital status, national origin, ancestry, or any other protected class under the Constitution of the State of California or of the United States in the performance of their respective obligations under this Agreement.

8.20 Rights and Remedies are Cumulative. Except as may be otherwise expressly stated in this Agreement, the rights and remedies of the Parties are cumulative, and the exercise by any Party of one or more of its right or remedies shall not preclude the exercise by it, at the same time or at different times, of any other rights or remedies for the same default or any other default by another Party.

8.21 Provisions Required by Law Deemed Inserted. Each and every provision of law and clause required by law to be inserted in this Agreement shall be deemed to be inserted herein and the Agreement shall be read and enforced as though it were included herein, and if through mistake or otherwise, any such provision is not inserted, or is not correctly inserted, then upon application of either Party, the Agreement shall forthwith be physically amended to make such insertion or correction. The foregoing shall not be read in a manner which works to strike or modify a negotiated term of this Agreement.

8.22 Cooperation. The Parties acknowledge that it may be necessary to execute documents other than those specifically referred to herein in order to complete the Exchange and/or to accomplish the objectives and requirements that are set out in this Agreement. Both Parties hereby agree to cooperate with each other by executing such other documents or taking such other actions as may be reasonably necessary to complete this transaction in accordance with the intent of the Parties as evidenced in this Agreement and attached Exhibits hereto.

[***Signatures on Following Page***]

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed by their respective duly authorized officers, as of the Effective Date.

ULV: UNIVERSITY OF LA VERNE By:_____ Its:_____	**CITY:** CITY OF ONTARIO By: _____ Its: _____ ATTEST: _____ City Clerk
APPROVED AS TO FORM: [INSERT FIRM NAME] By:_____ [INSERT NAME AND TITLE]	APPROVED AS TO FORM: By:_____ City Attorney, BEST BEST & KRIEGER LLP

EXHIBIT "A"

LEGAL DESCRIPTION OF ULV PROPERTY

[To Be Inserted]

EXHIBIT “A-1”

LEGAL DESCRIPTION OF ULV PARKING LOT (LOT SPLIT)

MSL ENGINEERING, INC. RECOMMENDED LEGAL DESCRIPTION FOR THE
LA VERNE COLLEGE OF LAW PARKING LOT LOCATED ON THE EAST PORTION OF APN 1048-541-15

A PORTION OF PARCEL 1 OF PARCEL MAP NO. 15245 IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, AS PER MAP FILED JANUARY 14, 2000 AS INSTRUMENT NO. 20000014648 IN BOOK 188 OF PARCEL MAPS AT PAGES 93 THROUGH 95 INCLUSIVE IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY DESCRIBED AS FOLLOWS:

BEGINNING AT THE MOST NORTHERLY NORTHEAST CORNER OF SAID PARCEL 1 BEING A POINT ON THE SOUTHERLY RIGHT OF WAY LINE OF D STREET AS SHOWN ON SAID PARCEL MAP;
THENCE SOUTH 44°59’54” EAST ALONG THE NORTHEASTERLY LINE OF SAID PARCEL 1 A DISTANCE OF 31.11 FEET TO AN ANGLE POINT ON THE EASTERLY LINE OF SAID PARCEL 1, AND A POINT ON THE WESTERLY RIGHT OF WAY LINE OF SULTANA AVENUE AS SHOWN ON SAID PARCEL MAP;
THENCE SOUTH 00°00’00” EAST ALONG SAID EASTERLY LINE OF PARCEL 1 AND SAID WESTERLY RIGHT OF WAY LINE OF SULTANA AVENUE 341.22 FEET TO AN ANGLE POINT THEREON;
THENCE SOUTH 44°59’56” WEST ALONG THE SOUTHEAST LINE OF SAID PARCEL 1 A DISTANCE OF 39.60 FEET TO AN ANGLE POINT ON THE SOUTHERLY LINE OF SAID PARCEL 1, AND THE NORTHERLY RIGHT OF WAY LINE OF C STREET AS SHOWN ON SAID PARCEL MAP;
THENCE SOUTH 89°59’51” WEST ALONG SAID SOUTHERLY LINE OF PARCEL 1 AND SAID NORTHERLY RIGHT OF WAY LINE OF C STREET 224.01 FEET TO AN ANGLE POINT THEREON;
THENCE NORTH 00°01’34” EAST ALONG SAID SOUTHERLY LINE OF PARCEL 1 AND SAID NORTHERLY RIGHT OF WAY LINE OF C STREET 2.00 FEET TO AN ANGLE POINT THEREON;
THENCE SOUTH 89°59’51” WEST ALONG SAID SOUTHERLY LINE OF PARCEL 1 AND SAID NORTHERLY RIGHT OF WAY LINE OF C STREET 8.99 FEET TO A POINT ON A LINE PARALLEL WITH AND 261.00 FEET WESTERLY OF SAID EASTERLY LINE OF PARCEL 1 AND SAID WESTERLY RIGHT OF WAY LINE OF SULTANA AVENUE;
THENCE LEAVING SAID SOUTHERLY LINE OF PARCEL 1 AND SAID NORTHERLY RIGHT OF WAY LINE OF C STREET NORTH 00°00’00” EAST ALONG SAID PARALLEL LINE 389.25 FEET TO A POINT ON THE NORTHERLY LINE OF SAID PARCEL 1 AND SAID SOUTHERLY RIGHT OF WAY LINE OF D STREET;
THENCE SOUTH 89°59’47” EAST ALONG SAID NORTHELY LINE OF PARCEL 1 AND SAID SOUTHERLY RIGHT OF WAY LINE OF D STREET 239.00 FEET TO THE POINT OF BEGINNING OF THIS DESCRIPTION.

THE AREA OF THE ABOVE DESCRIBED LEGAL DESCRIPTION CONSISTS OF APPROXIMATELY 101,461 SQUARE FEET OR 2.329 ACRES.

THIS LEGAL DESCRIPTION WAS PREPARED BY OR UNDER THE DIRECT SUPERVISION OF THE FOLLOWING STATE OF CALIFORNIA PROFESSIONAL LAND SURVEYOR:

Mark S. Lamoureux 11-19-2021
MSL ENGINEERING, INC. DATE
MARK S. LAMOUREUX, PRESIDENT, PE, PLS
P.L.S. 5794 REGISTRATION EXPIRES 06-30-2022
MSL JN 21022B

EXHIBIT “B-1”

LEGAL DESCRIPTION OF VIEW CORRIDOR

[To Be Inserted]

EXHIBIT "B-2"

LEGAL DESCRIPTION OF FS1 SITE

[To Be Inserted]

EXHIBIT "B-3"

LEGAL DESCRIPTION OF OPTION PROPERTY

[To Be Inserted]

EXHIBIT "C-1"

UNIVERSITY OF LA VERNE

(Space Above For Recorder's Use)

The undersigned grantor(s) declare(s): This conveyance is exempt from the payment of a documentary transfer tax pursuant to Revenue and Taxation Code Section 11922.	This document is being recorded for the benefit of the University of La Verne and is exempt from the payment of a recordation fee pursuant to Govt. Code Section 6103.

GRANT DEED

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged, the CITY OF ONTARIO, a California municipal corporation, hereby grants to the UNIVERSITY OF LA VERNE, a California corporation duly organized and validly existing under the Constitution and the laws of the State of California, that certain real property located in the City of Ontario, County of San Bernardino, State of California, described in the legal description and depicted in the map attached hereto as Exhibit "A," and incorporated herein by this reference.

Dated: _____ _____

By:_____
Its:_____

EXHIBIT "C-2"

CERTIFICATE OF ACCEPTANCE
(Government Code Section 27281)

This is to certify that the interest in real property conveyed by the Grant Deed dated _____, from the UNIVERSITY OF LA VERNE, a California corporation duly organized and validly existing under the Constitution and the laws of the State of California, to the CITY OF ONTARIO, a California municipal corporation, is hereby accepted by the undersigned officer on behalf of the CITY OF ONTARIO pursuant to authority conferred by the California Constitution and City Council action dated _____, 202_, and the grantee consents to recordation thereof by its duly authorized officer.

Dated: _____ **CITY OF ONTARIO**

_____

ATTEST:

_____
City Clerk

EXHIBIT "C-3"

FS1 GRANT DEED

EXHIBIT "C-4"

NON-FOREIGN AFFIDAVIT

Section 1445 of the Internal Revenue Code provides that the transferee of an interest in real property located in the United States must withhold tax if the transferor is a foreign person. To inform the CITY OF ONTARIO, a California municipal corporation, ("Transferee"), that withholding of tax is not required upon the sale by the University of La Verne ("Transferor"), of its fee simple interest in that certain real property sold pursuant to the Real Property Exchange Agreement and Joint Escrow Instructions dated _____, 202__ ("Agreement"), which real property is described in the legal description attached to the Agreement as Exhibit "A," and incorporated herein by this reference, the undersigned hereby certifies the following:

1. The Transferor is not a foreign corporation, foreign partnership, foreign trust, or foreign estate (as those terms are defined in the Internal Revenue Code and the income tax regulations promulgated thereunder);

2. The Transferor's United States Taxpayer Identification Number is _____;

3. The Transferor's office address is ***[address]***; and

4. The Internal Revenue Service has not issued any notice with respect to Transferor or listed Transferor as a person whose affidavit may not be relied upon for purposes of Section 1445 of the Internal Revenue Code.

The Transferor understands that this certification may be disclosed to the Internal Revenue Service by Transferee and that any false statement contained herein could be punished by fine, imprisonment or both.

Under penalty of perjury, I declare that I have examined this certification and to the best of my knowledge and belief it is true, correct and complete, and I further declare that I am the _____ of the Transferor, and that I have authority to sign this document on behalf of the Transferor.

Dated: _____ _____

By:_____
Its:_____

EXHIBIT "D"

CITY OF ONTARIO

(Space Above For Recorder's Use)

GRANT DEED

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged, the UNIVERSITY OF LA VERNE, a California corporation duly organized and validly existing under the Constitution and the laws of the State of California, hereby grants to the CITY OF ONTARIO, a California municipal corporation, that certain real property located in the City of Ontario, County of San Bernardino, State of California, described in the legal description and depicted in the map attached hereto as Exhibit "A," and incorporated herein by this reference.

Dated: _____ _____

By:_____
Its:_____

CITY OF ONTARIO *Agenda Report* **April 19, 2022**	**SECTION:** **CONSENT CALENDAR**
Department: Economic Development Prepared By: Charity Hernandez Staff Member Presenting: Jennifer McLain Hiramoto, Economic Development Director Approved By:	Submitted To: Council/OHA Approved: _____ Continued To: _____ Denied: _____ Item No: 14

SUBJECT: **AN AMENDMENT TO PROFESSIONAL SERVICES AGREEMENTS FOR ON-CALL APPRAISAL, PROJECT MANAGEMENT, LAND ACQUISITION, RELOCATION AND PROPERTY MANAGEMENT SERVICES**

RECOMMENDATION: That the City Council ("City") approve and authorize the City Manager or his designee to execute Amendment No. 3 to Professional Services Agreements with R.P. Laurain & Associates in the amount of $100,000; Integra Realty Resources in the amount of $100,000; Property Specialist Inc., (dba CPSI) in the amount of $200,000; and, Amendment No. 6 to Professional Services Agreements with Transtech Engineers Inc. in the amount of $100,000.

THE FOLLOWING COUNCIL GOALS ARE BEING ACHIEVED:
Operate in a Businesslike Manner
Focus Resources in Ontario's Commercial and Residential Neighborhoods

FISCAL IMPACT: The Fiscal Year 2021-22 Adopted Budget includes, and any subsequent Adopted Budget shall include, appropriations from General Fund for these services. This proposed amendment will increase all of these on-call services for a total of $500,000. The R.P. Laurain & Associates Agreement not-to-exceed amount will increase from $220,000 to $320,000; Integra Realty Resources Agreement not-to-exceed will increase from $89,900 to $189,900; the Property Specialist Inc., (dba CPSI) Agreement not-to-exceed will increase from $995,813 to $1,195,813; and the Transtech Engineers Inc. Agreement not-to-exceed will increase from $1,478,365 to $1,578,365. The consultants/firms have agreed to the proposed fixed billing rates and will be compensated for the scope of work at the approved billing rates, as set forth in the subject agreements.

BACKGROUND & ANALYSIS: On August 19, 2019, after an extensive solicitation and procurement selection process, the City entered into on-call Professional Services Agreements with R.P. Laurain & Associates and Integra Realty Resources for appraisal services, and CPSI for land acquisition, relocation and property management services. The selections were based on the firms' experience, knowledge and qualifications.

For project management services, the City entered into an on-call Professional Services Agreement with Transtech Engineers Inc. on October 1, 2019. The selection was after an extensive solicitation

and procurement selection process and was based on Transtech's experience, knowledge and qualifications. The Professional Services Agreements detailed above are currently in the third year of a three year term, with each of the Agreements allowing for options to extend for two additional years.

The City continues working on high-profile economic development and redevelopment projects that require the need for land valuation estimates, appraisal reports, property acquisition and relocation activities, and project management assistance. These projects include, but are not limited to, areas on or near Holt Boulevard, Downtown Ontario and east of the the Ontario International Airport.

There is a current need to amend these on-call Professional Services Agreements to increase the not-to-exceed amounts and continue to use these firms to advance ongoing projects with the overall goal of reducing blight, increasing property values and enhancing amenities available to those that travel, live and work in Ontario.

CITY OF ONTARIO *Agenda Report* **April 19, 2022**	**SECTION:** **CONSENT CALENDAR**
Department: Economic Development Prepared By: Charity Hernandez Staff Member Presenting: Jennifer McLain Hiramoto, Economic Development Director Approved By:	Submitted To: Council/OHA Approved: _____ Continued To: _____ Denied: _____ Item No: 15

SUBJECT: FIRST AMENDMENT TO A PROFESSIONAL SERVICES AGREEMENT FOR ARCHITECTURAL AND DESIGN SERVICES

RECOMMENDATION: That the City Council ("City") approve and authorize the City Manager to execute a First Amendment to a Professional Services Agreements with Thirtieth Street Architects in the amount not to exceed $200,000.

THE FOLLOWING COUNCIL GOALS ARE BEING ACHIEVED:
Invest in the Growth and Evolution of the City's Economy
Operate in a Businesslike Manner
Invest in the Growth and Evolution of the City's Economy

FISCAL IMPACT: The Fiscal Year 2021-22 Adopted Budget includes, and any subsequent Adopted Budget shall include, appropriations from the General Liability Fund for these services. This proposed agreement is not-to-exceed $200,000.

BACKGROUND & ANALYSIS: In November of 2021, the building located at 122 South Vine Avenue suffered fire damage due to an undetermined source. Prior to the fire, City staff had undertaken a work program that included the adaptive reuse of the property as part of the Transformative Climate Community Grant. The proposed project was called the Downtown Ontario Mobility Hub, which was slated to convert the property into a Transit Hub serving Emporia Place and adding connectivity to the existing Omnitrans fixed route service as well as West Valley Connector. Proposed amenities included bike lockers, a bike repair station, shared education center, and a training and class area with landscaping comprising of California friendly, drought-tolerant plant material.

Given the fire damage, the proposed project needs to be reviewed. The First Amendment to the Professional Services Agreement with Thirtieth Street Architects, Inc. will include architectural, engineering, and landscape design services for the future construction of a new Downtown Ontario Mobility Hub.

CITY OF ONTARIO *Agenda Report* **April 19, 2022**	**SECTION:** **CONSENT CALENDAR**
Department: Police Department Prepared By: Lizceth Zazueta Department: Prepared By: Lizceth Zazueta Staff Member Presenting: Mike Lorenz, Chief of Police Approved By:	Submitted To: Council/OHA Approved: _____ Continued To: _____ Denied: _____ Item No: 16

SUBJECT: **CONSIDERATION OF A PROPOSED MILITARY EQUIPMENT USE POLICY TO COMMENCE THE APPROVAL PROCESS OF THE POLICY PURSUANT TO GOVERNMENT CODE &SECT; 7070 ET. SEQ**

RECOMMENDATION: That the City Council receive the proposed military equipment use policy and commence the approval process for the City of Ontario to adopt the policy in accordance with Government Code § 7070 et. seq.

THE FOLLOWING COUNCIL GOALS ARE BEING ACHIEVED:
Operate in a Businesslike Manner
Maintain the Current High Level of Public Safety
Pursue City's Goals and Objectives by Working with Other Governmental Agencies

FISCAL IMPACT: There is no direct fiscal impact associated with this action.

BACKGROUND & ANALYSIS: Assembly Bill No. 481 ("AB 481") was approved by Governor Newsom on September 30, 2021 to increase transparency, accountability, and oversight surrounding the use and acquisition of military equipment by state and local enforcement. AB 481 added Chapter 12.8, commencing with Section 7070, to the Government Code. Pursuant to Government Code section 7070 et. seq., the Ontario City Council must approve a publicly released, written military equipment use policy ("Policy"). The Policy must include the type, quantity, capabilities, purposes, and authorized uses of each type of military equipment owned by the law enforcement agency. Additionally, the Policy must include the acquisition and maintenance costs of the equipment, as well as the training required by any officer allowed to use the military equipment. The Policy must also include mechanisms to enforce the Policy and procedures for members of the public to register complaints or concerns about the use of military equipment.
City Council must adopt the Policy by ordinance after a public hearing at a regular meeting held pursuant to the Brown Act. Before City Council adopts the Policy, the Policy must be posted on the Ontario Police Department website at least thirty (30) days before the public hearing. In compliance with Government Code section 7071(a)(2), the Ontario Police Department made the Policy available on the City's website at https://www.ontarioca.gov/Police on April 15th, 2022, and is providing the

proposed Policy to City Council as an attachment to this staff report, thereby commencing the approval process of the proposed Policy.

Military Equipment

708.1 PURPOSE AND SCOPE

The purpose of this policy ("Policy") is to provide guidelines for the approval, acquisition, and reporting requirements of military equipment pursuant to Assembly Bill 481 ("AB 481") (California Government Code section 7070, et seq.).

708.1.1 DEFINITIONS

Definitions related to this Policy include those provided in Government Code section 7070, and as follows:

Governing body – The City of Ontario City Council ("City Council").

Military equipment – Includes but is not limited to the following:

- Unmanned, remotely piloted, powered aerial or ground vehicles.
- Mine-resistant ambush-protected ("MRAP") vehicles or armored personnel carriers.
- High mobility multipurpose wheeled vehicles ("HMMWV)", two-and-one-half-ton trucks, five-ton trucks, or wheeled vehicles that have a breaching or entry apparatus attached.
- Tracked armored vehicles that provide ballistic protection to their occupants.
- Command and control vehicles that are either built or modified to facilitate the operational control and direction of public safety units.
- Weaponized aircraft, vessels, or vehicles of any kind.
- Battering rams, slugs, and breaching apparatuses that are explosive in nature. This does not include a handheld, one-person ram.
- Firearms and ammunition of.50 caliber or greater, excluding standard-issue shotguns and standard-issue shotgun ammunition.
- Specialized firearms and ammunition of less than.50 caliber, including firearms and accessories identified as assault weapons in Penal Code section 30510 and Penal Code section 30515, with the exception of standard-issue firearms.
- Any firearm or firearm accessory that is designed to launch explosive projectiles.
- Noise-flash diversionary devices and explosive breaching tools.
- Munitions containing tear gas or OC, excluding standard, service-issued handheld pepper spray.
- TASER® Shockwave, microwave weapons, water cannons, and long-range acoustic devices ("LRADs").
- Kinetic energy weapons and munitions.
- Any other equipment as determined by the City Council to require additional oversight.

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708.2 POLICY

It is the Policy of the City of Ontario Police Department ("Department") that members of this Department comply with the provisions of Government Code section 7070 et seq. with respect to the funding, acquisition, and use of military equipment.

708.3 MILITARY EQUIPMENT COORDINATOR

The Chief of Police will designate a member of this Department to act as the military equipment coordinator. The responsibilities of the military equipment coordinator include but are not limited to:

(a) Acting as liaison to the City Council for matters related to the requirements of this Policy.

(b) Identifying Department equipment that qualifies as military equipment in the current possession of the Department, or equipment the Department intends to acquire, that requires approval by the City Council.

(c) Conducting an inventory of all military equipment annually.

(d) Collaborating with any allied agency that may use military equipment within the jurisdiction of the Department.

(e) Preparing for, scheduling, and coordinating the annual community engagement meeting to include:

1. Publicizing the details of the meeting; and
2. Preparing for public questions regarding the Department's funding, acquisition, and use of equipment.

(f) Preparing the annual military equipment report for submission to the Chief of Police and ensuring that the report is made available on the Ontario Police Department website (Government Code § 7072).

(g) Establishing the procedure for a person to register a complaint or concern, or how that person may submit a question about the use of a type of military equipment, and how the Department will respond in a timely manner.

708.4 MILITARY EQUIPMENT INVENTORY

The list of qualifying military equipment for the Department is attached to this Policy.

708.5 APPROVAL

The Chief of Police or the authorized designee shall obtain approval from the City Council by way of an ordinance adopting the Policy. As part of the approval process, the Chief of Police or the authorized designee shall ensure the proposed Policy is submitted to the City Council and is available on the Department website at least thirty (30) days prior to any public hearing concerning the military equipment at issue. The Policy must be approved by the governing body prior to engaging in any of the following:

a) Requesting military equipment made available pursuant to 10 USC § 2576(a).

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b) Seeking funds for military equipment, including but not limited to applying for a grant, soliciting or accepting private, local, state, or federal funds, in-kind donations, or other donations or transfers.

c) Acquiring military equipment either permanently or temporarily, including by borrowing or leasing.

d) Collaborating with another law enforcement agency in the deployment or other use of military equipment within the jurisdiction of this Department.

e) Using any new or existing military equipment for a purpose, in a manner, or by a person not previously approved by the City Council.

f) Soliciting or responding to a proposal for, or entering into an agreement with, any other person or entity to seek funds for, apply to receive, acquire, use, or collaborate in the use of military equipment.

g) Acquiring military equipment through any means not provided above.

708.6 COORDINATION WITH OTHER JURISDICTIONS

Military equipment used by any member of this Department shall be approved for the use and in accordance with this Department Policy. Military equipment used by other jurisdictions that are providing mutual aid to the City of Ontario, or otherwise engaged in law enforcement operations in this City, shall comply with their respective military equipment use policies in rendering mutual aid or carrying out a law enforcement function related to a criminal matter under their investigation.

Situations may arise where the Department may deploy or use military equipment, as defined, owned by other law enforcement agencies. The Department hereby adopts the Military Equipmentpolicy, which may be amended from time to time, under Government Code section 7070 et seq., for jurisdictions that the Department may engage with to provide mutual aid. This section is in no way a limitation to the ability of the Department to deploy or use the military equipment of another jurisdiction.

708.7 COMPLIANCE

Department members are bound to adhere to this Policy, in addition to state and local laws and ordinances when employing the use of military equipment at any time. Violations of the law or this Policy may result in criminal or administrative investigations, or action.

708.8 COMPLAINT PROCESS

Members of the public may register complaints or concerns or submit questions about the use of each specific type of military equipment in this Policy by any of the following means:

1. Via email to: MilitaryEquipmentCoordinator@ontariopolice.org

2. Via phone call to: (909) 395-2001

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3. Via mail sent to: Ontario Police Department

Attn: Military Equipment Use Coordinator

2500 S. Archibald Avenue

Ontario, CA 91761

The Department is committed to responding to complaints, concerns and/or questions received through any of the above methods in a timely manner.

708.9 ANNUAL REPORT

Upon approval of this Policy, the Chief of Police or the authorized designee will submit a military equipment report to the City Council for each type of military equipment approved within one year of approval of the Policy, and annually thereafter for as long as the military equipment is available for use.

The Chief of Police or the authorized designee should also make each annual military equipment report publicly available on the Department website for as long as the military equipment is available for use. The report shall include all information required by Government Code section 7072 for the preceding calendar year for each type of military equipment in the Department's inventory.

708.10 COMMUNITY ENGAGEMENT

Within thirty (30) days of submitting and publicly releasing the annual report, the Department shall hold at least one well-publicized and conveniently located community engagement meeting, at which the Department should discuss the report and respond to public questions regarding the funding, acquisition, or use of military equipment.

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Ontario Police Department Military Equipment Inventory

I. PURPOSE

This Department procedure establishes guidelines for the use, training, approval, and procurement of existing military equipment and future military equipment acquisitions in accordance with California Assembly Bill 481 (AB 481), codified in California Government Code sections 7070-7075. Additionally, this procedure outlines the fiscal impact and specific descriptions of existing military equipment within the Department's inventory.

II. SCOPE

This procedure applies to all members of the Department.

III. DEFINITIONS

Pursuant to AB 481, the following definitions are applicable **only** to the Department's current military equipment inventory and potential future military equipment acquisitions for operational needs. (For a more detailed list refer to Government Code Section 7070, for "military equipment" as defined within the assembly bill.)

A. "Governing body" means the City Council and Mayor.

B. "Military equipment" means the following:

1. Unmanned, remotely piloted, powered aerial or ground vehicles.
2. Armored personnel carriers and/or armored vehicles with breaching apparatus.
3. High mobility multipurpose wheeled vehicles (HMMWV), commonly referred to as Humvees, two and one-half-ton trucks.
4. Tracked armored vehicles that provide ballistic protection to their occupants and utilize a tracked system instead of wheels for forward motion.
5. Command and control vehicles that are either built or modified to facilitate the operational control and direction of public safety units.
6. Weaponized aircraft, vessels, or vehicles of any kind.
7. Battering rams, slugs, and breaching apparatuses that are explosive in nature.
8. Firearms of .50 caliber or greater. However, standard issue shotguns are specifically excluded from this definition.
9. Ammunition of .50 caliber or greater. However, standard issue shotgun ammunition is specifically excluded from this definition.
10. Specialized firearms and ammunition of less than .50 caliber, including assault weapons as defined in Sections 30510 and 30515 of the Penal Code, with the exception of standard issue service weapons and ammunition of less than .50 caliber that are issued to sworn members.
11. Any firearm or firearm accessory that is designed to launch explosive projectiles.

12. ‘Flashbang’ grenades and explosive breaching tools, ‘tear gas’ and ‘pepperballs’ excluding standard, service-issued handheld pepper spray.

13. Taser Shockwave, microwave weapons, water cannons, and the Long-Range Acoustic Device (LRAD).
14. The following projectile launch platforms and their associated munitions: 40mm projectile launchers, and specialty impact munition (SIM) weapons.

C. “Military equipment use policy” refers to this Department Procedure and means a publicly released, written document governing the use of military equipment by the Department that addresses, at a minimum, all of the following:

1. A description of each type of military equipment, the quantity sought, its capabilities, expected lifespan, and product descriptions from the manufacturer of the military equipment.
2. The purposes and authorized uses for which the Department proposes to use each type of military equipment.
3. The fiscal impact of each type of military equipment, including the initial costs of obtaining the equipment and estimated annual costs of maintaining the equipment.
4. The legal and procedural rules that govern each authorized use.
5. The training, including any course required by the Commission on Peace Officer Standards and Training, that must be completed before any sworn member is allowed to use each specific type of military equipment to ensure the full protection of the public’s welfare, safety, civil rights, and civil liberties and full adherence to the military equipment use policy.
6. The mechanisms to ensure compliance with the military equipment use policy, including which independent persons or entities have oversight authority, and, if applicable, what legally enforceable sanctions are put in place for violations of the policy.
7. The procedures by which members of the public may register complaints or concerns or submit questions about the use of each specific type of military equipment, and how the Department will ensure that each complaint, concern, or question receives a response in a timely manner.

D. “Law enforcement agency” means any of the following:

1. A police department, including the police department of a transit agency, school district, or any campus of the University of California, the California State University, or California Community Colleges.
2. A sheriff’s department.
3. A district attorney’s office.
4. A county probation department.

IV. MILITARY EQUPIMENT TYPES AND USAGE GUIDELINES

The Police Department recognizes that critical incidents are unpredictable and can be very dynamic in nature. A variety of military equipment options can greatly assist incident commanders, officers, and specific units in bringing those incidents to a swift resolution in a safe manner. The use of military equipment is restricted for use only in certain instances and in some cases only by certain units. While this procedure is wide-ranging, it is not all inclusive. There may be instances wherein unpredictable critical incidents demand the need for incident commanders to authorize military equipment to be used in a manner not outlined within this procedure. In scrutinizing those particular instances, the judgment of the incident commander influenced by the totality of the circumstances, public safety, officer safety, civil rights, and information available at the time will be used.

It is incumbent upon incident commanders, supervisors, individual officers, and specific units to recognize the particular circumstances wherein military equipment should be employed to enhance the safety of the public and officers, and to bring a critical incident to a safe resolution.

The following are the various types, descriptions, and guidelines for usage of military equipment currently employed by the Police Department.

A. Unmanned remotely piloted, powered aerial or ground vehicles

1. **Small Unmanned Aircraft Systems (sUAS):** An unmanned aircraft of any type that is capable of sustaining directed flight, whether pre-programmed or remotely controlled, and all of the supporting or attached systems designed for gathering information through imaging, recording or by any other means.

   Capability: sUAS can support first responders in any hazardous incident which would benefit from an aerial perspective. These uses could include search and rescue, barricaded suspects or high-risk tactical operations, disaster response, and video and photographic documentation of crime scenes.

   Usage: sUAS are to be used by trained pilots during high-risk operations, tactical operations, disaster response, and video and photographic documentation. These pilots receive regular training and flight hours and when applicable adhere to FAA regulations.

   Training Requirements: Drone operators attended continual yearly training.

   Fiscal Impact: See Appendix A

   Lifespan: Approximately five (5) years.

   The Department currently possesses the following types of sUAS:

a. **Parrot Anafi Thermal** (Quantity: 2)
Manufacturer: Parrot
Description: To balance the resolutions of the thermal image and visible image, and therefore benefit from information not visible in thermal, the displayed image is a fusion of the information from the two cameras.

b. **LOKI 1** (Quantity: 6)
Manufacturer: Sky-Hero
Description: A handheld drone designed for interior searches. The drone is controlled by a handheld remote control.

c. **Evo II** (Quantity: 1)
Manufacturer: Autel Robotics
Description: A handheld drone designed for exterior searches. The drone is controlled by a handheld remote control. It has the ability to record video for use with evidence collection.

2. **Small Unmanned Tracked Robots:** An unmanned tracked robot of any type that is capable of being remotely controlled as well as all of the supporting or attached systems designed for gathering information through imaging, recording or by any other means.

Capability: Small Unmanned Tracked Robots can support first responders in any hazardous incident which would benefit from a ground level perspective. These uses could include barricaded suspects or high-risk tactical operations, disaster response, and use in crawl spaces or confined isolated areas to assist in searches for suspects or evidence.

Usage: Small Unmanned Tracked Robots are to be used exclusively by the SWAT unit during high-risk operations, disaster response, and in crawl spaces or confined isolated areas to assist in searches for suspects or evidence.

Training Requirements: SWAT Officers regularly train on safe robot deployment in a variety of operational settings.

Fiscal Impact: See Appendix A

Lifespan: Dragon Runner – Lifespan varies with operational usage and wear.

The Department currently possesses the following types of Small Unmanned Tracked Robot:

a. **Dragon Runner** (Quantity: 1)
Manufacturer: QinetiQm

Description: Lightweight, expandable, and one-man portable robot that offers protection and support to officers. Designed to provide situational awareness by 'scouting out' while the officers remain at a safe distance.

Designed for rapid tactical missions, the robot is simple to operate and quick to deploy for searching rooms, hallways, stairwells, and confined spaces. With rubber tracks, the Dragon Runner effortlessly climbs stairs. It also includes an extendible rotating claw arm that simplifies opening door handles.

B. Armored Personnel Carriers

1. **BearCat:** An armored rescue vehicle capable of providing high ballistic protection, cover, limited breaching capability, and transport of officers and/or civilians at critical incidents and high-risk tactical operations.

   Capability: BearCats can support first responders in any hazardous, high risk, or critical incident which would benefit from having a vehicle that provides a high level of ballistic protection.

   Usage: These uses could include active shooters, armed barricaded suspects, hostage situations, high-risk tactical operations, disaster response, officer/citizen rescues, and CBRNE (Chemical, Biological, Radiological, Nuclear, and Explosive) attacks and detection.

   Training Requirements: Officers authorized to operate the BearCat are required to successfully complete in house training on its capabilities and must complete a driving assessment during the training period.

   Fiscal Impact: See Appendix A

   Lifespan: Approximately 20 years depending on operational usage and wear.

   The Department currently possesses the following types of BearCats:

   a. **BearCat G2** – 2 Door Model (Quantity: 1)
   Manufacturer: Lenco
   Description: The Lenco BearCat G2 is the standard armored rescue vehicle for special operations units within the US Law Enforcement community. The G2 has excellent on-road driving characteristics and maneuverability in tight urban settings. The large floor plan seats 10–12 fully equipped officers or citizens.

   b. **BearCat G3** – 4 Door Model (Quantity: 1)
   Manufacturer: Lenco
   Description: The BearCat G3 provides Lenco's proven armor system in a ruggedized off-road platform. The G3 utilizes the same body design, interior

features, and tactical options as the G2, but it comes standard with a heavier duty upgraded suspension and off-road tires, rims & run flats to provide enhanced off-road performance. The increased ground clearance and robust suspension allows for emergency response in rural regions and natural disaster scenarios where standard armored rescue vehicles would experience challenges.

c. **BearCat G3 w/ P3E MARS Ramp System** – 3 Door Model (Quantity: 1)
Manufacturer: Lenco
Description: The BearCat G3 provides Lenco's proven armor system in a ruggedized off-road platform. The G3 utilizes the same body design, interior features, and tactical options as the G2, but it comes standard with a heavier duty upgraded suspension and off-road tires, rims & run flats to provide enhanced off-road performance. The increased ground clearance and robust suspension allows for emergency response in rural regions and natural disaster scenarios where standard armored rescue vehicles would experience challenges. This armored rescue vehicle is outfitted with the P3E MARS ramp system which allows officers to safely make entry into or rescue citizens from elevated structures.

d. **Rook** – (Quantity: 1)
Manufacturer: Ring Power
Description: The Rook is a tracked armored vehicle capable of deploying officers into a critical incident or rescue citizens during a critical incident. It features several attachments capable of moving objects, or vehicles to aide in the peace resolution of a critical incident. The attachments and vehicle also can be used in various natural disaster incidents.

C. Command and Control Vehicles

1. **Mobile Command Vehicles:** Completely self-contained command posts designed to provide the Incident Commander with a mobile base of operation.

   Capability: As a mobile base of operation, these vehicles contain specialized command, control, and communications equipment to assist with this mission.

   Usage: Mobile Command Vehicles are to be utilized as an Incident Command Post for planned or unplanned events. Vehicles are also equipped with specialized equipment to assist with numerous types of incidents.

   Training Requirements: Officers are frequently train in the operations of Command vehicles.

   Fiscal Impact: See Appendix A

Lifespan: No lifespan indicated by manufacturer. Dependent on operational usage and wear.

The Department currently possesses the following types of Mobile Command Vehicles:

a. **SWAT Special Equipment Vehicle** – (Quantity: 1)

The SWAT Special Equipment Vehicle is a non-armored vehicle used by SWAT personnel to transport special weapons and equipment to the scene of critical incidents. Once at an incident, it is also used as a SWAT and Tactical Operations Center (TOC).

Manufacturer: Custom Built International Chassis
Description: This vehicle is a custom build. It is capable of transporting various SWAT equipment to a critical incident. It is also outfitted with various radio and computers to aid the Incident Commander.

b. **CP131 – Command Post Vehicle** - (Quantity: 1)
Manufacturer: Custom Built Freightliner Chassis
Description: This vehicle is a custom-built truck which allows officers to aide in communicating with subjects during critical incidents or can be utilized as a command post during any type of situation.

D. Explosive Breaching Equipment

1. **Explosive Breaching Equipment:** During crisis situations, it may become necessary for a SWAT team to facilitate an entry into a target location. It is critical the point of entry is breached quickly and as safely as possible. A quick and effective breach is one key to a successful tactical mission**.** In some instances, an explosive breach may be required to provide an added degree of safety and tactical advantage in order to accomplish a mission.

A variety of specialized breaching equipment consisting of explosive materials are possessed by the Department. Explosive Breaching Equipment can only be used exclusively by the SWAT team's dedicated breaching personnel.

Capability / Usage: Explosive breaching, the use of explosive materials to affect a breach, can be an effective option in SWAT team tactics. An effective breach is a design where the least amount of explosive material is used and still accomplishes its goal. An effective Explosive Breach can defeat fortified doors and walls. Effective breaching techniques allow tactical officers immediate entry with minimal risk to victims, officers, and suspects. An Explosive Breach should only be utilized after taking into consideration the overall mission, officer and citizen safety, the overall construction of the structure, the presence of unstable chemicals, explosives, or incendiary materials, and whether other means of

mechanical breaching would be effective and safe to use. The option to use an explosive breach shall be at the discretion of the SWAT Commander.

Training Requirements: Only SWAT Officers that are certified Explosive Breachers are authorized to utilize explosive breaches. SWAT Explosive Breachers must successfully complete a certified Explosive Breaching Course. Additionally, SWAT Explosive Breachers must maintain proficiency with the use and handling of explosives and explosive breaching techniques.

Fiscal Impact: See Appendix A

Lifespan: Approximately five (5) years.

The Department currently possesses the following types of Explosive Breaching Equipment:

a. **Explosive Breaching Equipment Kit** – (Quantity: Various)
Explosive Breaching Equipment consists of:
1. 50 grain Detonation Cord
2. 20 grain Boosters
3. C2 sheets
4. Shock-tube Blasting Cap
Manufacturer: Southwest Explosives
Description: Explosive breaching, the use of explosive materials to affect a breach, can be an effective option in SWAT team tactics. An effective breach is a design where the least amount of explosive material is used and still accomplishes its goal.

2. **Breaching Shotguns and Breaching Ammunition:** During crisis situations, it may become necessary for a SWAT team to facilitate an entry into a target location. It is critical the point of entry is breached quickly and as safely as possible. A quick and effective breach is one key to a successful tactical mission**.** In some instances, a breach initiated by a breaching shotgun loaded with specialized breaching rounds may be required to provide an added degree of safety and tactical advantage in order to accomplish a mission.

Specialized Breaching Rounds, also referred to as TKO round, are frangible and are designed to break into a powder form upon impact with a solid object (i.e., dead bolt lock, door frame, etc.)

The Department possesses a limited inventory of Breaching Shotguns and Breaching Shotgun Ammunition. Breaching Shotguns are to be used exclusively by trained members of the SWAT team.

Capability / Usage: Shotgun breaching, the use of a breaching shotgun to affect a breach, can be an effective option in SWAT team tactics. An effective breach is a

design where the least amount of breaching shotgun rounds is used and still accomplishes its goal. An effective shotgun breach can defeat fortified doors and locks. Effective breaching techniques allow tactical officers immediate entry with minimal risk to victims, officers, and suspects.

Training Requirements: SWAT team members regularly train on the use of shotgun breaching.
Fiscal Impact: See Annual Military Report

Lifespan: Remington 870 Police Magnum – Limited lifetime warranty. Lifespan varies on operational usage and wear

Breaching Shotgun Ammunition – Five (5) year limited warranty. Five (5) year shelf life.

The Department currently possesses the following types of breaching shotguns and breaching shotgun ammunition:

a. **Remington 870 Police Magnum –** (Quantity: 5)
Manufacturer: Remington
Description: The Remington 870 Police Magnum pump-action shotgun is a rugged 12-gauge with a short barrel backed by a stout 3" chamber. The all-matte black gun is parkerized for generalized durability and rust-resistance. Both the pump action for-end and stock are robust and tough synthetic.

b. **TKO 12-Gauge Breaching Shotgun Rounds** – (Quantity: 60)
Manufacturer: Defense Technology
Description: The 12-Gauge TKO Breaching Round is a 12-Gauge shell loaded with a compressed zinc slug, utilizing smokeless powder as a propellant. This is a widely used method to breach door locks or hinges for entry during tactical operations. When properly deployed, the TKO is capable of defeating door lock mechanisms, doorknobs, hinges, dead bolts, safety chains, and pad locks on both wooden or hollow core doors. Upon impact with the target, the zinc slug disintegrates into a fine powder eliminating fragmentation.

E. Firearms of .50 Caliber or greater

1. **.50 Caliber Rifles:** A heavy-duty, bolt-action rifle rated for .50 caliber ammunition that is capable for delivering precision rifle fire at great distances with effective results.

Due to the ever-increasing number of deadly incidents involving vehicle borne attacks and fortified structures both in Southern California and around the country, the SWAT Sniper Team currently employs the use of a .50 caliber rifle to address the unique operational needs presented by these threats.

The requirement and implementation of a .50 caliber rifle are now the standard for many SWAT Teams both in the US and abroad to combat vehicular threats that may arise out of conventional SWAT operations or domestic and international terror attacks.

Capability / Usage: These weapons provide the capability to pierce hard armor, multiple layers of mild steel, or substantial brick, concrete and other materials that may give hard cover to potential suspects. In limited circumstances, these weapons can also be used to disable the engine block of a vehicle posing a clear and present threat to the public (i.e., a vehicle laden with explosives).

Training Requirements: SWAT Snipers receive specific .50 caliber rifle training and must undergo regular training and weapons qualifications to be able to deploy the .50 caliber rifle.

Fiscal Impact: See Appendix A

Lifespan: EDM ARMS – Barrel life rated to approximately 20,000 rounds.

a. **EDM ARMS Windrunner -** (Quantity: 1)
Manufacturer: Bushmaster Firearms
Description: The Windrunner is built to outshine all previous standards for long-range accuracy.

F. Ammunition of .50 caliber or greater

1. **.50 Caliber Rifle Ammunition:** Rifle ammunition manufactured specifically for .50 caliber Special Application Rifles. This caliber is also referred to as .50 BMG.

Match Ammunition: Designed for when greater distance from a target is encountered and accuracy is needed. Match ammunition rounds excel against heavy barriers and penetrating thick glass.

Fiscal Impact: See Appendix A

Lifespan: Approximately 10-year shelf life.

a. **A-Max Match Ammo - .50 BMG 750 grain** (Quantity: See Appendix A)
Manufacturer: Engel Ballistic Research
Description: 50BMG match grade 750 grain. Match ammunition rounds excel against heavy barriers and penetrating thick glass.

G. Specialized firearms and ammunition of less than .50 caliber, including assault weapons

1. **AR-15 Rifles:** A semi-automatic shoulder-fired long gun that fires a rifle caliber cartridge. The Department-approved AR-15 style weapon system is designed to fire a .223/5.56 caliber projectile.

   Capability/Usage: The rifle caliber carbine provides officers the ability to engage hostile suspects at distances generally greater than the effective distance of their handguns. Additionally, AR-15 rifles offer advantages over handguns, such as increased accuracy potential and the ability to defeat soft body armor but are not appropriate for every situation.

   Training Requirements: All officers attend a POST rifle course and regularly qualify with their rifle. SWAT Officers partake in regular rifle training, and consistent weapons qualifications to maintain proficiency with the AR-15.

   Fiscal Impact: See Appendix A

   Lifespan: Colt M4 Carbine LWRC IC-45 – Barrel life rated to approximately 12,000 rounds.

   Colt M4 Carbine – Barrel life rated to approximately 12,000 rounds.

   a. **Colt M4 Carbine LWRC M6IC** (Quantity: 142)
      Manufacturer: LWRC International
      Description: Colt style M4 rifle chambered in .223 caliber. These rifles are outfitted with a collapsible stock and flashlight.

   b. **Colt M4 Carbine** (Quantity: 158)
      Manufacturer: Colt Manufacturing LLC
      Description: Colt M4 rifle chambered in .223 caliber. These rifles are outfitted with a collapsible stock.

2. **.308 Caliber Rifles:** Rifle's chambered in a .308 caliber round. These rifles are set up as a semi-automatic rifle or a bolt action. They can be outfitted with various optics and accessories depending on the mission.

   Capability / Usage: The .308 rifle provides SWAT Snipers and Air Support personnel the ability to engage hostile suspects at great distances with accuracy. The .308 rifle platform are typically deployed with the SWAT Team during high-risk SWAT operations and special events or instances wherein Sniper Over Watch Teams are needed. These rifles can also be deployed by the Ontario Air Support Unit for similar situations.

   Training Requirements: SWAT team members and the Air Support Unit regularly train and qualify with various weapons systems including the .308 rifle to maintain proficiency.

Fiscal Impact: See Appendix A

Lifespan: HK 91 – Barrel life rated to approximately 3,000 to 6,000 rounds.
Tactical Ops Tango 51– Barrel life rated to approximately 5,000 rounds.
Sig Sauer 716 – Barrel life rated to approximately 3,000 to 6,000 rounds.

Fiscal Impact: See Appendix A

a. **HK 91 Rifle** (Quantity: 1)
Manufacturer: Heckler and Koch
Description: Semi-automatic .308 rifle with optic attached.

b. **Tactical Ops Tango 51 .308 Bolt Action Rifle** (Quantity: 6)
Manufacturer: Accuracy International
Description: The bolt action Tango 51 is chambered in .308 caliber and is a bolt action rifle.

c. **Sig Sauer 716 Rifle** (Quantity: 2)
Manufacturer: Sig Sauer
Description: Semi-automatic .308 rifle with optic attached.

3. **MP-5 Submachine Guns:** A compact, modular, lightweight, shoulder fired, submachine gun capable of semi-automatic or automatic fire chambered in 9mm.

Capability / Usage: The MP-5 submachine gun provides the ability to deliver precision gun fire with a shoulder fired weapons system that is accurate, reliable, and safe. Its compact design allows for ease of maneuverability when operating in the open or within interior environments. The use of the MP-5 submachine gun is relegated to SWAT officers.

Training Requirements: Officers authorized to carry the MP-5 have completed numerous hours of live fire and movement training. Additionally, officers authorized to use the MP-5 must complete weapons qualifications on a regular basis to maintain proficiency.

Fiscal Impact: See Appendix A

Lifespan: Barrel life rated for approximately 50,000+ rounds.

a. **HK MP5 Submachine Gun** (Quantity: 8)

Manufacturer: Heckler & Koch

Description: Probably the most popular series of submachine guns in the world, it functions according to the proven roller-delayed blowback principle. Tremendously reliable, with maximum safety for the user, easy to handle, modular, extremely accurate and extraordinarily easy to control when firing.

4. **.223 Caliber or 5.56mm Rifle Ammunition:** Rifle ammunition manufactured specifically for rifles chambered in 5.56mm or .223 Remington. Currently there are two types of .223/5.56mm caliber rifle ammunition in use operationally by the Department.

   Capability / Usage: .223 caliber or 5.56mm rifle ammunition used in conjunction with an AR-15 type rifle provides officers the ability to engage hostile suspects at distances generally greater than the effective distance of their handguns. Rifle ammunition fired from AR-15 rifles offer advantages over handguns, such as increased accuracy potential and the ability to defeat soft body armor but are not appropriate for every situation. For the SWAT Team, the AR-15 is the primary weapons system utilized by the team. SWAT Officers regularly utilize the AR-15 as their primary weapons system on tactical operations.

   Training Requirements: Officers receive POST training and regularly qualify with their weapon.

   Fiscal Impact: See Appendix A

   Lifespan: Approximately 10-year shelf life.

   The Department currently possesses the following types of .223 caliber or 5.56mm rifle ammunition:

   a. **Federal – FMJ .223 55 grain** (Quantity: 100,000)
      Manufacturer: Federal
      Description: American Eagle rifle ammunition offers consistent, accurate performance at a price that's perfect for high-volume shooting. The loads feature quality bullets, reloadable brass cases and dependable primers.

   b. **Federal – Gold Dot .223 62 grain** (Quantity: 30,000)
      Manufacturer: Federal
      Description: Gold Dot Duty Rifle brings proven bullet technology to rifle platform. Gold Dot rifle bullets are optimized to ensure expansion out of barrels down to 10" at a wide variety of velocities out to 200 yards.

5. **.308 Caliber Rifle Ammunition:** Rifle ammunition manufactured specifically for rifles chambered in .308 Winchester. Currently there are various types of .308 Winchester caliber rifle ammunition in use by the Department.

   Fiscal Impact: See Appendix A

Lifespan: Approximately 10-year shelf life.
The Department currently possesses the following types of .308 Winchester ammunition:

a. **Federal.308 Winchester LE308TT2 Ammunition** (Quantity: 2,400)
Manufacturer: Federal
Description: Tactical bonded ammunition is made exclusively for law enforcement. It is designed to defeat barriers with minimal deflection.

H. Flashbangs, Chemical Agents, Chemical Agent Delivery Devices, and Pepper Ball Launchers

1. **Noise Flash Diversionary Devices (NFDD):** Canisters that emit a loud noise and bright light.

Capability / Usage: Diversionary Devices are capable of releasing large amounts of stored energy in the form of heat, light, pressure, and noise. They are intended to temporarily distract, confuse, and disorient subjects. They can also be used as "attention-getting" devices. Diversionary Devices are to be used exclusively by the SWAT team. Noise Flash Diversionary Devices can be used in high-risk tactical operations as an attention getting device. They can also be used during high-risk warrants, and hostage rescue incidents to provide an added degree of officer safety by disorienting subjects.

Training Requirements: SWAT Officers regularly train on safe device deployment in a variety of operational settings.

Fiscal Impact: See Appendix A

Lifespan: Defense Technology Multi Port Distraction Device – Five (5) year shelf life.

Liberty Dynamics Distraction Device –Five (5) year shelf life.

The Department currently possesses the following types of Diversionary Devices:

a. **Defense Technology Multi Port Distraction Device** (Quantity: 80)
Manufacturer: Defense Technology
Description: These noise flash diversionary devices have a highly reliable functionality and very precise delay times.

b. **Defense Technology Multi-bang** (Quantity: 3)
Manufacturer: Defense Technology

Description: This distraction device is capable of multiple consecutive detonations on one device.

c. **Low-roll Distraction Device (Training Device)** (Quantity: 50)
Manufacturer: Defense Technology
Description: Training device utilizes the same deployment methods with minimal load for training purposes.

d. **Liberty Dynamics Distraction Device** (Quantity: 175)
Manufacturer: Liberty Dynamics
Description: This diversionary device has the binary energetic material contained within the Enhanced Noise Flash Diversionary device allows for drastically lowered volatility levels, creating a vastly safer and more reliable noise-flash event.

2. **Chemical Agents and Chemical Agent Delivery Devices**: Compounds, devices, and delivery systems utilized by SWAT, Mobile Field Force, and patrol officers. Compounds can include irritants such as Chlorobenzalmalononitrile (CS) or an inflammatory agent such as Oleoresin Capsicum (OC) or Pava (synthetic OC). Chemical agents can be liquid, powder, or gaseous. Delivery systems can be pyrotechnic, blast dispersion, OC Fogger, or aerosol.

   Chemical agent delivery devices consist of the following:

   Gas Ram: A metal device resembling a handheld pointed battering ram that can be loaded with a chemical agent canister. The gas ram can be used to introduce chemical agents into a location by piercing the wall, door, or roof of a structure.

   Burn Safe: A cylindrical metal container designed to contain a pyrotechnic chemical agent canister and reduce fire hazard upon deployment into a structure.

   Capability / Usage: Depending on the delivery method, chemical agents are capable of being introduced in close proximity or from a distance. Depending on the type of delivery system and/or quantity, chemical agents can be used to saturate individual suspects, violent crowds, or areas of varied size. Chemical agents are to be used by the SWAT Team, Mobile Field Force, and/or patrol officers. Generally, during high-risk tactical incidents chemical agents can be used to dislodge a suspect from a stronghold location with the least possible danger to citizens, police, and the suspect. Chemical agents can also be used to prevent an armed suspect from accurately firing at citizens and/or officers. They can also be used in limited instances during civil unrest to disperse violent crowds.

Training Requirements: Officers receive regular training on the deployment and use of chemical agents. Officers are required to pass annual qualifications with the use of chemical agents and chemical agent delivery systems in order to maintain proficiency.

Fiscal Impact: See Appendix A

Lifespan: Defense Technology Chemical Agent Canisters and Munitions - Five (5) year shelf life.

Chemical Agent Delivery Devices - No lifespan indicated by manufacturer. Lifespan varies on operational usage and wear.

The Department currently possesses the following types of chemical agents:

a. **SPEDE-HEAT CS Model -** (Quantity: 62)
Manufacturer: Defense Technology
Description: The Spede-Heat CS munition is a high volume, continuous burn it expels its payload in approximately 20-40 seconds. The payload is discharged through four gas ports on top of the canister, three on the side and one on the bottom. This munition holds approximately 2.9 oz. of active agent.

b. **40mm Liquid Ferret -** (Quantity: 175)
Manufacturer: Defense Technology
Description: These launchable munitions are capable of being deployed into a structure, through barriers, to deploy chemical agent into a structure at a safe distance.

c. **Chemical Agent CS Pocket Tactical – Model 1016** (Quantity: 4)
Manufacturer: Defense Technology
Description: The Pocket Tactical CS munition is small, and lightweight. The 0.9 oz. of active agent will burn approximately 20-40 seconds. At 4.75 in. by 1.4 inches in size, it easily fits in most tactical pouches.

d. **Maximum HC Smoke Model 1073 -** (Quantity: 29)
Manufacturer: Defense Technologies
Description: Pyrotechnic smoke grenade used for concealment or as a signaling device.

e. **37mm Multiple Foam Baton – Model 6299** (Quantity: 379)
Manufacturer: Defense Technology
Description: The 37mm foam baton round contains three foam projectiles.

f. **40mm Skat Shell – Model 6172** (Quantity: 62)
Manufacturer: Defense Technology

Description: The 40mm Skat shell is designed to deliver multiple CS canisters from a 40mm launcher. It has a maximum effective range of 80-100 yards.

g. **Instantaneous Blast CS – Model 1042** (Quantity: 52)
Manufacturer: Defense Technology
Description: The instantaneous blast CS munition is designed for indoor or outdoor use; this munitions powder is expelled upon initiation of a small internal detonator that has sufficient force to split the canister at six machined groves on the outside surface.

h. **Pocket Tactical Saf-Smoke – Model 1017** (Quantity: 38)
Manufacturer: Defense Technology
Description: This munition is small and lightweight. It will burn approximately 20-40 seconds.

i. **CS Flameless Tri-Chamber – Model 1032** (Quantity: 43)
Manufacturer: Defense Technology
Description: The flameless tri-chamber allows the contents to burn within an internal can and disperse the agent safely with reduced risk of fire.

j. **CS Triple-Chaser Canister – Model 1026** (Quantity: 52)
Manufacturer: Defense Technology
Description: The triple-chaser CS consists of three separate canisters pressed together with separating charges between each. When deployed, the canisters separate and land approximately 20 feet apart allowing increased area coverage.

k. **40mm Muzzle Blast – Model 6042** (Quantity: 79)
Manufacturer: Defense Technology
Description: The 40mm muzzle blast CS round is widely used as a crowd management tool for the immediate and close deployment.

l. **Gas Ram – Chemical Agent Delivery Device** (Quantity: 3)
Manufacturer: Custom build
Manufacturer Description: The gas ram is a double walled container constructed of steel designed to contain the flames of a pyrotechnic chemical agent canister. There is a large metal probe attached to one end designed to penetrate walls to deploy the chemical agent inside a structure from outside.

m. **Burn Safe – Chemical Agent Delivery Device** (Quantity: 2)
Manufacturer: Burn Safe
Manufacturer Description: The Burn Safe is a double walled container constructed of aluminum. It is designed to contain the flames inside the inner chamber thereby reducing the probability of starting a fire. The Burn Safe allows the introduction of significant amounts of pyrotechnic non-lethal

chemical agent into the target, which increases the probability of a successful resolution.

3. **Pepper Ball Launchers and Pepper Ball Munitions:** A non-lethal munitions system that employs paint ball launchers to fire "pepper balls" that contain powdered synthetic OC in place of the paint. The pepper ball delivery system combines chemical agent exposure with kinetic energy impact to aid in its effectiveness in addressing armed and/or violent individuals or crowds. Pepper ball munitions also include glass breaking rounds.

   Capability / Usage: Pepper ball launchers give officers the ability to address an armed and/or violent suspect(s) with a non-lethal munition that delivers both chemical agent and kinetic energy impact. This combination can be extremely effective in gaining compliance or reducing threat potential with an armed and/or violent suspect(s). Due to its design, pepper balls can be delivered from a larger standoff distance allowing for an added degree of officer safety. Pepper ball launchers and pepper ball munitions can be used to address armed and/or violent individuals or crowds, limited instances of violent civil unrest, suicidal individuals, and individuals believed to possess or have immediate access to a deadly weapon. Pepper ball munitions can be effective in driving suspects from confined spaces or vehicles.

   Training Requirements: Officers undergo regular live fire proficiency training. Additionally, Officers are required to qualify with pepper ball launchers on a consistent basis to maintain proficiency.

   Fiscal Impact: See Appendix A

   Lifespan: Pepper Ball Launcher – No manufacturer life span indicated by manufacturer.

   Pepper Ball Munitions – Approximately three (3) year shelf life.

   The Department currently possesses the following types of pepper ball launchers and pepper ball munitions:

   a. **Tippman FTC Pepper Ball Launcher** (Quantity: 12)
      Manufacturer: Tippman
      Manufacturer Description: The Tippmann FTC paintball marker is a compact marker launcher.

   b. **PepperBall Live –** (Quantity: 4,000)
      Manufacturer: PepperBall
      Description: A potent and powerful concentration of PAVA pepper powder. One round of LIVE-X contains 2% PAVA.

c. **PepperBall Glass Breaker –** (Quantity:80)
Manufacturer: PepperBall
Description: Used to break side glass of vehicles and residential glass windows.

d. **PepperBall Inert –** (Quantity: 3,000)
Manufacturer: PepperBall
Description: Containing a harmless, scented powder, this projectile is best suited for training, qualifications, and direct impact when chemical exposure is not desired.

I. Extended Range Impact Weapons, Projectile Launcher Platforms, Munitions, and Specialty Impact Munitions (SIM)

1. **40mm Launchers (Projectile Launch Platforms):** A single shot or multi-shot Extended Range Impact Weapon launcher capable for firing a variety of 40mm rounds. The Department also has a limited inventory of 37mm launchers that share the same characteristics as 40mm launchers but are chambered for 37mm munitions.

   Capability / Usage: 40mm launchers are capable of firing a variety of munitions with a maximum effective range of one hundred twenty (120) feet. 40mm launchers can deliver 40mm munitions in the form of chemical agents, and sponge baton rounds. The 40mm launchers utilized with less lethal sponge baton rounds are designed to impact armed and/or violent suspects so officers can gain compliance, overcome resistance, or prevent serious injury or death to bystanders, officers, and the suspect. 40mm single launchers combined with less lethal 40mm sponge baton rounds are authorized to be used by any officer that has been trained in its use and maintains current qualifications.

   Training Requirements: Officers that have been trained in the use of the 40mm single launcher undergo thorough training in its use. Additionally, officers trained in the use of the 40mm single launcher must pass annual qualifications to maintain proficiency.

   Fiscal Impact: See Appendix A

   Lifespan:

   Defense Technology 40mm Launchers – Two (2) year limited warranty. No lifespan indicated by manufacturer. Dependent on operational usage and wear.

   Defense Technology 37mm Launchers – No lifespan indicated by manufacturer. Lifespan varies on operational usage and wear.

The Department currently possesses the following types of 40mm launchers:

a. **Def Tech – Model 1425** (Quantity: 11)
Manufacturer: Defense Technology
Description: The 40mm will fire standard 40mm Less Lethal ammunition, up to 4.8 inches in cartridge length.

b. **LMT – 40mm Launcher** (Quantity: 20)
Manufacturer: Lewis Machine & Tool
Description: The 40mm will fire standard 40mm Less Lethal ammunition, up to 4.8 inches in cartridge length.

c. **Def-Tec – Model 1415** (Quantity: 4)
Manufacturer: Defense Technology
Manufacturer Description: The 37mm will fire standard 37mm Less Lethal ammunition, up to 8 inches in cartridge length.

d. **Def-Tec 40mm 6-Shot Launcher** (Quantity: 2)
Manufacturer: Defense Technology
Description: Designed for riot and tactical situations, the 40mm 6-Shot Launcher is low-profile and lightweight, providing multi-shot capability in an easy to carry launcher.

2. **40mm Ammunition:** The 40MM round is a sponge baton cartridge. The sponge round has a blue-colored nose with a black base. The casing is stainless.

Fiscal Impact: See Appendix A

Lifespan: Five (5) year shelf life.

The Department currently possesses the following types of 40mm direct impact ammunition:

a. **eXact iMpact 40mm Sponge Round – Model 6325** (Quantity: 900)
Manufacturer: Defense Technology
Description: The eXact iMpact 40 mm Sponge Round is a point-of-aim, point-of-impact direct-fire round. This lightweight, high-speed projectile consisting of a plastic body and sponge nose that is spin stabilized via the incorporated rifling collar and the 40 mm launcher's rifled barrel. Used for Crowd Control, Patrol, and Tactical Applications.

J. Night Vision Equipment and Infrared Sighting Systems

1. **Night Vision Optical Devices:** A night-vision device (NVD), also known as night optical/observation device (NOD) or night-vision goggles (NVG) is an

optoelectronic device that allows images to be produced in low levels of light approaching total darkness.

Capability / Usage: Night Vision Optical Devices provide the user the ability to see an enhanced image during darkness. The use of this equipment allows a tactical advantage for officers especially when operating in low light or dark environments. The majority of SWAT tactical operations occur at night or are conducted in low light environments. Having NVD's allows for SWAT Officers to have a tactical advantage and an added degree of officer safety when operating in those conditions. The use of NVD's is extremely advantageous during high-risk operations, hostage rescue, active shooter, and tactical operations in a wide range of environments.

Training Requirements: SWAT Officers maintain proficiency by continual training and annual weapons qualifications with NVD's.

Fiscal Impact: See Appendix A

Lifespan: Approximately 10,000 hours.

The Department currently possesses the following types of Night Vision Optical Devices:

a. **Pinnacle Gen3 Night Vision –** (Quantity: 30)
Manufacturer: Night Vision Depot
Description: Pinnacle Gen3 Night Vision Device is a compact, lightweight, high-performance white phosphor dual-tube goggle.

b. **L3 Warrior –** (Quantity: 3)
Manufacturer: L3
Description: The L3 Warrior Night vision scope can be attached quickly to the rifle to allow for enhanced vision during nighttime operations. It works in conjunction with the rifle's optics for improved vision.

2. **Infrared Sighting Systems:** A device attached to a firearm to aid in target acquisition. Unlike optical and iron sights where the user looks through the device to aim at the target, laser sights project a beam onto the target that provides a visual reference point. This device is used in conjunction with NVD's to aid in rapid and accurate target acquisition.

Capability / Usage: This equipment, when combined with NVD's, provide the user the ability to see an enhanced image during low light conditions or darkness. The use of this equipment allows for a tactical advantage for officers. It allows officers to obtain accurate and rapid target acquisition especially when operating in a multitude of low light or dark environments. Most SWAT operations occur at night or are conducted in low light environments. Having NVD's in conjunction

with infrared sighting systems allows for SWAT Officers to have a tactical advantage and an added degree of officer safety when operating in those conditions. The use of NVD's combined with infrared sighting systems are extremely advantageous during high-risk operations, hostage rescue, active shooter, and tactical operations in a wide range of environments. Infrared sighting systems are to be used exclusively by the SWAT Unit. Night Vision optical enhancement devices combined with infrared sighting systems may be utilized during tactical missions with approval from the SWAT Commanding Officer or SWAT Executive Officer.

Training Requirements: SWAT Officers maintain proficiency by continual training and annual weapons qualifications with NVD's and infrared sighting systems.

Fiscal Impact: See Appendix A

Lifespan: Approximately 10,000 hours.

The Department currently possesses the following types of infrared sighting systems:

a. **MAWL IR Designator** (Quantity: 30)
Manufacturer: B.E. Meyers
Description: The MAWL has an IR light and IR laser which work in conjunctions with night vision devices to illuminate and aide in aiming a weapon system.

V. USAGE OF MILITARY EQUIPMENT WHEN COLLABORATING WITH OTHER LAW ENFORCEMENT AGENCIES

On occasion, the Department may be required to assist other law enforcement agencies in a formal Law Enforcement Mutual Aid Request (LEMA) or support with day-to-day operational collaboration (i.e., pursuits, investigative unit assistance, joint law enforcement operations, etc.).

In certain mutual aid or operational collaboration circumstances, it may be necessary for sworn Department members to utilize military equipment in order to fulfill an assigned mission (i.e., civil unrest, SWAT requests, barricaded suspects in a vehicle, etc.). When sworn Department members utilize military equipment in instances of mutual aid or law enforcement collaboration, the following shall apply:

A. Department members are required to adhere to the Department's Military Equipment Procedure and **all** policies and procedures outlined within the Ontario Police Department's Policy and Procedures Manual, regardless of operational jurisdiction.

B. Should the Police Department request mutual aid from another law enforcement agency within the City and military equipment is required during the course of the response, the following shall apply:

1. The Ontario Police Department will remain in charge of the overall incident command.

2. The Incident Commander or designee will brief the supervisor from the assisting agency and inform them of the mission, enforcement posture, and any pertinent information related to the incident.

3. The assisting agency will adhere to their respective policies and procedures, particularly those governing the use of military equipment.

4. If the Incident Commander or their designee is informed of or witnesses the utilization of military equipment by an assisting agency inconsistent with the guidelines set forth in this procedure, the Incident Commander may elect to cancel the request for mutual aid or re-assign the assisting agency to a different support mission.

VI. APPROVAL OF MILITARY EQUIPMENT BY GOVERNING BODY

A. Pursuant to AB-481 all military equipment acquired and/or in use by the Department shall be approved by the governing body by adopting a military use policy. This approval by the governing body must be granted prior to any of the following:

1. Requesting military equipment made available pursuant to Section 2576a of Title of the United States Code. This section is also commonly referred to as the Defense Logistics Agency 1033 Program. The Police Department does not participate in the 1033 Program.
2. Seeking funds for military equipment, including, but not limited to, applying for a grant, soliciting, or accepting private, local, state, or federal funds, in-kind donations, or other donations or transfers.
3. Acquiring military equipment either permanently or temporarily, including by borrowing or leasing.
4. Collaborating with another law enforcement agency in the deployment or other use of military equipment within the territorial jurisdiction of the governing body.
5. Using any new or existing military equipment for a purpose, in a manner, or by a person not previously approved by the governing body.
6. Soliciting or responding to a proposal for, or entering into an agreement with, any other person or entity to seek funds for, apply to receive, acquire, use, or collaborate in the use of, military equipment.
7. Acquiring military equipment through any other means.

B. In seeking approval of the government body for any specified military equipment, the Department shall submit a proposed military equipment use policy to the governing

body and make those documents available on the Department's internet website at least 30 days prior to any public hearing concerning the military equipment at issue.

1. The proposed or final military equipment use policy shall be made publicly available on the Department's internet website for as long as the military equipment is available for use.

VII. ANNUAL MILITARY EQUIPMENT REPORT

A. Pursuant to AB-481, the Department shall submit to the City Council an annual military equipment report for each type of military equipment approved by the governing body within one year of approval, and annually thereafter for as long as the military equipment is available for use. The Department shall also make each annual military equipment report required by this section publicly available on its internet website for as long as the military equipment is available for use. The Commanding Officer or their designee shall be responsible for the preparation and submission of the annual military equipment report. The annual military equipment report shall, at a minimum, include the following information for the immediate previous calendar year for each type of military equipment:

1. A summary of how the military equipment was used and the purpose of its use.
2. A summary of any complaints or concerns received concerning the military equipment.
3. The results of any internal audits, any information about violations of the military equipment use policy, and any actions taken in response, consistent with state law employee privacy restrictions.
4. The total annual cost for each type of military equipment, including acquisition, personnel, training, transportation, maintenance, storage, upgrade, and other ongoing costs, and from what source funds will be provided for the military equipment in the calendar year following submission of the annual military equipment report.
5. The quantity possessed for each type of military equipment.
6. If the Department intends to acquire additional military equipment in the next year, the quantity sought for each type of military equipment.

B. Within 30 days of submitting and publicly releasing the annual military equipment report, the Department shall hold at least one community engagement meeting, at which the general public may discuss and ask questions regarding the annual military equipment report and the Department's funding, acquisition, or use of military equipment.

C. The City Council will determine, based on the annual military equipment report, whether each type of military equipment identified in the report has complied with the standards for approval as set forth by AB 481. If the City Council determines that a type of military equipment identified in the annual military equipment report has

not complied with the standards as set forth by AB 481, it may either disapprove a renewal of the authorization for that type of military equipment or require modifications to this military equipment use procedure in a manner that will resolve lack of compliance.

VIII. MILITARY EQUIPMENT USAGE ACCOUNTABILITY

A. The use of military equipment is subject to individual Department Policies and Procedures, is restricted for use only in certain instances and, in some cases, only by certain units. It is incumbent upon incident commanders, supervisors, and individual officers to recognize the specific circumstances wherein military equipment should be employed to enhance the safety of the public and officers and to bring a critical incident to a safe resolution.

B. Department members are bound to adhere to Department Policies and Procedures, in addition to state and local laws and ordinances when employing the use of the military equipment at any time. Violations of the law or Department Policies or Procedures may result in criminal or administrative investigations and/or actions.

C. Administrative Investigations concerning complaints related to military equipment will be conducted in accordance with department policy. These investigations may be subject to review by the Office of the Chief of Police to ensure that compliance with this military equipment procedure is maintained.

D. Any corrective action or discipline imposed as a result of a violation of this Department Procedure will be administered in accordance with the department policy, relevant employee organization memorandum of understanding (MOU), Civil Service Rules, and state law.

IX. MILITARY EQUIPMENT MAINTENANCE AND INVENTORY

All military equipment shall be maintained and inventoried in accordance with department policy.

X. MILITARY EQUIPMENT COMPLAINTS AND INQUIRIES

In some instances, the application and use of military equipment can cause questions and/or concerns for members of the community. It is of vital importance that community members' questions regarding the application and use of military equipment are addressed.

The Police Department is committed to full and fair investigation of citizen complaints. As such, the Department has sound internal procedures for thorough and impartial investigations of citizen complaints. Resolving complaints in a fair, impartial, and

expeditious manner will ensure the consistent high level of integrity and efficiency maintained by the Department.

A. Complaints directly related to the application or use of military equipment shall be handled in accordance with department policy.

B. The Police Department values open communication and transparency. Community questions and/or concerns regarding the application and use of specified military equipment should be addressed in the following manner:

    1. Via the Department internet website where the public can email specific military equipment related questions to the Department.
    2. At pre-determined Community Engagement Meetings related to military equipment.
    3. At City-Council Meetings related to military equipment.
    4. In all other circumstances, the public should be directed to the Department Military Equipment Procedure and Annual Military Equipment Report available on the Department's internet website.

MILITARY PROCEDURE APPENDIX – A
FISCAL IMPACT – Fiscal Year 2022 (May 2022 – May 2023)

Equipment Name and Model / Manufacturer	Initial Cost	Ongoing Annual Cost FY22 (approximate)
Loki I	$13,600	Varies on Usage
Anafi Thermal	$7,439	Varies on Usage
Evo II	$1,825	Varies on Usage

Equipment Name and Model / Manufacturer	Initial Cost	Ongoing Annual Cost FY22 (approximate)
Dragon Runner	$46,000	Varies on Usage

Equipment Name and Model / Manufacturer	Initial Cost	Ongoing Annual Cost FY22 (approximate)
Bearcat G2 (2 Door)	$205,568	Varies on Usage
Bearcat G3 (4 Door)	$315,835	Varies on Usage
Bearcat G3 (Ramp)	$302,609	Varies on Usage
Rook	$570,000	Varies on Usage

Equipment Name and Model / Manufacturer	Initial Unit Cost	Ongoing Annual Cost FY22 (approximate)
SWAT Equipment Vehicle	$271,715	Varies on Usage
CP131	$124,708	Varies on Usage

Equipment Name and Model / Manufacturer	Initial Cost	Ongoing Annual Cost FY22 (approximate)
Explosive Breaching Kit	$3,850	$202,010 (total SWAT equipment budget)

Equipment Name and Model / Manufacturer	Initial Cost	Ongoing Annual Cost FY22 (approximate)
Remington 870 Breaching Shotgun	$800 Each	$150,000 (total ammo budget)
TKO 12 Gauge Breaching Shotgun Rounds	$8.15 Per Box (6)	$150,000 (total ammo budget)

Equipment Name and Model / Manufacturer	Initial Cost	Ongoing Annual Cost FY22 (approximate)
Windrunner .50 cal	$7,144	Varies on Usage
Match Ammunition - .50 BMG .510" 750 grain	$59 Per Box (10)	$150,000 (total ammo budget)

Equipment Name and Model / Manufacturer	Initial Cost	Ongoing Annual Cost FY22 (approximate)
AR-15 Colt LWRC	$1,949 Each	Varies on Usage
.308 Semi-auto HK91	$3,899 Each	Varies on Usage
.308 Tango 51	$7,999 Each	Varies on Usage
HK MP5	$3,275 Each	Varies on Usage
.380 Sig Sauer 716	$1,350 Each	Varies on Usage
Federal FMJ 55 grain	$179 Per Case	$150,000 (total ammo budget)
Gold Dot .223 62 grain	$287 Per Case	$150,000 (total ammo budget)
HSM 750g A-Max .308	$49 Per Box	$150,000 (total ammo budget)

Equipment Name and Model / Manufacturer	Initial Cost	Ongoing Annual Cost FY22 (approximate)
Def Tec Flashbang	$38.60 Each	$202,010 (total SWAT equipment budget)
Def Tec Multi-bang	$70.00 Each	$202,010 (total SWAT equipment budget)
Training Flash Bang	$58.50 Each	$202,010 (total SWAT equipment budget)
Liberty Dynamics Flash Bang	$18,694 Total	$202,010 (total SWAT equipment budget)
SPEDE Heat	$33.05 Each	$202,010 (total SWAT equipment budget)
40mm CS Ferret	$26.15 Each	$202,010 (total SWAT equipment budget)
Pocket Tactical CS	$28.00 Each	$202,010 (total SWAT equipment budget)
Maximum HC Smoke	$32.60 Each	$202,010 (total SWAT equipment budget)
37mm Foam Baton	$24.50 Each	$202,010 (total SWAT equipment budget)
40mm Skat Shell	$40.65 Each	$202,010 (total SWAT equipment budget)
Instantaneous Blast CS	$54.60 Each	$202,010 (total SWAT equipment budget)
Pocket Tactical Smoke	$32.60 Each	$202,010 (total SWAT equipment budget)
CS Flameless Tri Chamber	$46.25 Each	$202,010 (total SWAT equipment budget)
CS Triple Chaser	$46.25 Each	$202,010 (total SWAT equipment budget)
40mm Muzzle Blast CS	$26.75 Each	$202,010 (total SWAT equipment budget)
Gas Ram	$3,250 Each	$202,010 (total SWAT equipment budget)
Burn Safe	$155.40 Each	$202,010 (total SWAT equipment budget)
Tippman FTC	$499 Each	$13,850 (Department equipment budget)
PepperBall Live	$899 Box	$13,850 (Department equipment budget)
PepperBall Glass Breaker	$3.00 Per Round	$13,850 (Department equipment budget)
PepperBall Inert	$300 Per Case	$13,850 (Department equipment budget)

Equipment Name and Model / Manufacturer	Initial Cost	Ongoing Annual Cost FY22 (approximate)
Def-Tec 40mm Launcher	$985 Each	$13,850 (Department equipment budget)
LMT 40mm Launcher	$985 Each	$13,850 (Department equipment budget)
Def-Tec 37mm Launcher	$884.50 Each	$13,850 (Department equipment budget)
Def-Tec 40mm multi-Launcher	$2,369 Each	$13,850 (Department equipment budget)
eXact iMpact 40mm Sponge Round	$30 Each	$13,850 (Department equipment budget)

Equipment Name and Model / Manufacturer	Initial Cost	Ongoing Annual Cost FY22 (approximate)
Pinnacle Gen3 NODs	$6,995 Each	Varies on Usage
L3 Warrior Optic	$7,999 Each	Varies on Usage
MAWL Designator	$2,999 Each	Varies on Usage

CITY OF ONTARIO *Agenda Report* **April 19, 2022**	**SECTION:** **PUBLIC HEARINGS**
Department: Investments & Revenue Resources Prepared By: Cruz Torres Staff Member Presenting: Armen Harkalyan, Executive Director of Finance Reviewed By: Cecilia House, Armen Harkalyan Approved By:	Submitted To: Council/OHA Approved: _____ Continued To: _____ Denied: _____ Item No: 17

SUBJECT: **A PUBLIC HEARING TO CONSIDER A RESOLUTION CALLING A SPECIAL ELECTION FOR PROPOSED CHANGES TO THE RATE AND METHOD OF APPORTIONMENT OF THE EXISTING SPECIAL TAX OF THE CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH-FACILITIES); A RESOLUTION OF CHANGE, DECLARING RESULTS OF A SPECIAL ELECTION, DETERMINING THAT CHANGES TO THE RATE AND METHOD OF APPORTIONMENT OF THE EXISTING SPECIAL TAX OF COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH-FACILITIES) ARE LAWFULLY AUTHORIZED AND DIRECTING THE RECORDING OF AN AMENDMENT TO NOTICE OF SPECIAL TAX LIEN; AND AN ORDINANCE AMENDING AND RESTATING ORDINANCE NO. 3082 LEVYING SPECIAL TAXES WITHIN THE CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH-FACILITIES); A RESOLUTION DEEMING IT NECESSARY TO AMEND RESOLUTION NO. 2017-124 IN ORDER TO INCREASE THE MAXIMUM AGGREGATE AMOUNT OF BONDED INDEBTEDNESS THAT CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH-FACILITIES) IS AUTHORIZED TO INCUR; A RESOLUTION CALLING A SPECIAL ELECTION FOR CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH-FACILITIES); AND A RESOLUTION DECLARING THE RESULTS OF THE SPECIAL ELECTION.**

RECOMMENDATION: That the City Council consider and:

A. Adopt a Resolution calling a special election for proposed changes to the Rate and Method of Apportionment (the "RMA") of the existing Special Tax of City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South-Facilities), (the "CFD")
B. Adopt a Resolution declaring results of the special election, determining that changes to the Rate and Method of Apportionment of the existing Special Tax of City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South-Facilities) are lawfully authorized and directing recording of an amendment to Notice of Special Tax Lien,
C. Introduce and waive further reading of an Ordinance amending and restating Ordinance No. 3082 levying special taxes within City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South-Facilities).

D. Adopt a resolution deeming it necessary to amend Resolution No. 2017-124 in order to increase the maximum aggregate amount of bonded indebtedness that Community Facilities District No. 35 (Countryside Phase 2 South-Facilities) is authorized to incur;
E. Adopt a Resolution calling a special election for Community Facilities District No. 35 (Countryside Phase 2 South-Facilities); and
F. Adopt a Resolution declaring the results of the special election.

THE FOLLOWING COUNCIL GOALS ARE BEING ACHIEVED:
Operate in a Businesslike Manner
Focus Resources in Ontario's Commercial and Residential Neighborhoods
Ensure the Development of a Well Planned, Balanced, and Self-Sustaining Community in Ontario Ranch

FISCAL IMPACT: The use of Mello-Roos financing for facilities in the residential development of the Countryside Phase 2 South-Facilities project is estimated to generate approximately $42 million in bond proceeds to be used to fund a portion of the public infrastructure improvements needed to serve the project. Mello-Roos bonds are not a direct obligation of the City and are paid from special taxes levied on each taxable parcel in the district; therefore, there is no General Fund impact from the issuance of Mello Roos bonds. City Council approval will be required in future years to process annual special tax levies.

BACKGROUND & ANALYSIS: The Mello-Roos Community Facilities Act of 1982 provides local government the authority to establish a community facilities district for the purpose of financing various kinds of public infrastructure facilities. In October, 2017, the City established CFD No. 35 (Countryside Phase 2 South-Facilities) to finance public improvements for the project. The Countryside Phase 2 South-Facilities project addresses the development of approximately 34.22 gross acres located generally east of the Cucamonga Creek Channel, west of Archibald Avenue, south of Chino Avenue, and north of Schaefer Avenue. At build out, the development is projected to include 235 single-family detached units.

The developer, Lennar Homes of California, LLC (Lennar), has provided a written petition to the City Council to commence change proceedings pursuant to the Act to change the Rate and Method of Apportionment (RMA) of the existing special tax levied within the CFD to reflect recent movements in the housing market which may affect the estimated home price of for-sale units within the CFD. In consideration of such petition, City staff requested a second price point study to be performed by Empire Economics, the City's Price Point Study and Market Absorption Consultant. The City's study was concluded in January 2022 and found that estimated home prices for market comparables had increased approximately 40.2% for the development, as compared to the initial price point study performed in July 2017.

At the City Council meeting on March 15, 2022, the City Council formally accepted the written petition from Lennar and approved Resolution No. 2022-017, a Resolution of Consideration and a Resolution of Intention on the proposal to increase in the maximum aggregate amount of bonded indebtedness that the CFD is authorized to incur from $27,000,000 to $42,000,000 by amending Resolution No. 2017-124 adopted in October 2017, setting the public hearing on the proposed

changes to the RMA for April 19, 2022. In accordance with the requirements of the Resolution of Consideration, the City Clerk has published a notice of the time and place of this hearing pursuant to Section 53322 of the California Government Code at least seven days before the hearing, and the City's special tax consultant has prepared the Amended and Restated Rate and Method of Apportionment; which reflects the overall estimated price point increase of 40.2%. Under the Amended and Restated RMA, certain special tax rates within CFD No. 35 would be increased.

Attached for consideration is the Amended and Restated RMA, the terms of which are consistent with the City Council's adopted Mello-Roos Local Goals and Policies (Resolution No. 2006-021) in all respects. Also attached are Resolutions and an Ordinance for consideration. The first Resolution calls for a special election on the proposition to change the RMA to be held on April 19, 2022. The second Resolution declares the results of the special election and includes a statement from the City Clerk as to the canvass of ballots, and directs the recording of an Amendment to the Notice of Special Tax Lien. The ordinance amends and restates Ordinance No. 3082 levying special taxes within the CFD and reflects the updates included in the Amended and Restated RMA. The third Resolution deems it necessary to amend Resolution No. 2017-124 in order to increase the maximum aggregate amount of bonded indebtedness that the district is authorized to incur from $27,000,000 to $42,000,000. The fourth Resolution calls for a special landowner election be held on April 19, 2022 to approve the proposed increase in the maximum aggregate amount of bonded indebtedness that the CFD is authorized to incur. The fifth Resolution declares the results of the special election, determining that the maximum aggregate amount of bonded indebtedness that the CFD is authorized to incur shall be increased from $27,000,000 to $42,000,000.

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, CALLING A SPECIAL ELECTION FOR PROPOSED CHANGES TO THE RATE AND METHOD OF APPORTIONMENT OF THE EXISTING SPECIAL TAX OF CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH - FACILITIES).

WHEREAS, the City Council (the "City Council") of the City of Ontario (the "City") has previously established City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities) (the "Community Facilities District") pursuant to the Mello-Roos Community Facilities Act of 1982 (the "Act"); and

WHEREAS, on March 15, 2022, the City Council adopted a resolution entitled "A Resolution of the City Council of the City of Ontario, California, of Consideration to Change the Rate and Method of Apportionment of the Existing Special Tax of City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities)" (the "Resolution of Consideration") proposing changes to the rate and method of apportionment of the special tax (the "Special Tax") levied within the Community Facilities District so as to increase certain of the Special Tax rates thereunder and setting the date for a public hearing to be held on such proposed changes; and

WHEREAS, pursuant to the Resolution of Consideration, notice of said public hearing was published in the *Inland Valley Daily Bulletin*, a newspaper of general circulation published in the area of the Community Facilities District, in accordance with the Act; and

WHEREAS, on this date, the City Council opened, conducted and closed said public hearing; and

WHEREAS, at the hearing, the testimony of all persons for or against the proposed changes to the rate and method of apportionment of the Special Tax was heard; and

WHEREAS, written protests against the proposed changes to the rate and method of apportionment of the Special Tax tax were not made or filed at or before said hearing by 50% or more of the registered voters, or six registered voters, whichever is more, residing within the Community Facilities District, or the owners of one-half or more of the area of land in the territory included in the Community Facilities District and not exempt from the Special Tax; and

WHEREAS, pursuant to the provisions of the Resolution of Consideration, the proposition to change the rate and method of apportionment of the Special Tax is to be submitted to the qualified electors of the Community Facilities District as required by the Act; and

WHEREAS, the City Council desires to designate the City Clerk of the City (the "City Clerk") as the election official for the special election provided for herein; and

WHEREAS, there has been filed with the City Clerk of the City a letter from the Registrar of Voters of the County of San Bernardino indicating that no persons were registered to vote within the territory included in the Community Facilities District as of March 17, 2022, and, accordingly, that 12 or more persons have not been registered to vote within the territory included in the Community Facilities District for each of the 90 days preceding the close of said public hearing; and

WHEREAS, there has been filed with the City Clerk consents and waivers of all of the landowners of record in the Community Facilities District waiving any time limit specified by Section 53326 of the Act and any requirement pertaining to the conduct of said special election, consenting to the holding of said special election on April 19, 2022 and waiving any impartial analysis, arguments or rebuttals, as set forth in Sections 53326 and 53327 of the Act; and

WHEREAS, the City Clerk has concurred in said waivers and has concurred in holding said special election on April 19, 2022.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Ontario as follows:

SECTION 1. The foregoing recitals are true and correct, and the City Council so finds and determines.

SECTION 2. The proposed changes to the rate and method of apportionment of the Special Tax are modifications that increase certain of the Special Tax rates thereunder. The proposed changes are reflected in the City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities) Amended and Restated Rate and Method of Apportionment of Special Tax (the "Restated Rate and Method") attached hereto as Exhibit A, which is by this reference incorporated herein.

SECTION 3. The proposed changes to the rate and method of apportionment of the Special Tax have not been precluded by majority protest pursuant to Section 53338 of the Act.

SECTION 4. Pursuant to Section 53338 of the Act, the proposition to change the rate and method of apportionment of the Special Tax so as to increase certain of the Special Tax rates thereunder, as reflected in the Restated Rate and Method, shall be submitted to the qualified electors of the Community Facilities District at an election called therefor as provided herein.

SECTION 5. The City Clerk is hereby designated as the official to conduct said election.

SECTION 6. The City Council hereby finds and determines that no persons were registered to vote within the territory included in the Community Facilities District as of March 17, 2022, and that 12 or more persons have not been registered to vote within the territory included in the Community Facilities District for each of the 90 days preceding the close of the public hearing heretofore held by the City Council on the proposed changes to the rate and method of apportionment of the Special Tax. Accordingly,

pursuant to Section 53326 of the Act, the vote shall be by the landowners of the Community Facilities District and each person who is the owner of land as of the close of said public hearing, or the authorized representative thereof, shall have one vote for each acre or portion of an acre that he or she owns within the Community Facilities District not exempt from the Special Tax.

SECTION 7. The City Council hereby finds and determines that the qualified electors of the Community Facilities District have unanimously consented (a) to the waiver of any time limit specified by Section 53326 of the Act and any requirement pertaining to the conduct of said election, (b) to the holding of said election on April 19, 2022, and (c) to the waiver of any impartial analysis, arguments or rebuttals, as set forth in Sections 53326 and 53327 of the Act. The City Council herby finds and determines that the City Clerk has concurred in said waivers and has concurred in holding said election on April 19, 2022.

SECTION 8. The City Council hereby calls a special election to submit to the qualified electors of the Community Facilities District the proposition to change the rate and method of apportionment of the Special Tax so as to increase certain of the Special Tax rates thereunder, as reflected in the Restated Rate and Method, which election shall be held at 303 East B Street, Ontario, California, on April 19, 2022. The City Council has caused to be provided to the City Clerk, as the official to conduct said election, the Resolution of Consideration, a certified map of sufficient scale and clarity to show the boundaries of the Community Facilities District, and a sufficient description to allow the City Clerk to determine the boundaries of the Community Facilities District.

The voted ballots shall be returned to the City Clerk not later than 7:30 p.m. on April 19, 2022; provided, however, that if all of the qualified electors have voted prior to such time, the election may be closed with the concurrence of the City Clerk.

SECTION 9. Pursuant to Section 53326 of the Act, the election shall be conducted by mail or hand-delivered ballots pursuant to Section 4000 *et. seq.* of the California Elections Code. Except as otherwise provided in the Act, the provisions of law regulating elections of the City, insofar as they may be applicable, will govern the election.

SECTION 10. The form of the ballot for said election is attached hereto as Exhibit B and by this reference incorporated herein, and such form of ballot is hereby approved. The City Clerk shall cause to be delivered to each of the qualified electors of the Community Facilities District a ballot in said form. Each ballot shall indicate the number of votes to be voted by the respective landowner to which it pertains.

Each ballot shall be accompanied by all supplies and written instructions necessary for the use and return of the ballot. The identification envelope for return of the ballot shall be enclosed with the ballot, shall have the return postage prepaid, and shall contain (a) the name and address of the landowner, (b) a declaration, under penalty of perjury, stating that the voter is the owner of record or the authorized representative of the landowner entitled to vote and is the person whose name appears on the identification envelope, (c) the printed name, signature and address of the voter, (d) the date of signing and place of execution of the declaration described in clause (b), above, and (e) a notice that the envelope contains an official ballot and is to be opened only by the canvassing board.

Analysis and arguments with respect to the ballot proposition are hereby waived, as provided in Section 53327 of the Act.

SECTION 11. The City Clerk shall accept the ballots of the qualified electors in the office of the City Clerk at 303 East B Street, Ontario, California, to and including 7:30 p.m. on April 19, 2022, whether said ballots be personally delivered or received by mail. The City Clerk shall have available ballots that may be marked at said location on the election day by said qualified electors.

SECTION 12. All actions heretofore taken by the officers, employees and agents of the City with respect to the proposed changes to the rate and method of apportionment of the Special Tax, or in connection with or related to any of the documents referred to herein, are hereby approved, confirmed and ratified.

SECTION 13. The officers, employees and agents of the City are hereby authorized and directed to take all actions and do all things that they, or any of them, may deem necessary or desirable to accomplish the purposes of this Resolution and not inconsistent with the provisions hereof.

SECTION 14. This Resolution shall take effect immediately upon its adoption.

The City Clerk of the City of Ontario shall certify as to the adoption of this Resolution.

PASSED, APPROVED AND ADOPTED this 19th day of April 2022.

_____
PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO FORM:

_____
BEST BEST & KRIEGER, LLP
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. 2022- was duly passed and adopted by the City Council of the City of Ontario at their regular meeting held April 19, 2022 by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

The foregoing is the original of Resolution No. 2022- duly passed and adopted by the Ontario City Council at their regular meeting held April 19, 2022.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

EXHIBIT A

CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH - FACILITIES) AMENDED AND RESTATED RATE AND METHOD OF APPORTIONMENT OF SPECIAL TAX

EXHIBIT B

OFFICIAL BALLOT

CITY OF ONTARIO
April 19, 2022

SPECIAL ELECTION

This ballot is for a special, landowner election. The number of votes to be voted pursuant to this ballot is ____.

INSTRUCTIONS TO VOTERS:

To vote on the measure, mark a cross (+ or X) in the voting square after the word "YES" or after the word "NO". All distinguishing marks or erasures are forbidden and make the ballot void. If you wrongly mark, tear, or deface this ballot, return it to the City Clerk of the City of Ontario and obtain another.

CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 35
(COUNTRYSIDE PHASE 2 SOUTH - FACILITIES)

MEASURE SUBMITTED TO VOTE OF VOTERS: Shall the rate and method of apportionment of the special tax levied within City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities) (the "Community Facilities District") be changed so as to increase certain of the special tax rates thereunder, all as specified in the Resolution entitled "A Resolution of the City Council of the City of Ontario, California, Calling A Special Election for Proposed Changes to the Rate And Method of Apportionment of the Existing Special Tax of City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities)," adopted by the City Council of the City of Ontario on April 19, 2022?

Yes: ☐

No: ☐

EXHIBIT A

CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 35
(COUNTRYSIDE PHASE 2 SOUTH – FACILITIES)
AMENDED AND RESTATED
RATE AND METHOD OF APPORTIONMENT OF SPECIAL TAX

A Special Tax shall be levied on all Assessor's Parcels in the City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South – Facilities) ("CFD No. 35") and collected each Fiscal Year, commencing in Fiscal Year 2018-19, in an amount determined by the City Council of the City of Ontario through the application of the Rate and Method of Apportionment, as described below. All of the real property in CFD No. 35, unless exempted by law or by the provisions hereof, shall be taxed for the purposes, to the extent, and in the manner herein provided.

A. DEFINITIONS

The terms hereinafter set forth have the following meanings:

"Acre" or **"Acreage"** means the land area of an Assessor's Parcel as shown on an Assessor's Parcel Map, or if the land area is not shown on an Assessor's Parcel Map, the land area shown on the applicable Final Subdivision Map, parcel map, condominium plan, or other recorded County map.

"Act" means the Mello-Roos Community Facilities Act of 1982, as amended, being Chapter 2.5 of Part 1 of Division 2 of Title 5 of the California Government Code.

"Administrative Expenses" means the following actual or reasonably estimated costs directly related to the administration of CFD No. 35: the costs of computing the Special Taxes and preparing the annual Special Tax collection schedules (whether by the City or CFD No. 35 or both); the costs of collecting the Special Taxes (whether by the County or otherwise); the costs of remitting the Special Taxes to the Trustee; the costs of the Trustee (including its legal counsel) in the discharge of the duties required of it under the Indenture; the costs to the City or CFD No. 35 of complying with arbitrage rebate requirements; the costs to the City or CFD No. 35 of complying with City, CFD No. 35, or obligated persons disclosure requirements associated with applicable federal and state securities laws and of the Act; the costs associated with preparing Special Tax disclosure statements and responding to public inquiries regarding the Special Taxes; the costs of the City or CFD No. 35 related to the analysis and reduction, if any, of the Special Tax on Single Family Property in accordance with Section C.1 herein; the costs of the City or CFD No. 35 related to an appeal of the Special Tax; the costs associated with the release of funds from any escrow account; the City's administration fees and third party expenses; the costs of City staff time and reasonable overhead relating to CFD No. 35; and amounts estimated or advanced by the City or CFD No. 35 for any other

administrative purposes of the CFD, including attorney's fees and other costs related to commencing and pursuing to completion any foreclosure of delinquent Special Taxes.

"Assessor's Parcel" means a lot or parcel shown in an Assessor's Parcel Map with an assigned Assessor's Parcel Number.

"Assessor's Parcel Map" means an official map of the Assessor of the County designating parcels by Assessor's Parcel Number.

"Assessor's Parcel Number" means, with respect to an Assessor's Parcel, that number assigned to such Assessor's Parcel by the County for purposes of identification.

"Assigned Special Tax" means the Special Tax for each Land Use Class of Developed Property, as determined in accordance with Section C.1.a.2 below.

"Backup Special Tax" means the Special Tax for each Land Use Class of Developed Property, as determined in accordance with Section C.1.a.3 below.

"Bonds" means any bonds or other debt (as defined in Section 53317(d) of the Act) issued by CFD No. 35 under the Act and payable from Special Taxes.

"Buildable Lot" means an individual lot, within a Final Subdivision Map or an area expected by CFD No. 35 to become Final Mapped Property, such as the area within a Tentative Tract Map, for which a building permit may be issued without further subdivision of such lot.

"CFD Administrator" means an official of the City responsible for determining the Special Tax Requirement, providing for the levy and collection of the Special Taxes, and performing the other duties provided for herein.

"CFD No. 19" means City of Ontario Community Facilities District No. 19 (Countryside Phase 1 – Services).

"CFD No. 35" means City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South – Facilities).

"City" means the City of Ontario, California.

"City Council" means the City Council of the City, acting as the legislative body of CFD No. 35.

"Contractual Impositions" means (a) a voluntary contractual assessment established and levied on an Assessor's Parcel pursuant to Chapter 29 of Part 3 of Division 7 of the California Streets and Highways Code (commencing with Section 5898.10 *et seq.*), as amended from time to time, (b) a special tax established and levied on an Assessor's Parcel pursuant to Section 53328.1 of the California Government Code and related provisions of the Act, as amended from time to time, and (c) any other fee, charge, tax, or assessment established and levied on an individual Assessor's Parcel pursuant to a

contractual agreement or other voluntary consent by the owner thereof (e.g., property owner association assessments).

"County" means the County of San Bernardino.

"Designated Buildable Lot" means a Buildable Lot for which a building permit has not been issued by the City as of the date of calculation of the Backup Special Tax.

"Developed Property" means for each Fiscal Year, all Taxable Property, exclusive of Final Mapped Property, Taxable Property Owner Association Property, and Taxable Public Property, for which a building permit or other applicable permit for new construction was issued after January 1, 2017, and before May 1 of the prior Fiscal Year.

"Expected Residential Lot Count" means 235 Buildable Lots of Single Family Property or, as determined by the CFD Administrator, the number of Buildable Lots of Single Family Property based on the most recent Tentative Tract Map(s) or most recently recorded Final Subdivision Map(s) or modified Final Subdivision Map(s).

"Facilities" means the public facilities authorized to be financed, in whole or in part, by CFD No. 35.

"Final Mapped Property" means, for each Fiscal Year, all Taxable Property, exclusive of Developed Property, Taxable Property Owner Association Property, and Taxable Public Property, which as of January 1 of the previous Fiscal Year was located within a Final Subdivision Map. The term Final Mapped Property shall include any parcel map or Final Subdivision Map, or portion thereof, that creates individual lots for which a building permit may be issued, including Parcels that are designated as a remainder Parcel (i.e., one where the size, location, etc., precludes any further subdivision or taxable use).

"Final Subdivision Map" means a final tract map, parcel map, or lot line adjustment approved by the City pursuant to the Subdivision Map Act (California Government Code Section 66410 et seq.) or a condominium plan recorded in accordance with California Civil Code Section 4285 that, in either case, creates individual lots for which building permits may be issued without further subdivision.

"Fiscal Year" means the period starting July 1 and ending on the following June 30.

"Indenture" means the indenture, fiscal agent agreement, resolution, or other instrument pursuant to which Bonds are issued, as modified, amended, and/or supplemented from time to time.

"Land Use Class" means any of the classes listed in Table 1 below.

"Lower Income Household Welfare Exemption Property" means, for each Fiscal Year, an Assessor's Parcel within the boundaries of CFD No. 35 that is subject to a welfare exemption under subdivision (g) of Section 214 of the California Revenue and

Taxation Code (or any successor statute), as indicated in the most recent County assessor's roll finalized prior to such Fiscal Year.

"Maximum Special Tax" means, with respect to an Assessor's Parcel of Taxable Property, the Maximum Special Tax determined in accordance with Section C.1 below that can be levied in any Fiscal Year on such Assessor's Parcel of Taxable Property.

"Minimum Sale Price" means the minimum price at which Units of a given Land Use Class have sold or are expected to be sold in a normal marketing environment and shall not include prices for such Units that are sold at a discount to expected sales prices for the purpose of stimulating the initial sales activity with respect to such Land Use Class.

"Non-Residential Property" means all Assessor's Parcels of Developed Property for which a building permit was issued by the City permitting the construction of one or more non-residential structures or facilities.

"Other Residential Property" means all Assessor's Parcels of Developed Property for which a building permit was issued by the City for purposes of constructing Units, excluding Single Family Attached Property and Single Family Detached Property.

"Outstanding Bonds" means all Bonds which are outstanding under and in accordance with the provisions of the Indenture.

"Price Point Consultant" means any consultant or firm of such consultants selected by CFD No. 35 that (a) has substantial experience in performing price point studies for residential units within community facilities districts established under the Act or otherwise estimating or confirming pricing for residential units in such community facilities districts, (b) has recognized expertise in analyzing economic and real estate data that relates to the pricing of residential units in such community facilities districts, (c) is in fact independent and not under the control of CFD No. 35 or the City, (d) does not have any substantial interest, direct or indirect, with or in (i) CFD No. 35, (ii) the City, (iii) any owner of real property in CFD No. 35, or (iv) any real property in CFD No. 35, and (e) is not connected with CFD No. 35 or the City as an officer or employee thereof, but who may be regularly retained to make reports to CFD No. 35 or the City.

"Price Point Study" means a price point study or a letter updating a previous price point study prepared by the Price Point Consultant pursuant to Section C herein.

"Property Owner Association Property" means, for each Fiscal Year, any property within the boundaries of CFD No. 35 that was owned by a property owner association, including any master or sub-association, as of January 1 of the prior Fiscal Year.

"Proportionately" means (a) for Developed Property in the first step of Section D below, that the ratio of the actual Special Tax levy to the Maximum Special Tax is equal for all Assessor's Parcels of Developed Property; however, for Developed Property in the fourth step of Section D below, Proportionately means that the amount of the increase above the Assigned Special Tax, if necessary, is equal for all Assessor's Parcels of Developed Property, except that if the Backup Special Tax limits the increase on any

Assessor's Parcel(s), then the amount of the increase shall be equal for the remaining Assessor's Parcels; (b) for Final Mapped Property, that the ratio of the actual Special Tax levy to the Maximum Special Tax is equal for all Assessor's Parcels of Final Mapped Property; (c) for Undeveloped Property, that the ratio of the actual Special Tax levy to the Maximum Special Tax is equal for all Assessor's Parcels of Undeveloped Property; (d) for Taxable Property Owner Association Property, that the ratio of the actual Special Tax levy to the Maximum Special Tax is equal for all Assessor's Parcels of Taxable Property Owner Association Property; and (e) for Taxable Public Property, that the ratio of the actual Special Tax levy to the Maximum Special Tax is equal for all Assessor's Parcels of Taxable Public Property.

"Public Property" means, for each Fiscal Year, property within the boundaries of CFD No. 35 that is (a) owned by, irrevocably offered to, or dedicated to the federal government, the State, the County, the City, or any local government or other public agency or (b) encumbered by an easement for purposes of public or utility right-of-way that makes impractical its use for any purpose other than that set forth in such easement, provided that any property leased by a public agency to a private entity and subject to taxation under Section 53340.1 of the Act shall be taxed and classified according to its use.

"Rate and Method of Apportionment" means this Amended and Restated Rate and Method of Apportionment of Special Tax.

"Residential Floor Area" means all of the Square Footage of living area within the perimeter of a Unit, not including any carport, walkway, garage, overhang, patio, enclosed patio, or similar area. The determination of Residential Floor Area shall be as set forth in the building permit(s) issued for such Assessor's Parcel, or as set forth in other official records maintained by the City's Building Department or other appropriate means selected by CFD No. 35. The actual Square Footage shall be rounded up to the next whole square foot. Once such determination has been made for an Assessor's Parcel, it shall remain fixed in all future Fiscal Years unless an appeal pursuant to Section F below is approved that results in a change in the actual Square Footage.

"Services" means the services authorized to be financed, in whole or in part, by CFD No. 35.

"Single Family Attached Property" means all Assessor's Parcels of Developed Property for which a building permit or use permit was issued for construction of a residential structure consisting of two or more Units that share common walls, have separate Assessor's Parcel Numbers assigned to them (except for a duplex unit, which may share an Assessor's Parcel with another duplex unit), and may be purchased by individual homebuyers (which shall still be the case even if the Units are purchased and subsequently offered for rent by the owner of the Unit), including such residential structures that meet the statutory definition of a condominium contained in California Civil Code Section 4125.

"Single Family Detached Property" means all Assessor's Parcels of Developed Property for which a building permit was issued for construction of a Unit, on one legal lot, that does not share a common wall with another Unit.

"Single Family Property" means all Assessor's Parcels of Single Family Attached Property and Single Family Detached Property.

"Special Tax" means the special tax authorized by the qualified electors of CFD No. 35 to be levied within the boundaries of CFD No. 35.

"Special Tax Requirement" means for any Fiscal Year that amount required, after taking into account available amounts held in the funds and accounts established under the Indenture, for CFD No. 35 to: (i) pay debt service on all Outstanding Bonds which is due in the calendar year that commences in such Fiscal Year; (ii) pay periodic costs on the Bonds, including, but not limited to, credit enhancement and rebate payments on the Bonds; (iii) pay Administrative Expenses; (iv) provide any amounts required to establish or replenish any reserve fund for the Bonds; (v) pay directly for acquisition or construction of Facilities, or the cost of Services, to the extent that the inclusion of such amounts does not increase the Special Tax levy on Final Mapped Property or Undeveloped Property; (vi) provide an amount equal to Special Tax delinquencies based on the historical delinquency rate for the Special Tax as determined by the CFD Administrator.

"Square Footage" or **"Sq. Ft."** means the floor area square footage reflected on the original construction building permit, or as set forth in other official records maintained by the City's Building Department or other appropriate means selected by CFD No. 35, issued for construction of Single Family Property, Other Residential Property, or Non-Residential Property, plus any square footage subsequently added to a building of Non-Residential Property after issuance of a building permit for expansion or renovation of such building.

"State" means the State of California.

"Taxable Property" means, for each Fiscal Year, all of the Assessor's Parcels within the boundaries of CFD No. 35 that are not exempt from the Special Tax pursuant to law or Section E below.

"Taxable Property Owner Association Property" means, for each Fiscal Year, all Assessor's Parcels of Property Owner Association Property that are not exempt from the Special Tax pursuant to Section E below.

"Taxable Public Property" means, for each Fiscal Year, all Assessor's Parcels of Public Property that are not exempt from the Special Tax pursuant to law or Section E below.

"Tentative Tract Map" means a map: (i) showing a proposed subdivision of an Assessor's Parcel(s) and the conditions pertaining thereto; (ii) that may or may not be based on a detailed survey; and (iii) that is not recorded by the County to create legal lots.

"Total Tax Burden" means, for a Unit within a Land Use Class, for the Fiscal Year in which Total Tax Burden is being calculated, the sum of (a) the Assigned Special Tax for such Land Use Class for such Fiscal Year, plus (b) the CFD No. 19 special tax for such Land Use Class for such Fiscal Year, plus (c) the *ad valorem* property taxes, special assessments, special taxes for any other overlapping community facilities districts, and any other governmental fees, charges (other than fees or charges for services such as sewer and trash), taxes, and assessments (which do not include Contractual Impositions) collected by the County on *ad valorem* tax bills and that the CFD Administrator estimates would be levied or imposed on such Unit in such Fiscal Year if the residential dwelling unit thereon or therein had been completed and sold, and was subject to such fees, charges, taxes, and assessments in such Fiscal Year.

"Trustee" means the trustee or fiscal agent under the Indenture.

"TTM 17449" means Tentative Tract Map No. 17449, the area of which is located within CFD No. 35.

"TTM 17450" means Tentative Tract Map No. 17450, the area of which is located within CFD No. 35.

"Undeveloped Property" means, for each Fiscal Year, all Taxable Property not classified as Developed Property, Final Mapped Property, Taxable Public Property, or Taxable Property Owner Association Property.

"Unit" means an individual single-family detached or attached home, townhome, condominium, apartment, or other residential dwelling unit, including each separate living area within a half-plex, duplex, triplex, fourplex, or other residential structure.

B. ASSIGNMENT TO LAND USE CATEGORIES

Each Fiscal Year, beginning with Fiscal Year 2018-19, all Taxable Property within CFD No. 35 shall be classified as Developed Property, Final Mapped Property, Taxable Public Property, Taxable Property Owner Association Property, or Undeveloped Property and shall be subject to Special Taxes in accordance with the Rate and Method of Apportionment as determined pursuant to Sections C and D below. Assessor's Parcels of Single Family Property shall be assigned to Land Use Classes 1 through 7, as listed in Table 1 below based on the Residential Floor Area of the Units on such Assessor's Parcels. Other Residential Property shall be assigned to Land Use Class 8, and Non-Residential Property shall be assigned to Land Use Class 9.

C. MAXIMUM SPECIAL TAX

1. Special Tax

At least 30 days prior to the issuance of Bonds, the Assigned Special Tax on Developed Property (set forth in Table 1 below) shall be analyzed in accordance with and subject to the conditions set forth in this Section C. At such time, CFD

No. 35 shall select and engage a Price Point Consultant and the CFD Administrator shall request the Price Point Consultant to prepare a Price Point Study setting forth the Minimum Sale Price of Units within each Land Use Class. If based upon such Price Point Study the CFD Administrator calculates that the Total Tax Burden applicable to Units within one or more Land Use Classes of Single Family Property to be constructed within CFD No. 35 exceeds 1.95% of the Minimum Sale Price of such Units, the Assigned Special Tax shall be reduced to the extent necessary to cause the Total Tax Burden that shall apply to Units within such Land Use Class(es) not to exceed 1.95% of the Minimum Sale Price of such Units.

Each Assigned Special Tax reduction for a Land Use Class shall be calculated by the CFD Administrator separately, and it shall not be required that such reduction be proportionate among Land Use Classes. In connection with any reduction in the Assigned Special Tax, the Backup Special Tax shall also be reduced by the CFD Administrator based on the percentage reduction in Maximum Special Tax revenues within the Tentative Tract Map area(s) where the Assigned Special Tax reductions occurred. Upon determining the reductions, if any, in the Assigned Special Tax and Backup Special Tax required pursuant to this Section C, the CFD Administrator shall complete the Certificate of Modification of Special Tax substantially in the form attached hereto as Exhibit A (the "Certificate of Modification"), shall execute such completed Certificate of Modification, and shall deliver such executed Certificate of Modification to CFD No. 35. Upon receipt thereof, if in satisfactory form, CFD No. 35 shall execute such Certificate of Modification. The reduced Assigned Special Tax and Backup Special Tax specified in such Certificate of Modification shall become effective upon the execution of such Certificate of Modification by CFD No. 35.

The Special Tax reductions required pursuant to this section shall be reflected in an amended notice of Special Tax lien, which CFD No. 35 shall cause to be recorded with the County Recorder as soon as practicable after execution of the Certificate of Modification by CFD No. 35. The reductions in this section apply to Single Family Property, but not to Other Residential Property or Non-Residential Property.

a. Developed Property

1) *Maximum Special Tax*

The Maximum Special Tax that may be levied in any Fiscal Year for each Assessor's Parcel classified as Developed Property shall be the greater of (i) the amount derived by application of the Assigned Special Tax or (ii) the amount derived by application of the Backup Special Tax. The Maximum Special Tax shall not increase in future years, other than as calculated pursuant to Section C.1.a.3 below.

2) *Assigned Special Tax*

The Assigned Special Tax that may be levied in any Fiscal Year for each Land Use Class is shown below in Table 1.

TABLE 1
ASSIGNED SPECIAL TAX – DEVELOPED PROPERTY

Land Use Class	Description	Residential Floor Area (Square Footage)	Assigned Special Tax
1	Single Family Property	< 1,501	$3,175 per Unit
2	Single Family Property	1,501 – 1,700	$3,283 per Unit
3	Single Family Property	1,701 – 1,900	$3,449 per Unit
4	Single Family Property	1,901 – 2,100	$3,665 per Unit
5	Single Family Property	2,101 – 2,300	$3,748 per Unit
6	Single Family Property	2,301 – 2,500	$3,881 per Unit
7	Single Family Property	> 2,500	$4,065 per Unit
8	Other Residential Property		$50,380 per Acre
9	Non-Residential Property		$50,380 per Acre

3) *Backup Special Tax*

The Backup Special Tax shall be $3,662 per Unit for Single Family Property. However, if the Expected Residential Lot Count does not equal 235 for Single Family Property, and the City has not issued Bonds, then the Backup Special Tax for Designated Buildable Lots of Single Family Property shall be calculated according to the following formula:

Backup Special Tax = $860,583 ÷ Expected Residential Lot Count for Single Family Property

If any portion of a Final Subdivision Map, or any area expected by CFD No. 35 to become Final Mapped Property, such as the area within TTM 17449, TTM 17450, or any other Tentative Tract Map, changes any time after the City has issued Bonds, causing an adjustment to the number of Designated Buildable Lots, then the Backup Special Tax for all Designated Buildable Lots of Single Family Property subject to the change shall be calculated according to the following steps:

Step 1: Determine the total Backup Special Taxes that could have been collected from Designated

Buildable Lots of Single Family Property prior to the Final Subdivision Map or expected Final Mapped Property change.

Step 2: Divide the amount determined in Step 1 by the number of Designated Buildable Lots of Single Family Property that exists after the Final Subdivision Map or expected Final Mapped Property change.

Step 3: Apply the amount determined in Step 2 as the Backup Special Tax per Unit for Single Family Property.

The Backup Special Tax for an Assessor's Parcel shall not change once an Assessor's Parcel is classified as Developed Property.

b. Final Mapped Property, Taxable Public Property, Taxable Property Owner Association Property, and Undeveloped Property

The Maximum Special Tax for Final Mapped Property, Taxable Public Property, Taxable Property Owner Association Property, and Undeveloped Property shall be $50,380 per Acre, and shall not be subject to increase or reduction and, therefore, shall remain the same in every Fiscal Year.

2. Multiple Land Use Classes on an Assessor's Parcel

In some instances an Assessor's Parcel of Developed Property may contain more than one Land Use Class. The Maximum Special Tax levied on such Assessor's Parcel shall be the sum of the Maximum Special Tax for all Units of Single Family Property and Acres of Other Residential Property and Non-Residential Property (based on the pro rata share of Square Footage between Other Residential Property and Non-Residential Property, according to the applicable building permits, Final Subdivision Map, parcel map, condominium plan, or other recorded County map) located on that Assessor's Parcel.

D. METHOD OF APPORTIONMENT OF THE SPECIAL TAX

Each Fiscal Year, beginning with Fiscal Year 2018-19, the CFD Administrator shall determine the Special Tax Requirement for such Fiscal Year. The Special Tax shall then be levied as follows:

First: If needed to satisfy the Special Tax Requirement, the Special Tax shall be levied Proportionately on each Assessor's Parcel of Developed Property up to 100% of the applicable Assigned Special Tax;

Second: If additional monies are needed to satisfy the Special Tax Requirement after the first step has been completed, then the Special Tax shall be levied Proportionately on each Assessor's Parcel of Final Mapped Property up to 100% of the Maximum Special Tax for Final Mapped Property;

Third: If additional monies are needed to satisfy the Special Tax Requirement after the first two steps have been completed, then the Special Tax shall be levied Proportionately on each Assessor's Parcel of Undeveloped Property up to 100% of the Maximum Special Tax for Undeveloped Property;

Fourth: If additional monies are needed to satisfy the Special Tax Requirement after the first three steps have been completed, then the levy of the Special Tax on each Assessor's Parcel of Developed Property whose Maximum Special Tax is determined through the application of the Backup Special Tax shall be increased Proportionately from the Assigned Special Tax up to the Maximum Special Tax for each such Assessor's Parcel;

Fifth: If additional monies are needed to satisfy the Special Tax Requirement after the first four steps have been completed, then the Special Tax shall be levied Proportionately on each Assessor's Parcel of Taxable Property Owner Association Property up to the Maximum Special Tax for Taxable Property Owner Association Property;

Sixth: If additional monies are needed to satisfy the Special Tax Requirement after the first five steps have been completed, then the Special Tax shall be levied Proportionately on each Assessor's Parcel of Taxable Public Property up to the Maximum Special Tax for Taxable Public Property.

Notwithstanding the above, under no circumstances shall the Special Tax levied in any Fiscal Year on any Assessor's Parcel of Single Family Property or Other Residential Property for which an occupancy permit for private residential use has been issued be increased as a result of delinquency or default by the owner or owners of any other Assessor's Parcel or Assessor's Parcels within CFD No. 35 by more than ten percent above the amount that would have been levied in that Fiscal Year had there never been any such delinquencies or defaults.

E. EXEMPTIONS

No Special Tax shall be levied on up to 2.44 Acres of Public Property and up to 14.12 Acres of Property Owner Association Property. Tax-exempt status will be assigned by the CFD Administrator in the chronological order in which property becomes Public Property or Property Owner Association Property.

Property Owner Association Property or Public Property that is not exempt from the Special Tax under this section shall be subject to the levy of the Special Tax and shall be taxed Proportionately as part of the fifth or sixth step, respectively, in Section D above, up to 100% of the applicable Maximum Special Tax for Taxable Property Owner Association Property and Taxable Public Property. No Special Tax shall be levied in any Fiscal Year on Assessor's Parcels that have fully prepaid the Special Tax obligation pursuant to the formula set forth in Section H.

No Special Tax shall be levied on Lower Income Household Welfare Exemption Property; provided, however, that if, in any Fiscal Year, applicable law does not require that Lower Income Household Welfare Exemption Property be exempt from some portion, or all, of the Special Tax, such portion, or all, of the Special Tax shall be levied on such property in accordance with this Rate and Method of Apportionment based on the Land Use Class to which the Assessor's Parcel is assigned.

F. APPEALS

Any property owner may file a written appeal of the Special Tax with CFD No. 35 claiming that the amount or application of the Special Tax is not correct. The appeal must be filed not later than one calendar year after having paid the Special Tax that is disputed, and the appellant must be current in all payments of Special Taxes. In addition, during the term of the appeal process, all Special Taxes levied must be paid on or before the payment date established when the levy was made.

The appeal must specify the reasons why the appellant claims the Special Tax is in error. The CFD Administrator shall review the appeal, meet with the appellant if the CFD Administrator deems necessary, and advise the appellant of its determination.

If the property owner disagrees with the CFD Administrator's decision relative to the appeal, the owner may then file a written appeal with the City Council whose subsequent decision shall be final and binding on all interested parties. If the decision of the CFD Administrator or subsequent decision by the City Council requires the Special Tax to be modified or changed in favor of the property owner, then the CFD Administrator shall determine if sufficient Special Tax revenue is available to make a cash refund. If a cash refund cannot be made, then an adjustment shall be made to credit future Special Tax levy(ies).

This procedure shall be exclusive and its exhaustion by any property owner shall be a condition precedent to filing any legal action by such owner.

G. MANNER OF COLLECTION

The Special Tax shall be collected in the same manner and at the same time as ordinary *ad valorem* property taxes; provided, however, that the Special Taxes may be collected in such other manner as the City Council shall determine, including direct billing of affected property owners.

H. PREPAYMENT OF SPECIAL TAX

The following definitions apply to this Section H:

"CFD Public Facilities" means $12,110,000 each Prepayment Period, or such lower number as determined by the City Council to be sufficient to fund the Facilities and Services to be provided by CFD No. 35.

"Expenditures Fund" means funds or accounts, regardless of their names, that are established to hold moneys that are available to acquire or construct Facilities and to fund Services.

"Future Facilities Costs" means the CFD Public Facilities minus (i) Facilities and Services costs previously paid from the Expenditures Fund during the Prepayment Period in which the prepayment is being made, (ii) moneys currently on deposit in the Expenditures Fund from deposits made during the Prepayment Period in which the prepayment is being made, and (iii) moneys currently on deposit in an escrow fund that are expected to be available to finance Facilities costs. In no event shall the amount of Future Facilities Costs be less than zero.

"Prepayment Period" means one of three periods of time during which a Special Tax prepayment may be made.

"Prepayment Period 1" means July 1, 2018, through June 30, 2052.

"Prepayment Period 2" means July 1, 2052, through June 30, 2085.

"Prepayment Period 3" means July 1, 2085, through June 30, 2119.

1. Prepayment in Full

The obligation of an Assessor's Parcel to pay the Special Tax may be prepaid as described herein, provided that a prepayment may be made only for Assessor's Parcels for which a building permit for new construction was issued after January 1, 2017, and only if there are no delinquent Special Taxes with respect to such Assessor's Parcel at the time of prepayment. An owner of an Assessor's Parcel intending to prepay the Special Tax obligation shall provide the CFD Administrator with written notice of intent to prepay. Within 30 days of receipt of such written notice, the CFD Administrator shall notify such owner of the prepayment amount for such Assessor's Parcel. The CFD Administrator may charge a fee for providing this service. Prepayment in any six month period must be made not less than 45 days prior to the next occurring date that notice of redemption of Bonds from the proceeds of such prepayment may be given to the Trustee pursuant to the Indenture.

The Special Tax Prepayment Amount (defined below) shall be calculated as summarized below (capitalized terms as defined below):

Bond Redemption Amount	
plus	Redemption Premium
plus	Future Facilities Amount
plus	Defeasance Amount
plus	Administrative Fees and Expenses
less	Reserve Fund Credit
Total	Prepayment Amount

As of the proposed date of prepayment, the Special Tax Prepayment Amount (defined below) shall be calculated by the CFD Administrator as follows:

Paragraph No.

1. Confirm that no Special Tax delinquencies apply to such Assessor's Parcel, and determine the Prepayment Period for the proposed prepayment.

2. Compute the Assigned Special Tax and Backup Special Tax for the Assessor's Parcel to be prepaid based on the Developed Property Special Tax which is, or could be, charged in the current Fiscal Year. For Assessor's Parcels of Final Mapped Property (for which a building permit has been issued but which is not yet classified as Developed Property) to be prepaid, compute the Assigned Special Tax and Backup Special Tax for that Assessor's Parcel as though it was already designated as Developed Property, based upon the building permit which has already been issued for that Assessor's Parcel.

3. (a) Divide the Assigned Special Tax computed pursuant to Paragraph 2 by the total estimated Assigned Special Tax for CFD No. 35 based on the Developed Property Special Tax which could be charged in the current Fiscal Year on all expected development through buildout of CFD No. 35, excluding any Assessor's Parcels which have been prepaid, and

   (b) Divide the Backup Special Tax computed pursuant to Paragraph 2 by the estimated total Backup Special Tax at buildout of CFD No. 35, excluding any Assessor's Parcels which have been prepaid.

4. Multiply the larger quotient computed pursuant to Paragraph 3(a) or 3(b) by the Outstanding Bonds to compute the amount of Outstanding Bonds to be retired and prepaid (the "Bond Redemption Amount").

5. Multiply the Bond Redemption Amount computed pursuant to Paragraph 4 by the applicable redemption premium (e.g., the redemption price minus 100%), if any, on the Outstanding Bonds to be redeemed (the "Redemption Premium").

6. Compute the Future Facilities Costs for the applicable Prepayment Period.

7. Multiply the larger quotient computed pursuant to Paragraph 3(a) or 3(b) by the amount determined pursuant to Paragraph 6 to compute the amount of Future Facilities Costs to be prepaid (the "Future Facilities Amount").

8. Compute the amount needed to pay interest on the Bond Redemption Amount from the first bond interest and/or principal payment date following the current Fiscal Year until the earliest redemption date for the Outstanding Bonds.

9. Determine the Special Tax levied on the Assessor's Parcel in the current Fiscal Year which has not yet been paid.

10. Add the amounts computed pursuant to Paragraphs 8 and 9 to determine the "Defeasance Amount".

11. Verify the administrative fees and expenses of CFD No. 35, including the costs to compute the prepayment, the costs to invest the prepayment proceeds, the costs to redeem Bonds, and the costs to record any notices to evidence the prepayment and the redemption (the "Administrative Fees and Expenses").

12. If reserve funds for the Outstanding Bonds, if any, are at or above 100% of the reserve requirement (as defined in the Indenture) on the prepayment date, a reserve fund credit shall be calculated as a reduction in the applicable reserve fund for the Outstanding Bonds to be redeemed pursuant to the prepayment (the "Reserve Fund Credit"). No Reserve Fund Credit shall be granted if reserve funds are below 100% of the reserve requirement on the prepayment date or the redemption date.

13. The Special Tax prepayment is equal to the sum of the amounts computed pursuant to Paragraphs 4, 5, 7, 10, and 11, less the amount computed pursuant to Paragraph 12 (the "Prepayment Amount").

14. From the Prepayment Amount, the amounts computed pursuant to Paragraphs 4, 5, 10, and 12 shall be deposited into the appropriate fund as established under the Indenture and be used to retire Outstanding Bonds or make debt service payments. The amount computed pursuant to Paragraph 7 shall be deposited into the Expenditures Fund. The amount computed pursuant to Paragraph 11 shall be retained by CFD No. 35.

The Special Tax Prepayment Amount may be sufficient to redeem other than a $5,000 increment of Bonds. In such cases, the increment above $5,000, or integral multiple thereof, will be retained in the appropriate fund established under the Indenture to be used with the next prepayment of Bonds or to make debt service payments.

As a result of the payment of the current Fiscal Year's Special Tax levy as determined under Paragraph 9 (above), the CFD Administrator shall remove the current Fiscal Year's Special Tax levy for such Assessor's Parcel from the County tax rolls. With respect to any Assessor's Parcel that is prepaid during Prepayment Period 3, the CFD Administrator shall cause a suitable notice to be recorded in compliance with the Act to indicate that the Special Tax has been prepaid and that the obligation of such Assessor's Parcel to pay the Special Tax shall cease.

With respect to the Special Tax for any Assessor's Parcel that is prepaid during Prepayment Period 1 or Prepayment Period 2, the obligation of such Assessor's Parcel to pay the Special Tax shall be tolled, or suspended, through the end of such Prepayment Period, but shall resume in the first Fiscal Year of the subsequent Prepayment Period. The CFD Administrator shall cause a suitable notice to be recorded in compliance with the Act to indicate that the Special Tax has been satisfied for the remainder of the applicable Prepayment Period but has not been permanently satisfied and the obligation

to pay the Special Tax will resume in the first Fiscal Year of the Prepayment Period following the Prepayment Period in which the prepayment was made. Once the obligation of an Assessor's Parcel to pay the Special Tax resumes, the Special Tax for the then applicable Prepayment Period may be prepaid.

Notwithstanding the foregoing, no Special Tax prepayment shall be allowed unless the amount of Maximum Special Tax that may be levied on Taxable Property within CFD No. 35 (after excluding 2.44 Acres of Public Property and 14.12 acres of Property Owner Association Property) both prior to and after the proposed prepayment is at least 1.1 times the maximum annual debt service on all Outstanding Bonds.

2. Prepayment in Part

The Special Tax on an Assessor's Parcel for which a building permit for new construction was issued after January 1, 2017, may be partially prepaid. The amount of the prepayment shall be calculated as in Section H.1, except that a partial prepayment shall be calculated by the CFD Administrator according to the following formula:

$$PP = (PF - AE) \times \% + AE.$$

The terms above have the following meaning:

PP = the partial prepayment
PF = the Prepayment Amount (full prepayment) for the Special Tax calculated according to Section H.1
AE = the Administrative Fees and Expenses determined pursuant to paragraph 11 above
% = the percentage by which the owner of the Assessor's Parcel(s) is partially prepaying the Special Tax

The Special Tax partial prepayment amount must be sufficient to redeem at least a $5,000 increment of Bonds.

The owner of any Assessor's Parcel who desires such prepayment shall notify the CFD Administrator of such owner's intent to partially prepay the Special Tax and the percentage by which the Special Tax shall be prepaid. The CFD Administrator shall provide the owner with a statement of the amount required for the partial prepayment of the Special Tax for an Assessor's Parcel within thirty (30) days of the request and may charge a fee for providing this service. With respect to any Assessor's Parcel that is partially prepaid, the CFD Administrator shall (i) distribute the remitted prepayment funds according to Section H.1, and (ii) indicate in the records of CFD No. 35 that there has been a partial prepayment of the Special Tax and that a portion of the Special Tax with respect to such Assessor's Parcel, equal to the outstanding percentage (100% - "%", as defined above) of the Maximum Special Tax, shall continue to be levied on such Assessor's Parcel pursuant to Section D during the Prepayment Period in which the partial prepayment is made.

For partial prepayments made during Prepayment Period 1 or Prepayment Period 2, the full amount of the Special Tax shall resume in the first Fiscal Year of the Prepayment

Period following the Prepayment Period in which the partial prepayment was made. Once the obligation of an Assessor's Parcel to pay the Special Tax resumes, the Special Tax for the then applicable Prepayment Period may be prepaid.

I. TERM OF SPECIAL TAX

The Fiscal Year after which no further Special Tax shall be levied or collected is Fiscal Year 2118-2119, except that the Special Tax that was lawfully levied in or before such Fiscal Year and that remains delinquent may be collected in subsequent years.

EXHIBIT A

CERTIFICATE OF MODIFICATION OF SPECIAL TAX
(PAGE 1 OF 2)

CITY OF ONTARIO AND CFD NO. 35 CERTIFICATE

1. Pursuant to Section C.1 of the Amended and Restated Rate and Method of Apportionment of Special Tax (the "Rate and Method") for City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South – Facilities) ("CFD No. 35"), the Assigned Special Tax and the Backup Special Tax for Developed Property within CFD No. 35 has been modified.

    a. The information in Table 1 relating to the Assigned Special Tax for Developed Property within CFD No. 35, as stated in Section C.1.a.2 of the Rate and Method of Apportionment, has been modified as follows:

TABLE 1
ASSIGNED SPECIAL TAX – DEVELOPED PROPERTY

Land Use Class	Description	Residential Floor Area (Square Footage)	Assigned Special Tax
1	Single Family Property	< 1,501	$[ ] per Unit
2	Single Family Property	1,501 – 1,700	$[ ] per Unit
3	Single Family Property	1,701 – 1,900	$[ ] per Unit
4	Single Family Property	1,901 – 2,100	$[ ] per Unit
5	Single Family Property	2,101 – 2,300	$[ ] per Unit
6	Single Family Property	2,301 – 2,500	$[ ] per Unit
7	Single Family Property	> 2,500	$[ ] per Unit
8	Other Residential Property		$[ ] per Acre
9	Non-Residential Property		$[ ] per Acre

EXHIBIT A

CERTIFICATE OF MODIFICATION OF SPECIAL TAX
(PAGE 2 OF 2)

b. The Backup Special Tax for Developed Property, as stated in Section C.1.a.3, shall be modified as follows:

The Backup Special Tax shall be $[____] per Unit for Single Family Property. However, if the Expected Residential Lot Count does not equal 235 for Single Family Property, and the City has not issued Bonds, then the Backup Special Tax for Designated Buildable Lots of Single Family Property shall be calculated according to the following formula:

Backup Special Tax = $[_____] ÷ Expected Residential Lot Count for Single Family Property

2. The Special Tax for Developed Property may only be modified prior to the first issuance of CFD No. 35 Bonds.

3. Upon execution of this Certificate by CFD No. 35, CFD No. 35 shall cause an amended notice of Special Tax lien for CFD No. 35 to be recorded reflecting the modifications set forth herein.

Capitalized undefined terms used herein have the meanings ascribed thereto in the Rate and Method. The modifications set forth in this Certificate have been calculated by the CFD Administrator in accordance with the Rate and Method.

GOODWIN CONSULTING GROUP, INC.
CFD ADMINISTRATOR

By:_____ Date:_____

The undersigned acknowledges receipt of this Certificate and of the modification of the Assigned Special Tax and the Backup Special Tax for Developed Property as set forth in this Certificate.

CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 35
(COUNTRYSIDE PHASE 2 SOUTH – FACILITIES)

By:_____ Date:_____

RESOLUTION NO. _____

A RESOLUTION OF CHANGE OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, DECLARING RESULTS OF A SPECIAL ELECTION, DETERMINING THAT CHANGES TO THE RATE AND METHOD OF APPORTIONMENT OF THE EXISTING SPECIAL TAX OF CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH - FACILITIES) ARE LAWFULLY AUTHORIZED AND DIRECTING RECORDING OF AN AMENDMENT TO NOTICE OF SPECIAL TAX LIEN.

WHEREAS, the City Council (the "City Council") of the City of Ontario (the "City") previously established City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities) (the "Community Facilities District") pursuant to the Mello-Roos Community Facilities Act of 1982 (the "Act"); and

WHEREAS, on April 19, 2022, the City Council, pursuant to the Act, adopted a resolution entitled "A Resolution of the City Council of the City of Ontario, California, Calling a Special Election for Proposed Changes to the Rate and Method of Apportionment of the Existing Special Tax of City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities)" (the "Resolution Calling Election"), calling a special election of the qualified electors within the Community Facilities District and submitting to such qualified electors the proposition to change the rate and method of apportionment of the special tax (the "Special Tax") levied within the Community Facilities District so as to increase certain of the Special Tax rates thereunder; and

WHEREAS, pursuant to the terms of the Resolution Calling Election and the provisions of the Act, the special election was held on April 19, 2022; and

WHEREAS, the City Clerk of the City (the "City Clerk") has certified the canvass of the returns of the election and has filed a Canvass and Statement of Results of Election (the "Canvass"), a copy of which is attached hereto as Exhibit A; and

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Ontario as follows:

SECTION 1. The foregoing recitals are true and correct, and the City Council so finds and determines.

SECTION 2. The City Council has received, reviewed and hereby accepts the Canvass.

SECTION 3. The City Council hereby finds and declares that the ballot proposition submitted to the qualified electors of the Community Facilities District pursuant to the Resolution Calling Election has been passed and approved by such electors in accordance with Section 53338 of the Act.

SECTION 4. The City Council hereby finds and determines that the changes to the rate and method of apportionment of the Special Tax so as to increase certain of the Special tax rates thereunder, as described in the Resolution Calling Election, are lawfully authorized.

SECTION 5. The City Clerk is hereby directed to execute and cause to be recorded in the office of the County Recorder of the County of San Bernardino an amendment to the notice of special tax lien for the Community Facilities District in accordance with Section 3117.5 of the California Streets and Highways Code.

SECTION 6. All actions heretofore taken by the officers, employees and agents of the City with respect to the changes to the rate and method of apportionment of the Special Tax, or in connection with or related to any of the documents referred to herein, are hereby approved, confirmed and ratified.

SECTION 7. The officers, employees and agents of the City are hereby authorized and directed to take all actions and do all things that they, or any of them, may deem necessary or desirable to accomplish the purposes of this Resolution and not inconsistent with the provisions hereof.

SECTION 8. This Resolution shall take effect immediately upon its adoption.

The City Clerk of the City of Ontario shall certify as to the adoption of this Resolution.

PASSED, APPROVED, AND ADOPTED this 19th day of April 2022.

_____
PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO FORM:

_____
BEST BEST & KRIEGER, LLP
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. 2022- was duly passed and adopted by the City Council of the City of Ontario at their regular meeting held April 19, 2022 by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

The foregoing is the original of Resolution No. 2022- duly passed and adopted by the Ontario City Council at their regular meeting held April 19, 2022.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

EXHIBIT A

CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 35
(COUNTRYSIDE PHASE 2 SOUTH - FACILITIES)

CANVASS AND STATEMENT OF RESULTS OF ELECTION

I hereby certify that on April 19, 2022, I canvassed the returns of the special election held on April 19, 2022 for the City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities), that the total number of ballots cast in said Community Facilities District and the total number of votes cast for and against the proposition are as follows and that the totals as shown for and against the proposition are true and correct:

	Qualified Landowner Votes	Votes Cast	YES	NO
City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities) Special Election, April 19, 2022	35	___	___	___

MEASURE SUBMITTED TO VOTE OF VOTERS: Shall the rate and method of apportionment of the special tax levied within City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities) (the "Community Facilities District") be changed so as to increase certain of the special tax rates thereunder, all as specified in the Resolution entitled "A Resolution of the City Council of the City of Ontario, California, Calling a Special Election for Proposed Changes to the Rate and Method of Apportionment of the Existing Special Tax of City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities)," adopted by the City Council of the City of Ontario on April 19, 2022?

IN WITNESS WHEREOF, I HAVE HEREUNTO SET MY HAND this 19th day of April 2022.

BY: _____
SHEILA MAUTZ, CITY CLERK

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, AMENDING AND RESTATING ORDINANCE NO. 3082 LEVYING SPECIAL TAXES WITHIN THE CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH - FACILITIES).

WHEREAS, the City Council (the "City Council") of the City of Ontario (the "City") previously established City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities) (the "Community Facilities District") pursuant to the Mello-Roos Community Facilities Act of 1982 (the "Act");

WHEREAS, the qualified electors of the Community Facilities District authorized the levy of a special tax (the "Special Tax") within the Community Facilities District to pay, in whole or in part, the cost of providing certain facilities (the "Facilities") and certain services (the "Services") and incidental expenses pursuant to the Act referenced in the proposition submitted to such qualified electors;

WHEREAS, pursuant to Section 53340 of the Act, the City Council, on November 7, 2017, adopted Ordinance No. 3082, entitled "An Ordinance of the City Council of the City of Ontario, California, Levying Special Taxes within the City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities)" (the "Levy Ordinance"), levying the Special Tax at the rate and in accordance with the method of apportionment referenced therein (the "Original Rate and Method");

WHEREAS, on March 15, 2022, the City Council adopted a resolution entitled "A Resolution of the City Council of the City of Ontario, California, of Consideration to Change the Rate and Method of Apportionment of the Existing Special Tax of City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities)" proposing changes to the Original Rate and Method so as to increase certain of the Special Tax rates thereunder;

WHEREAS, on April 19, 2022, the City Council, pursuant to the Act, adopted a resolution entitled "A Resolution of the City Council of the City of Ontario, California, Calling a Special Election for Proposed Changes to the Rate and Method of Apportionment of the Existing Special Tax of City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities)" (the "Resolution Calling Election") calling for a special election of the qualified electors within the Community Facilities District and submitting to such qualified electors the proposition to change the Original Rate and Method so as to increase certain of the Special Tax rates thereunder, as reflected in the City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities) Amended and Restated Rate and Method of Apportionment of Special Tax (the "Restated Rate and Method") attached thereto and incorporated therein;

WHEREAS, on April 19, 2022, the City Council adopted a resolution entitled "A Resolution of the City Council of the City of Ontario, California, Declaring Results of a Special Election, Determining That Changes to the Rate and Method of Apportionment of

the Existing Special Tax of City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities) Are Lawfully Authorized and Directing Recording of an Amendment to Notice of Special Tax Lien," declaring that the ballot proposition submitted to the qualified electors of the Community Facilities District pursuant to the Resolution Calling Election has been passed and approved by such electors and finding and determining that that the changes to the Original Rate and Method, as reflected in the Restated Rate and Method, were lawfully authorized; and

WHEREAS, this Ordinance amends and restates the Levy Ordinance in order to reflect such changes;

THE CITY COUNCIL OF THE CITY OF ONTARIO DOES ORDAIN AS FOLLOWS:

SECTION 1. The Levy Ordinance is hereby amended and restated to read in full as set forth herein.

SECTION 2. The City Council hereby authorizes and levies the Special Tax within the Community Facilities District pursuant to Sections 53328 and 53340 of the Act, at the rate and in accordance with the method of apportionment set forth in the Restated Rate and Method. The Special Tax is hereby levied in each fiscal year until the last fiscal year in which the Special Tax is authorized to be levied pursuant to the Restated Rate and Method.

SECTION 3. The City Council may, in accordance with subdivision (b) of Section 53340 of the Act, provide, by resolution, for the levy of the Special Tax in future tax years at the same rate or at a lower rate than the rate provided by this Ordinance. In no event shall the Special Tax be levied on any parcel within the Community Facilities District in excess of the maximum tax specified therefor in the Restated Rate and Method.

SECTION 4. The Special Tax shall be levied on all of the parcels in the Community Facilities District, unless exempted by law or by the Restated Rate and Method.

SECTION 5. The proceeds of the Special Tax shall only be used to pay, in whole or in part, the cost of providing the Facilities and Services and incidental expenses pursuant to the Act.

SECTION 6. The Special Tax shall be collected in the same manner as ordinary *ad valorem* property taxes are collected and shall be subject to the same penalties and the same procedure, sale and lien priority in the case of delinquency as is provided for *ad valorem* taxes, unless another procedure is adopted by the City Council.

SECTION 7. If for any reason any portion of this Ordinance is found to be invalid, or if the Special Tax is found inapplicable to any particular parcel within the Community Facilities District, by a court of competent jurisdiction, the balance of this Ordinance and the application of the Special Tax to the remaining parcels within the Community Facilities District shall not be affected.

SECTION 8. The Mayor shall sign this Ordinance and the City Clerk shall certify as to the adoption and shall cause a summary hereof to be published at least once in a newspaper of general circulation in the City of Ontario, California within fifteen (15) days of the adoption. The City Clerk shall post a certified copy of this Ordinance, including the vote for and against the same, in the Office of the City Clerk, in accordance with California Government Code Section 36933.

The City Clerk of the City of Ontario shall certify as to the adoption of this Ordinance.

PASSED, APPROVED, AND ADOPTED this _____ day of _____ 2022.

_____
PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO FORM:

_____
BEST BEST & KRIEGER LLP
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Ordinance No. _____ was duly introduced at a regular meeting of the City Council of the City of Ontario held _____ and adopted at the regular meeting held _____, 2022 by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

I hereby certify that the foregoing is the original of Ordinance No. _____ duly passed and adopted by the Ontario City Council at their regular meeting held _____ and that Summaries of the Ordinance were published on _____ and _____, in the Inland Valley Daily Bulletin newspaper.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, DEEMING IT NECESSARY TO AMEND RESOLUTION NO. 2017-124 IN ORDER TO INCREASE THE MAXIMUM AGGREGATE AMOUNT OF BONDED INDEBTEDNESS THAT CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH - FACILITIES) IS AUTHORIZED TO INCUR.

WHEREAS, on October 17, 2017, the City Council (the "City Council") of the City of Ontario (the "City"), pursuant to the Mello-Roos Community Facilities Act of 1982 (the "Act"), adopted Resolution No. 2017-123, entitled "A Resolution of the City Council of the City of Ontario, California, of Formation of the City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities), Authorizing the Levy of a Special Tax within the Community Facilities District and Establishing an Appropriations Limit for the Community Facilities District," Resolution No. 2017-124, entitled "A Resolution of the City Council of the City of Ontario, California, Deeming it Necessary to Incur Bonded Indebtedness within the City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities)" (the "Resolution Deeming it Necessary to Incur"), and Resolution No. 2017-125, entitled "A Resolution of the City Council of the City of Ontario, California, Calling Special Election for City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities)," which resolutions established City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities) (the "Community Facilities District"), authorized the levy of a special tax within the Community Facilities District and called an election within the Community Facilities District on the proposition of incurring indebtedness, levying a special tax and establishing an appropriations limit for the Community Facilities District, respectively, for the purpose of financing certain public facilities and services, as further provided in the Resolution of Formation; and

WHEREAS, on October 17, 2017, an election was held in which the qualified electors of the Community Facilities District approved said proposition by more than the two-thirds vote required by the Act; and

WHEREAS, pursuant to the Resolution Deeming it Necessary to Incur and said election, the Community Facilities District is authorized to incur bonded indebtedness in a maximum aggregate amount of not to exceed $27,000,000; and

WHEREAS, on March 15, 2022, the City Council, pursuant to the Act, adopted a Resolution entitled "A Resolution of the City Council of the City Of Ontario, California, of Intention to Amend Resolution No. 2017-124 In Order to Increase the Maximum Aggregate Amount of Bonded Indebtedness that City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities) is Authorized to Incur" (the "Resolution of Intention"), declaring the necessity to increase the maximum aggregate amount of bonded indebtedness that the Community Facilities District is authorized to incur from $27,000,000 to $42,000,000 and setting the date for a public hearing to be held on the proposed increase in the maximum aggregate amount of bonded indebtedness that the Community Facilities District is authorized to incur; and

WHEREAS, pursuant to the Resolution of Intention, notice of said public hearing was published in the *Inland Valley Daily Bulletin*, a newspaper of general circulation published in the area of the Community Facilities District, in accordance with the Act; and

WHEREAS, on this date, the City Council opened, conducted and closed said public hearing; and

WHEREAS, at said public hearing, any person interested, including persons owning property within the Community Facilities District and desiring to appear and present any matters material to the questions set forth in the Resolution of Intention appeared and presented such matters; and

WHEREAS, oral or written protests against the proposed increase in the maximum aggregate amount of bonded indebtedness that the Community Facilities District is authorized to incur were not made or filed at or before said public hearing by 50% or more of the registered voters, or six registered voters, whichever is more, residing within the territory of the Community Facilities District, or the owners of one-half or more of the area of land in the territory of the Community Facilities District and not exempt from the special tax; and

WHEREAS, there has been filed with the City Clerk of the City a letter from the Registrar of Voters of the County of San Bernardino indicating that no persons were registered to vote within the territory of the Community Facilities District as of March 17, 2022, and, accordingly, that 12 or more persons have not been registered to vote within the territory of the Community Facilities District for each of the 90 days preceding the close of said public hearing.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Ontario as follows:

SECTION 1. The foregoing recitals are true and correct, and the City Council so finds and determines.

SECTION 2. The City Council deems it is necessary that the maximum aggregate amount of bonded indebtedness that the Community Facilities District is authorized to incur be increased from $27,000,000 to $42,000,000.

SECTION 3. In order to increase the maximum aggregate amount of bonded indebtedness that the Community Facilities District is authorized to incur from $27,000,000 to $42,000,000, Section 5 of the Resolution Deeming it Necessary to Incur shall be amended to read in full as follows:

> "SECTION 5. The maximum aggregate amount of debt to be incurred is $42,000,000."

SECTION 4. Pursuant to the provisions of the Act, the proposal to increase the maximum aggregate amount of bonded indebtedness that the Community Facilities District is authorized to incur from $27,000,000 to $42,000,000 by amending Section 5 of

the Resolution Deeming it Necessary to Incur shall be subject to the approval of the qualified electors of the Community Facilities District at a special election. The City Council hereby finds and determines that no persons were registered to vote within the territory of the Community Facilities District as of March 17, 2022, and that 12 or more persons have not been registered to vote within the territory of the Community Facilities District for each of the 90 days preceding the close of the public hearing held by the City Council on the proposed increase in the maximum aggregate amount of bonded indebtedness that the Community Facilities District is authorized to incur. Accordingly, pursuant to Section 53326 of the Act, the vote shall be by the landowners of the Community Facilities District and each person who is the owner of land as of the close of said public hearing, or the authorized representative thereof, shall have one vote for each acre or portion of an acre that he or she owns within the Community Facilities District not exempt from the special tax. The voting procedure shall be by mailed or hand-delivered ballot.

SECTION 5. The date of the special community facilities district election at which time the proposition shall be submitted to the voters is April 19, 2022.

SECTION 6. The election is to be conducted by mail ballot. The mailed ballots are required to be received in the office of the City Clerk no later than 7:30 p.m. on April 19, 2022; provided, however, that if all of the qualified electors have voted prior to such time, the election may be closed with the concurrence of the City Clerk.

SECTION 7. All actions heretofore taken by the officers, employees and agents of the City with respect to the proposed increase in the maximum aggregate amount of bonded indebtedness that the Community Facilities District is authorized to incur, or in connection with or related to any of the documents referred to herein, are hereby approved, confirmed and ratified.

SECTION 8. The officers, employees and agents of the City are hereby authorized and directed to take all actions and do all things which they, or any of them, may deem necessary or desirable to accomplish the purposes of this Resolution and not inconsistent with the provisions hereof.

SECTION 9. This Resolution shall take effect immediately upon its adoption.

PASSED, APPROVED, AND ADOPTED this 19th day of April 2022.

_____

PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO FORM:

_____
BEST BEST & KRIEGER, LLP
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. 2022- was duly passed and adopted by the City Council of the City of Ontario at their regular meeting held April 19, 2022 by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

The foregoing is the original of Resolution No. 2022- duly passed and adopted by the Ontario City Council at their regular meeting held April 19, 2022.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, CALLING SPECIAL ELECTION FOR CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH - FACILITIES).

WHEREAS, on this date, the City Council (the "City Council") of the City of Ontario (the "City"), pursuant to the Mello-Roos Community Facilities Act of 1982 (the "Act"), adopted a resolution entitled "A Resolution of the City Council of the City of Ontario, California, Deeming it Necessary to Amend Resolution No. 2017-124 In Order to Increase the Maximum Aggregate Amount of Bonded Indebtedness that City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities) is Authorized to Incur" (the "Resolution Deeming it Necessary "), deeming it necessary that the maximum aggregate amount of bonded indebtedness that City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities) (the "Community Facilities District") is authorized to incur be increased from $27,000,000 to $42,000,000; and

WHEREAS, pursuant to the provisions of said resolution, the proposition to increase the maximum aggregate amount of bonded indebtedness the Community Facilities District is authorized to incur is to be submitted to the qualified electors of the Community Facilities District as required by the Act; and

WHEREAS, the City Council desires to designate the City Clerk of the City (the "City Clerk") as the election official for the special election provided for herein; and

WHEREAS, there has been filed with the City Clerk a letter from the Registrar of Voters of the County of San Bernardino indicating that no persons were registered to vote within the territory of the Community Facilities District as of March 17, 2022, and, accordingly, that 12 or more persons have not been registered to vote within the territory of the Community Facilities District for each of the 90 days preceding the close of the public hearing on the proposed increase in the maximum aggregate amount of bonded indebtedness that the Community Facilities District is authorized to incur; and

WHEREAS, there has been filed with the City Clerk consents and waivers of all of the landowners of record in the Community Facilities District waiving any time limit specified by Section 53326 of the Act and any requirement pertaining to the conduct of said special election, including any time limit or requirement applicable to an election pursuant to Article 5 of the Act (commencing with Section 53345 of the Act), consenting to the holding of said special election on April 19, 2022 and waiving any impartial analysis, arguments or rebuttals, as set forth in Sections 53326 and 53327 of the Act; and

WHEREAS, the City Clerk has concurred in said waivers and has concurred in holding said special election on April 19, 2022.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Ontario as follows:

SECTION 1. The foregoing recitals are true and correct.

SECTION 2. Pursuant to the Act, the proposition to increase the maximum aggregate amount of bonded indebtedness that the Community Facilities District is authorized to incur shall be submitted to the qualified electors of the Community Facilities District at an election called therefor as provided below.

SECTION 3. The City Clerk is hereby designated as the official to conduct said election.

SECTION 4. The City Council hereby finds and determines that no persons were registered to vote within the territory of the Community Facilities District as of March 17, 2022, and that 12 or more persons have not been registered to vote within the territory of the Community Facilities District for each of the 90 days preceding the close of the public hearing heretofore held by the City Council on the proposed increase in the maximum aggregate amount of bonded indebtedness that the Community Facilities District is authorized to incur. Accordingly, pursuant to Section 53326 of the Act, the vote shall be by the landowners of the Community Facilities District and each person who is the owner of land as of the close of said public hearing, or the authorized representative thereof, shall have one vote for each acre or portion of an acre that he or she owns within the Community Facilities District not exempt from the special tax.

SECTION 5. The City Council hereby finds and determines that the qualified electors of the Community Facilities District have unanimously consented (a) to the waiver of any time limit specified by Section 53326 of the Act and any requirement pertaining to the conduct of said election, including any time limit or requirement applicable to an election pursuant to Article 5 of the Act (commencing with Section 53345 of the Act), (b) to the holding of said election on April 19, 2022, and (c) to the waiver of any impartial analysis, arguments or rebuttals, as set forth in Sections 53326 and 53327 of the Act. The City Council herby finds and determines that the City Clerk has concurred in said waivers and has concurred in holding said election on April 19, 2022.

SECTION 6. The City Council hereby calls a special election to increase the maximum aggregate amount of bonded indebtedness that the Community Facilities District is authorized to incur from $27,000,000 to $42,000,000, which election shall be held at 303 East B Street, Ontario, California, on April 19, 2022. The City Council has caused to be provided to the City Clerk, as the official to conduct said election, the Resolution of Deeming it Necessary, a certified map of sufficient scale and clarity to show the boundaries of the Community Facilities District, and a sufficient description to allow the City Clerk to determine the boundaries of the Community Facilities District.

The voted ballots shall be returned to the City Clerk not later than 7:30 p.m. on April 19, 2022; provided, however, that if all of the qualified electors have voted prior to such time, the election may be closed with the concurrence of the City Clerk.

SECTION 7. Pursuant to Section 53326 of the Act, the election shall be conducted by mail or hand-delivered ballot pursuant to Section 4000 *et. seq.* of the California Elections Code. Except as otherwise provided in the Act, the provisions of law regulating elections of the City, insofar as they may be applicable, will govern the election.

SECTION 8. The form of the ballot for said election is attached hereto as Exhibit A and by this reference incorporated herein, and such form of ballot is hereby approved. The City Clerk shall cause to be delivered to each of the qualified electors of the Community Facilities District a ballot in said form. Each ballot shall indicate the number of votes to be voted by the respective landowner to which it pertains.

Each ballot shall be accompanied by all supplies and written instructions necessary for the use and return of the ballot. The identification envelope for return of the ballot shall be enclosed with the ballot, shall have the return postage prepaid, and shall contain: (a) the name and address of the landowner, (b) a declaration, under penalty of perjury, stating that the voter is the owner of record or the authorized representative of the landowner entitled to vote and is the person whose name appears on the identification envelope, (c) the printed name, signature and address of the voter, (d) the date of signing and place of execution of the declaration described in clause (b) above, and (e) a notice that the envelope contains an official ballot and is to be opened only by the canvassing board.

Analysis and arguments with respect to the ballot proposition are hereby waived, as provided in Section 53327 of the Act.

SECTION 9. The City Clerk shall accept the ballots of the qualified electors in the office of the City Clerk at 303 East B Street, Ontario, California, to and including 7:30 p.m. on April 19, 2022, whether said ballots be personally delivered or received by mail. The City Clerk shall have available ballots which may be marked at said location on the election day by said qualified electors.

SECTION 10. All actions heretofore taken by the officers, employees and agents of the City with respect to the special election called for herein, or in connection with or related to any of the matters referred to herein, are hereby approved, confirmed and ratified.

SECTION 11. The officers, employees and agents of the City are hereby authorized and directed to take all actions and do all things which they, or any of them, may deem necessary or desirable to accomplish the purposes of this Resolution and not inconsistent with the provisions hereof.

SECTION 12. This Resolution shall take effect immediately upon its adoption.

The City Clerk of the City of Ontario shall certify as to the adoption of this Resolution.

PASSED, APPROVED, AND ADOPTED this 19th day of April 2022.

_____
PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO FORM:

_____
BEST BEST & KRIEGER, LLP
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. 2022- was duly passed and adopted by the City Council of the City of Ontario at their regular meeting held April 19, 2022 by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

The foregoing is the original of Resolution No. 2022- duly passed and adopted by the Ontario City Council at their regular meeting held April 19, 2022.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

EXHIBIT A

OFFICIAL BALLOT

CITY OF ONTARIO
April 19, 2022

SPECIAL ELECTION

This ballot is for a special, landowner election. The number of votes to be voted pursuant to this ballot is ____.

INSTRUCTIONS TO VOTERS:

To vote on the measure, mark a cross (+ or X) in the voting square after the word "YES" or after the word "NO". All distinguishing marks or erasures are forbidden and make the ballot void. If you wrongly mark, tear, or deface this ballot, return it to the City Clerk of the City of Ontario and obtain another.

CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 35
(COUNTRYSIDE PHASE 2 SOUTH - FACILITIES)

MEASURE SUBMITTED TO VOTE OF VOTERS: Shall the maximum aggregate amount of bonded indebtedness that City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities) (the "Community Facilities District") is authorized to incur be increase from $27,000,000 to $42,000,000, as specified in the Resolution entitled "A Resolution of the City Council of the City of Ontario, California, Deeming it Necessary to Amend Resolution No. 2017-124 In Order to Increase the Maximum Aggregate Amount of Bonded Indebtedness that City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities) is Authorized to Incur," adopted by the City Council of the City of Ontario on April 19, 2022?

Yes: ☐

No: ☐

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, DECLARING RESULTS OF SPECIAL ELECTION OF COMMUNITY FACILITIES DISTRICT NO. 35 (COUNTRYSIDE PHASE 2 SOUTH-FACILITIES).

WHEREAS, on April 19, 2022, the City Council (the "City Council") of the City of Ontario (the "City"), pursuant to the Mello-Roos Community Facilities Act of 1982 (the "Act"), adopted a resolution entitled "A Resolution of the City Council of the City of Ontario, California, Calling Special Election for City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities)" (the "Resolution Calling Election"), calling for a special election of the qualified electors within City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities) (the "Community Facilities District"); and

WHEREAS, pursuant to the terms of the Resolution Calling Election and the provisions of the Act, the special election was held on April 19, 2022; and

WHEREAS, the City Clerk of the City (the "City Clerk") has certified the canvass of the returns of the election and has filed a Canvass and Statement of Results of Election (the "Canvass"), a copy of which is attached hereto as Exhibit A;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Ontario as follows:

SECTION 1. The foregoing recitals are true and correct.

SECTION 2. The City Council has received, reviewed and hereby accepts the Canvass.

SECTION 3. The City Council hereby finds and declares that the ballot proposition submitted to the qualified electors of the Community Facilities District pursuant to the Resolution Calling Election has been passed and approved by such electors in accordance with Section 53355 of the Act.

SECTION 4. All actions heretofore taken by the officers, employees and agents of the City with respect to the special election, or in connection with or related to any of the matters referred to herein, are hereby approved, confirmed and ratified.

SECTION 5. The officers, employees and agents of the City are hereby authorized and directed to take all actions and do all things which they, or any of them, may deem necessary or desirable to accomplish the purposes of this Resolution and not inconsistent with the provisions hereof.

SECTION 6. This Resolution shall take effect immediately upon its adoption.

The City Clerk of the City of Ontario shall certify as to the adoption of this Resolution.

PASSED, APPROVED, AND ADOPTED this 19th day of April 2022.

_____
PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO FORM:

_____
BEST BEST & KRIEGER, LLP
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. 2022- was duly passed and adopted by the City Council of the City of Ontario at their regular meeting held April 19, 2022 by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

The foregoing is the original of Resolution No. 2022- duly passed and adopted by the Ontario City Council at their regular meeting held April 19, 2022.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

EXHIBIT A

CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 35
(COUNTRYSIDE PHASE 2 SOUTH - FACILITIES)

CANVASS AND STATEMENT OF RESULTS OF ELECTION

I hereby certify that on April 19, 2022, I canvassed the returns of the special election held on April 19, 2022, for the City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities), that the total number of ballots cast in said Community Facilities District and the total number of votes cast for and against the proposition are as follows and that the totals as shown for and against the proposition are true and correct:

	Qualified Landowner Votes	Votes Cast	YES	NO
City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities) Special Election, April 19, 2022	35	___	___	___

MEASURE SUBMITTED TO VOTE OF VOTERS: Shall the maximum aggregate amount of bonded indebtedness that City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities) (the "Community Facilities District") is authorized to incur be increase from $27,000,000 to $42,000,000, as specified in the Resolution entitled "A Resolution of the City Council of the City of Ontario, California, Deeming it Necessary to Amend Resolution No. 2017-124 In Order to Increase the Maximum Aggregate Amount of Bonded Indebtedness that City of Ontario Community Facilities District No. 35 (Countryside Phase 2 South - Facilities) is Authorized to Incur," adopted by the City Council of the City of Ontario on April 19, 2022?

IN WITNESS WHEREOF, I HAVE HEREUNTO SET MY HAND this 19th day of April 2022.

BY: _____
SHEILA MAUTZ, CITY CLERK

CITY OF ONTARIO *Agenda Report* **April 19, 2022**	**SECTION:** **PUBLIC HEARINGS**
Department: Investments & Revenue Resources Prepared By: Cruz Torres Staff Member Presenting: Armen Harkalyan, Executive Director of Finance Reviewed By: Cecilia House, Armen Harkalyan Approved By:	Submitted To: Council/OHA Approved: _____ Continued To: _____ Denied: _____ Item No: 18

SUBJECT: **A PUBLIC HEARING TO CONSIDER A RESOLUTION REGARDING THE FORMATION OF THE CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 63 (OLIVE AND OLEANDER); ADOPTION OF A RESOLUTION TO INCUR BONDED INDEBTEDNESS; AND INTRODUCTION OF AN ORDINANCE LEVYING SPECIAL TAXES**

RECOMMENDATION: That the City Council consider and:

A. Adopt a resolution of formation of Community Facilities District No. 63 (Olive and Oleander), authorizing the levy of special taxes within the community facilities district, and establishing an appropriations limit for the community facilities district;
B. Adopt a resolution deeming it necessary to incur bonded indebtedness within Community Facilities District No. 63 (Olive and Oleander);
C. Adopt a resolution calling a special election for City of Ontario Community Facilities District No. 63 (Olive and Oleander);
D. Adopt a resolution declaring the results of the special election and directing the recording of a Notice of Special Tax Lien;
E. Introduce and waive further reading of an ordinance levying special taxes within City of Ontario Community Facilities District No. 63 (Olive and Oleander); and
F. Adopt a resolution authorizing the execution and delivery of an acquisition and funding agreement with Shea Homes Limited Partnership, a California limited partnership.

THE FOLLOWING COUNCIL GOALS ARE BEING ACHIEVED:
Operate in a Businesslike Manner
Focus Resources in Ontario's Commercial and Residential Neighborhoods
Invest in the City's Infrastructure (Water, Streets, Sewers, Parks, Storm Drains and Public Facilities)
Ensure the Development of a Well Planned, Balanced, and Self-Sustaining Community in Ontario Ranch

FISCAL IMPACT: The use of Mello-Roos financing for facilities in the residential development of the Olive and Oleander project is estimated to generate approximately $38 million in bond proceeds to

be used to fund a portion of the public infrastructure improvements needed to serve the project. Mello-Roos bonds are not a direct obligation of the City and are paid from special taxes levied on each taxable parcel in the district; therefore, there is no General Fund impact from the issuance of Mello Roos bonds. City Council approval will be required in future years to process annual special tax levies.

BACKGROUND & ANALYSIS: The Mello-Roos Community Facilities Act of 1982 provides local government, with the consent from a majority of the property owners, the authority to establish community facilities districts for the purpose of levying special taxes to finance various kinds of public infrastructure facilities and City services. Under the Mello-Roos Act the initial steps in the formation of a community facilities district to finance public improvements and City Services are to adopt resolutions declaring the intention to establish a community facilities district, authorize the levy of special taxes, and issue bonds. Accordingly, on March 15, 2022, the City Council approved Resolution No. 2022-019, a Resolution of Intention to establish City of Ontario Community Facilities District No. 63 (Olive and Oleander) and authorize the levy of special taxes; and Resolution No. 2022-020 declaring the City Council's intention to issue bonds for the district. The Resolution of Intention set the public hearing date for the regularly scheduled City Council meeting on April 19, 2022, to consider formation matters.

In the First Amended and Restated Agreement for the Financing and Construction of Limited Infrastructure Improvements to Serve an Easterly Portion of the New Model Colony ("First Amended and Restated Construction Agreement") between the City and NMC Builders, LLC, the City agreed to cooperate with the members of NMC Builders, LLC in the formation of community facilities districts to assist in the financing of the public improvements included in the agreement. Shea Homes LP of California have provided a written petition to the City requesting formation of a community facilities district for the Olive and Oleander project in Ontario Ranch. The Olive and Oleander project addresses the development of approximately 21.09 gross acres located west of Cleveland Avenue, east of Hamner Avenue, north of Edison Avenue, and south of Ontario Ranch Road. At build out, the project is projected to include 137 attached units and 87 detached units.

Included, as part of the resolution of formation is the proposed Rate and Method of Apportionment of Special Tax for the District. Under the proposed Rate and Method of Apportionment, the portion of the maximum annual special tax rates which will be used to fund debt service payments on the bonds is fixed and will not increase over time. As proposed, the amount of bonds authorized for the district ($38 million) is set intentionally higher than the current estimated bond amount (approximately $10.3 million) in order to allow future City Councils the option, without increasing the amount of the annual special taxes, to issue additional bonds to replace and/or construct new public infrastructure improvements in the future, or to fund City services. The term and structure of the Rate and Method of Apportionment of Special Tax for the Olive and Oleander project is consistent with those of previously adopted Rates and Methods of Apportionment for Ontario Ranch community facilities districts. This ensures that the special tax rates levied on all residential property owners in community facilities districts in Ontario Ranch are developed in a consistent and equivalent manner. In addition, under the provisions of the Mello-Roos Act, to ensure that home buyers are making an informed decision, all residential builders in the Ontario Ranch districts will be required to disclose the maximum annual special tax amount to each homeowner before entering into a sales contract.

Attached are five resolutions and an ordinance. The first attached resolution establishes the community facilities district, with the rate and method of apportionment of special taxes, and authorizes the levy of special taxes within the district. The second attached resolution deems the necessity of incurring bonded indebtedness for the district. The third attached resolution calls for a special landowner election to be held on April 19, 2022. The fourth attached resolution declares the results of the election, including a statement from the City Clerk as to the canvass of ballots, and directs the recording of the Notice of Special Tax Lien. The attached ordinance authorizes the levying of special taxes, and the final attached resolution authorizes the execution and delivery of an acquisition and funding agreement with Shea Homes LP of California.

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, OF FORMATION OF THE CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 63 (OLIVE AND OLEANDER FACILITIES), AUTHORIZING THE LEVY OF A SPECIAL TAX WITHIN THE COMMUNITY FACILITIES DISTRICT AND ESTABLISHING AN APPROPRIATIONS LIMIT FOR THE COMMUNITY FACILITIES DISTRICT.

WHEREAS, on March 15, 2022, the City Council (the "City Council") of the City of Ontario (the "City"), pursuant to the Mello-Roos Community Facilities Act of 1982 (the "Act"), adopted a resolution entitled "A Resolution of the City Council of the City of Ontario, California, of Intention to Establish a Community Facilities District, Proposed to be Named City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities), and to Authorize the Levy of Special Taxes" (the "Resolution of Intention"), stating its intention to establish a community facilities district (the "Community Facilities District") proposed to be named City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities), to authorize the levy of special taxes within the Community Facilities District to finance certain public facilities and services and setting the date for a public hearing to be held on the establishment of the Community Facilities District; and

WHEREAS, pursuant to the Resolution of Intention, notice of said public hearing was published in the *Inland Valley Daily Bulletin*, a newspaper of general circulation published in the area of the Community Facilities District, in accordance with the Act; and

WHEREAS, on this date, the City Council opened, conducted and closed said public hearing; and

WHEREAS, pursuant to the Resolution of Intention, each officer of the City who is or will be responsible for providing one or more of the proposed types of public facilities or services was directed to study, or cause to be studied, the proposed Community Facilities District and, at or before said public hearing, file a report with the City Council containing a brief description of the public facilities and services by type that will in his or her opinion be required to adequately meet the needs of the Community Facilities District, and his or her estimate of the cost of providing such public facilities and services; such officers were also directed to estimate the fair and reasonable cost of the public facilities proposed to be purchased as completed public facilities and of the incidental expenses proposed to be paid; and

WHEREAS, said report was so filed with the City Council and made a part of the record of said public hearing; and

WHEREAS, at the hearing, the testimony of all persons for or against the establishment of the Community Facilities District, the extent of the Community Facilities District and the furnishing of the specified types of public facilities and services was heard; and

WHEREAS, written protests against the establishment of the Community Facilities District, the furnishing of any specified type or types of facilities and services within the Community Facilities District or the levying of any specified special tax were not made or filed at or before said hearing by 50% or more of the registered voters, or six registered voters, whichever is more, residing within the territory proposed to be included in the Community Facilities District, or the owners of one-half or more of the area of land in the territory proposed to be included in the Community Facilities District and not exempt from the special tax; and

WHEREAS, there has been filed with the City Clerk of the City a letter from the Registrar of Voters of the County of San Bernardino indicating that no persons were registered to vote within the territory of the proposed Community Facilities District as of March 17, 2022, and, accordingly, that 12 or more persons have not been registered to vote within the territory of the proposed Community Facilities District for each of the 90 days preceding the close of said public hearing; and

WHEREAS, Section 53314.9 of the Act provides that, at any time either before or after the formation of a community facilities district, the legislative body may accept advances of funds from any source, including, but not limited to, private persons or private entities and may provide, by resolution, for the use of those funds for any authorized purpose, including, but not limited to, paying any cost incurred by the local agency in creating a community facilities district; and

WHEREAS, Section 53314.9 of the Act further provides that the legislative body may enter into an agreement, by resolution, with the person or entity advancing the funds, to repay all or a portion of the funds advanced, as determined by the legislative body, with or without interest, under all the following conditions: (a) the proposal to repay the funds is included in both the resolution of intention to establish a community facilities district adopted pursuant to Section 53521 of the Act and in the resolution of formation to establish a community facilities district pursuant to Section 53325.1 of the Act, (b) any proposed special tax is approved by the qualified electors of the community facilities district pursuant to the Act, and (c) any agreement shall specify that if the qualified electors of the community facilities district do not approve the proposed special tax, the local agency shall return any funds which have not been committed for any authorized purpose by the time of the election to the person or entity advancing the funds; and

WHEREAS, the City and Shea Homes Limited Partnership (“Shea Homes”) entered into a Deposit and Reimbursement Agreement, dated as of January 1, 2022 (the “Deposit Agreement”), that provides for the advancement of funds by Shea Homes to be used to pay costs incurred in connection with the establishment of the Community Facilities District and the issuance of special tax bonds thereby, and provides for the reimbursement to Shea Homes of such funds advanced, without interest, from the proceeds of any such bonds issued by the Community Facilities District; and

WHEREAS, in accordance with Section 53314.9 of the Act, the City desires to accept such advances and to reimburse Shea Homes therefor, without interest, from the proceeds of special tax bonds issued by the Community Facilities District;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Ontario as follows:

SECTION 1. The foregoing recitals are true and correct.

SECTION 2. The Community Facilities District is hereby established pursuant to the Act.

SECTION 3. The Community Facilities District is hereby named "City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities)."

SECTION 4. The public facilities (the "Facilities") proposed to be financed by the Community Facilities District pursuant to the Act are described under the caption "Facilities" on Exhibit A hereto, which is by this reference incorporated herein. Those Facilities proposed to be purchased as completed public facilities are described under the caption "Facilities to be Purchased" on Exhibit A hereto. The services (the "Services") proposed to be financed by the Community Facilities District pursuant to the Act are described under the caption "Services" on Exhibit A hereto. The incidental expenses proposed to be incurred are described under the caption "Incidental Expenses" on Exhibit A hereto. All or any portion of the Facilities may be financed through a financing plan, including, but not limited to, a lease, lease-purchase or installment-purchase arrangement.

SECTION 5. The proposed special tax to be levied within the Community Facilities District has not been precluded by majority protest pursuant to Section 53324 of the Act.

SECTION 6. Except where funds are otherwise available, a special tax sufficient to pay for all Facilities and Services, secured by recordation of a continuing lien against all nonexempt real property in the Community Facilities District, will be annually levied within the Community Facilities District. The rate and method of apportionment of the special tax (the "Rate and Method"), in sufficient detail to allow each landowner within the proposed Community Facilities District to estimate the maximum amount that he or she will have to pay, is described in Exhibit B attached hereto, which is by this reference incorporated herein. The conditions under which the obligation to pay the special tax to pay for Facilities may be prepaid and permanently satisfied are specified in the Rate and Method. The special tax will be collected in the same manner as ordinary *ad valorem* property taxes or in such other manner as the City Council shall determine, including direct billing of the affected property owners.

SECTION 7. The special tax may only finance the Services to the extent that they are in addition to those provided in the territory of the Community Facilities District before the Community Facilities District is created. The Services may not supplant services already available within that territory when the Community Facilities District is created.

SECTION 8. The tax year after which no further special tax to pay for Facilities will be levied against any parcel used for private residential purposes is specified in the Rate and Method. Under no circumstances shall the special tax to pay for Facilities in any

fiscal year against any parcel used for private residential purposes be increased as a consequence of delinquency or default by the owner or owners of any other parcel or parcels within the Community Facilities District by more than 10% above the amount that would have been levied in that fiscal year had there never been any such delinquencies or defaults. For purposes of this paragraph, a parcel shall be considered "used for private residential purposes" not later than the date on which an occupancy permit for private residential use is issued.

SECTION 9. Pursuant to Section 53344.1 of the Act, the City Council hereby reserves to itself the right and authority to allow any interested owner of property within the Community Facilities District, subject to the provisions of said Section 53344.1 and to those conditions as it may impose, and any applicable prepayment penalties as prescribed in the bond indenture or comparable instrument or document, to tender to the Community Facilities District treasurer in full payment or part payment of any installment of the special taxes or the interest or penalties thereon which may be due or delinquent, but for which a bill has been received, any bond or other obligation secured thereby, the bond or other obligation to be taken at par and credit to be given for the accrued interest shown thereby computed to the date of tender.

SECTION 10. The name, address and telephone number of the office that will be responsible for preparing annually a current roll of special tax levy obligations by assessor's parcel number and that will be responsible for estimating further special tax levies pursuant to Section 53340.2 of the Act are as follows: Management Analyst, Financial Services, City of Ontario, 303 East B Street, Ontario, California 91764, (909) 395-2341.

SECTION 11. Upon recordation of a notice of special tax lien pursuant to Section 3114.5 of the California Streets and Highways Code, a continuing lien to secure each levy of the special tax shall attach to all nonexempt real property in the Community Facilities District and this lien shall continue in force and effect until the special tax obligation is prepaid and permanently satisfied and the lien canceled in accordance with law or until collection of the tax by the City Council ceases.

SECTION 12. The boundary map of the Community Facilities District has been recorded in San Bernardino County in Book 90 at Page 10 of Maps of Assessments and Community Facilities Districts in the San Bernardino County Recorder's Office (Document No. 2022-0100950).

SECTION 13. The annual appropriations limit, as defined by subdivision (h) of Section 8 of Article XIII B of the California Constitution, of the Community Facilities District is hereby established at $38,000,000.

SECTION 14. Pursuant to the provisions of the Act, the levy of the special tax and a proposition to establish the appropriations limit specified above shall be subject to the approval of the qualified electors of the Community Facilities District at a special election. The City Council hereby finds and determines that no persons were registered to vote within the territory of the proposed Community Facilities District as of March 17, 2022, and that 12 or more persons have not been registered to vote within the territory of the Community Facilities District for each of the 90 days preceding the close

of the public hearing held by the City Council on the establishment of the Community Facilities District. Accordingly, pursuant to Section 53326 of the Act, the vote shall be by the landowners of the Community Facilities District and each person who is the owner of land as of the close of said public hearings, or the authorized representative thereof, shall have one vote for each acre or portion of an acre that he or she owns within the Community Facilities District not exempt from the special tax. The voting procedure shall be by mailed or hand-delivered ballot.

SECTION 15. Shea Homes has heretofore advanced certain funds, and may advance additional funds, which have been or may be used to pay costs incurred in connection with the creation of the Community Facilities District and the issuance of special tax bonds thereby. The City Council has previously approved the acceptance of such funds for the purpose of paying costs incurred in connection with the creation of the Community Facilities District and the issuance of special tax bonds thereby. The City Council proposes to repay all or a portion of such funds expended for such purpose, solely from the proceeds of such bonds, pursuant to the Deposit Agreement. The Deposit Agreement is hereby incorporated herein as though set forth in full herein.

SECTION 16. The City Council hereby finds and determines that all proceedings up to and including the adoption of this Resolution were valid and in conformity with the requirements of the Act. In accordance with Section 53325.1 of the Act, such finding shall be final and conclusive.

SECTION 17. All actions heretofore taken by the officers, employees and agents of the City with respect to the establishment of the Community Facilities District, or in connection with or related to any of the matters referred to herein, are hereby approved, confirmed and ratified.

SECTION 18. The officers, employees and agents of the City are hereby authorized and directed to take all actions and do all things which they, or any of them, may deem necessary or desirable to accomplish the purposes of this Resolution and not inconsistent with the provisions hereof.

SECTION 19. This Resolution shall take effect immediately upon its adoption.

The City Clerk of the City of Ontario shall certify as to the adoption of this Resolution.

PASSED, APPROVED, AND ADOPTED this 19th day of April 2022.

_____

PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO FORM:

_____
BEST BEST & KRIEGER, LLP
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. 2022- was duly passed and adopted by the City Council of the City of Ontario at their regular meeting held April 19, 2022 by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

The foregoing is the original of Resolution No. 2022- duly passed and adopted by the Ontario City Council at their regular meeting held April 19, 2022.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

EXHIBIT A

FACILITIES, SERVICES AND INCIDENTAL EXPENSES

Facilities

The types of facilities to be financed by the Community Facilities District are street and bridge improvements, including grading, paving, curbs and gutters, sidewalks, street signalization and signage, street lights and parkway and landscaping related thereto, domestic and recycled water distribution facilities, sewer collection facilities, solid waste facilities, storm drainage facilities, park and recreation facilities and equipment, aquatic facilities and equipment, fire facilities and equipment, police facilities and equipment, library facilities and equipment, fiber optic telecommunication system facilities, general governmental office, administrative and meeting facilities, and land, rights-of-way and easements necessary for any of such facilities.

Facilities to be Purchased

The types of facilities to be purchased as completed facilities are street and bridge improvements, including grading, paving, curbs and gutters, sidewalks, street signalization and signage, street lights and parkway and landscaping related thereto, domestic and recycled water distribution facilities, sewer collection facilities, solid waste facilities, storm drainage facilities, park and recreation facilities and equipment, aquatic facilities and equipment, fire facilities and equipment, police facilities and equipment, library facilities and equipment, fiber optic telecommunication system facilities, general governmental office, administrative and meeting facilities, and land, rights-of-way and easements necessary for any of such facilities.

Services

The types of services to be financed by the Community Facilities District are police protection services, fire protection and suppression services, ambulance and paramedic services, maintenance and lighting of parks, parkways, streets, roads and open space, flood and storm protection services and maintenance and operation of any real property or other tangible property with an estimated useful life of five or more years that is owned by the City.

Incidental Expenses

The incidental expenses proposed to be incurred include the following:

(a) the cost of planning and designing public facilities to be financed, including the cost of environmental evaluations of those facilities;

(b) the costs associated with the creation of the Community Facilities District, issuance of bonds, determination of the amount of taxes, collection of taxes, payment of taxes, or costs otherwise incurred in order to carry out the authorized purposes of the Community Facilities District; and

(c) any other expenses incidental to the construction, completion, and inspection of the authorized work.

EXHIBIT B

PROPOSED RATE AND METHOD OF APPORTIONMENT OF SPECIAL TAX

EXHIBIT B

CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 63
(OLIVE AND OLEANDER FACILITIES)

RATE AND METHOD OF APPORTIONMENT OF SPECIAL TAX

Special Taxes shall be levied on all Assessor's Parcels in the City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities) ("CFD No. 63") and collected each Fiscal Year, commencing in Fiscal Year 2022-23, in an amount determined by the City Council of the City of Ontario through the application of the Rate and Method of Apportionment, as described below. All of the real property in CFD No. 63, unless exempted by law or by the provisions hereof, shall be taxed for the purposes, to the extent, and in the manner herein provided.

A. DEFINITIONS

The terms hereinafter set forth have the following meanings:

"Acre" or **"Acreage"** means the land area of an Assessor's Parcel as shown on an Assessor's Parcel Map, or if the land area is not shown on an Assessor's Parcel Map, the land area shown on the applicable Final Subdivision Map, parcel map, condominium plan, or other recorded County map.

"Act" means the Mello-Roos Community Facilities Act of 1982, as amended, being Chapter 2.5 of Part 1 of Division 2 of Title 5 of the California Government Code.

"Administrative Expenses" means the following actual or reasonably estimated costs directly related to the administration of CFD No. 63: the costs of computing the Special Taxes and preparing the annual Special Tax collection schedules (whether by the City or CFD No. 63 or both); the costs of collecting the Special Taxes (whether by the County or otherwise); the costs of remitting the Special Taxes to the Trustee; the costs of the Trustee (including its legal counsel) in the discharge of the duties required of it under the Indenture; the costs to the City or CFD No. 63 of complying with arbitrage rebate requirements; the costs to the City or CFD No. 63 of complying with City, CFD No. 63, or obligated persons disclosure requirements associated with applicable federal and state securities laws and of the Act; the costs associated with preparing Special Tax disclosure statements and responding to public inquiries regarding the Special Taxes; the costs of the City or CFD No. 63 related to the analysis and reduction, if any, of the Special Tax on Single Family Property in accordance with Section C.1 herein; the costs of the City or CFD No. 63 related to an appeal of the Special Tax; the costs associated with the release of funds from any escrow account; the City's administration fees and third party expenses; the costs of City staff time and reasonable overhead relating to CFD No. 63; and amounts estimated or advanced by the City or CFD No. 63 for any other

administrative purposes of the CFD, including attorney's fees and other costs related to commencing and pursuing to completion any foreclosure of delinquent Special Taxes.

"Assessor's Parcel" means a lot or parcel shown in an Assessor's Parcel Map with an assigned Assessor's Parcel Number.

"Assessor's Parcel Map" means an official map of the Assessor of the County designating parcels by Assessor's Parcel Number.

"Assessor's Parcel Number" means, with respect to an Assessor's Parcel, that number assigned to such Assessor's Parcel by the County for purposes of identification.

"Assigned Special Tax" means the Special Tax for each Land Use Class of Developed Property, as determined in accordance with Section C.1.a.2 below.

"Backup Special Tax" means the Special Tax for each Land Use Class of Developed Property, as determined in accordance with Section C.1.a.3 below.

"Bonds" means any bonds or other debt (as defined in Section 53317(d) of the Act) issued by CFD No. 63 under the Act and payable from Special Taxes.

"Buildable Lot" means an individual lot, within a Final Subdivision Map or an area expected by CFD No. 63 to become Final Mapped Property, such as the area within a Tentative Tract Map, for which a building permit may be issued without further subdivision of such lot.

"CFD Administrator" means an official of the City responsible for determining the Special Tax Requirement, providing for the levy and collection of the Special Taxes, and performing the other duties provided for herein.

"CFD No. 59" means City of Ontario Community Facilities District No. 59 (Gateway Services).

"CFD No. 63" means City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities).

"City" means the City of Ontario, California.

"City Council" means the City Council of the City, acting as the legislative body of CFD No. 63.

"Contractual Impositions" means (a) a voluntary contractual assessment established and levied on an Assessor's Parcel pursuant to Chapter 29 of Part 3 of Division 7 of the California Streets and Highways Code (commencing with Section 5898.10 *et seq.*), as amended from time to time, (b) a special tax established and levied on an Assessor's Parcel pursuant to Section 53328.1 of the California Government Code and related provisions of the Act, as amended from time to time, and (c) any other fee, charge, tax, or assessment established and levied on an individual Assessor's Parcel pursuant to a

contractual agreement or other voluntary consent by the owner thereof (e.g., property owner association assessments).

"County" means the County of San Bernardino.

"Designated Buildable Lot" means a Buildable Lot for which a building permit has not been issued by the City as of the date of calculation of the Backup Special Tax.

"Developed Property" means for each Fiscal Year, all Taxable Property, exclusive of Final Mapped Property, Taxable Property Owner Association Property, and Taxable Public Property, for which a building permit or other applicable permit for new construction was issued after January 1, 2021, and before May 1 of the prior Fiscal Year.

"Expected Residential Lot Count" means 224 Buildable Lots of Single Family Property or, as determined by the CFD Administrator, the number of Buildable Lots of Single Family Property based on the most recent Tentative Tract Map(s) or most recently recorded Final Subdivision Map(s) or modified Final Subdivision Map(s).

"Facilities" means the public facilities authorized to be financed, in whole or in part, by CFD No. 63.

"Final Mapped Property" means, for each Fiscal Year, all Taxable Property, exclusive of Developed Property, Taxable Property Owner Association Property, and Taxable Public Property, which as of January 1 of the previous Fiscal Year was located within a Final Subdivision Map. The term Final Mapped Property shall include any parcel map or Final Subdivision Map, or portion thereof, that creates individual lots for which a building permit may be issued, including Parcels that are designated as a remainder Parcel (i.e., one where the size, location, etc., precludes any further subdivision or taxable use).

"Final Subdivision Map" means a final tract map, parcel map, or lot line adjustment approved by the City pursuant to the Subdivision Map Act (California Government Code Section 66410 et seq.) or a condominium plan recorded in accordance with California Civil Code Section 4285 that, in either case, creates individual lots for which building permits may be issued without further subdivision.

"Fiscal Year" means the period starting July 1 and ending on the following June 30.

"Indenture" means the indenture, fiscal agent agreement, resolution, or other instrument pursuant to which Bonds are issued, as modified, amended, and/or supplemented from time to time.

"Land Use Class" means any of the classes listed in Table 1 below.

"Lower Income Household Welfare Exemption Property" means, for each Fiscal Year, an Assessor's Parcel within the boundaries of CFD No. 63 that is subject to a welfare exemption under subdivision (g) of Section 214 of the California Revenue and

Taxation Code (or any successor statute), as indicated in the most recent County assessor's roll finalized prior to such Fiscal Year.

"Maximum Special Tax" means, with respect to an Assessor's Parcel of Taxable Property, the Maximum Special Tax determined in accordance with Section C.1 below that can be levied in any Fiscal Year on such Assessor's Parcel of Taxable Property.

"Minimum Sale Price" means the minimum price at which Units of a given Land Use Class have sold or are expected to be sold in a normal marketing environment and shall not include prices for such Units that are sold at a discount to expected sales prices for the purpose of stimulating the initial sales activity with respect to such Land Use Class.

"Non-Residential Property" means all Assessor's Parcels of Developed Property for which a building permit was issued by the City permitting the construction of one or more non-residential structures or facilities.

"Other Residential Property" means all Assessor's Parcels of Developed Property for which a building permit was issued by the City for purposes of constructing Units, excluding Single Family Attached Property and Single Family Detached Property.

"Outstanding Bonds" means all Bonds which are outstanding under and in accordance with the provisions of the Indenture.

"Price Point Consultant" means any consultant or firm of such consultants selected by CFD No. 63 that (a) has substantial experience in performing price point studies for residential units within community facilities districts established under the Act or otherwise estimating or confirming pricing for residential units in such community facilities districts, (b) has recognized expertise in analyzing economic and real estate data that relates to the pricing of residential units in such community facilities districts, (c) is in fact independent and not under the control of CFD No. 63 or the City, (d) does not have any substantial interest, direct or indirect, with or in (i) CFD No. 63, (ii) the City, (iii) any owner of real property in CFD No. 63, or (iv) any real property in CFD No. 63, and (e) is not connected with CFD No. 63 or the City as an officer or employee thereof, but who may be regularly retained to make reports to CFD No. 63 or the City.

"Price Point Study" means a price point study or a letter updating a previous price point study prepared by the Price Point Consultant pursuant to Section C herein.

"Property Owner Association Property" means, for each Fiscal Year, any property within the boundaries of CFD No. 63 that was owned by a property owner association, including any master or sub-association, as of January 1 of the prior Fiscal Year.

"Proportionately" means (a) for Developed Property in the first step of Section D below, that the ratio of the actual Special Tax levy to the Maximum Special Tax is equal for all Assessor's Parcels of Developed Property; however, for Developed Property in the fourth step of Section D below, Proportionately means that the amount of the increase above the Assigned Special Tax, if necessary, is equal for all Assessor's Parcels of Developed Property, except that if the Backup Special Tax limits the increase on any

Assessor's Parcel(s), then the amount of the increase shall be equal for the remaining Assessor's Parcels; (b) for Final Mapped Property, that the ratio of the actual Special Tax levy to the Maximum Special Tax is equal for all Assessor's Parcels of Final Mapped Property; (c) for Undeveloped Property, that the ratio of the actual Special Tax levy to the Maximum Special Tax is equal for all Assessor's Parcels of Undeveloped Property; (d) for Taxable Property Owner Association Property, that the ratio of the actual Special Tax levy to the Maximum Special Tax is equal for all Assessor's Parcels of Taxable Property Owner Association Property; and (e) for Taxable Public Property, that the ratio of the actual Special Tax levy to the Maximum Special Tax is equal for all Assessor's Parcels of Taxable Public Property.

"Public Property" means, for each Fiscal Year, property within the boundaries of CFD No. 63 that is (a) owned by, irrevocably offered to, or dedicated to the federal government, the State, the County, the City, or any local government or other public agency or (b) encumbered by an easement for purposes of public or utility right-of-way that makes impractical its use for any purpose other than that set forth in such easement; provided that any property leased by a public agency to a private entity and subject to taxation under Section 53340.1 of the Act shall be taxed and classified according to its use.

"Rate and Method of Apportionment" means this Rate and Method of Apportionment of Special Tax.

"Residential Floor Area" means all of the Square Footage of living area within the perimeter of a Unit, not including any carport, walkway, garage, overhang, patio, enclosed patio, or similar area. The determination of Residential Floor Area shall be as set forth in the building permit(s) issued for such Assessor's Parcel, or as set forth in other official records maintained by the City's Building Department or other appropriate means selected by CFD No. 63. The actual Square Footage shall be rounded up to the next whole square foot. Once such determination has been made for an Assessor's Parcel, it shall remain fixed in all future Fiscal Years unless an appeal pursuant to Section F below is approved that results in a change in the actual Square Footage.

"Residential Property" means, for each Fiscal Year, an Assessor's Parcel for which a building permit for new construction of one or more Units was issued after January 1, 2021, and before May 1 of the prior Fiscal Year.

"Services" means the services authorized to be financed, in whole or in part, by CFD No. 63.

"Single Family Attached Property" means all Assessor's Parcels of Developed Property for which a building permit or use permit was issued for construction of a residential structure consisting of two or more Units that share common walls, have separate Assessor's Parcel Numbers assigned to them (except for a duplex unit, which may share an Assessor's Parcel with another duplex unit), and may be purchased by individual homebuyers (which shall still be the case even if the Units are purchased and subsequently offered for rent by the owner of the Unit), including such residential

structures that meet the statutory definition of a condominium contained in California Civil Code Section 4125.

"Single Family Detached Property" means all Assessor's Parcels of Developed Property for which a building permit was issued for construction of a Unit, on one legal lot, that does not share a common wall with another Unit.

"Single Family Property" means all Assessor's Parcels of Single Family Attached Property and Single Family Detached Property.

"Special Tax" means the special tax authorized by the qualified electors of CFD No. 63 to be levied within the boundaries of CFD No. 63 to pay for Facilities and Services.

"Special Tax Requirement" means for any Fiscal Year that amount required, after taking into account available amounts held in the funds and accounts established under the Indenture, for CFD No. 63 to: (i) pay debt service on all Outstanding Bonds which is due in the calendar year that commences in such Fiscal Year; (ii) pay periodic costs on the Bonds, including, but not limited to, credit enhancement and rebate payments on the Bonds; (iii) pay a pro rata share of Administrative Expenses; (iv) provide any amounts required to establish or replenish any reserve fund for the Bonds; (v) pay directly for acquisition or construction of Facilities, or the cost of Services, to the extent that the inclusion of such amounts does not increase the Special Tax levy on Final Mapped Property or Undeveloped Property; and (vi) provide an amount equal to Special Tax delinquencies based on the historical delinquency rate for the Special Tax as determined by the CFD Administrator.

"Square Footage" or **"Sq. Ft."** means the floor area square footage reflected on the original construction building permit, or as set forth in other official records maintained by the City's Building Department or other appropriate means selected by CFD No. 63, issued for construction of Residential Property or Non-Residential Property, plus any square footage subsequently added to a building of Non-Residential Property after issuance of a building permit for expansion or renovation of such building.

"State" means the State of California.

"Taxable Property" means, for each Fiscal Year, all of the Assessor's Parcels within the boundaries of CFD No. 63 that are not exempt from the Special Taxes pursuant to law or Section E below.

"Taxable Property Owner Association Property" means, for each Fiscal Year, all Assessor's Parcels of Property Owner Association Property that are not exempt from the Special Taxes pursuant to Section E below.

"Taxable Public Property" means, for each Fiscal Year, all Assessor's Parcels of Public Property that are not exempt from the Special Taxes pursuant to law or Section E below.

"Tentative Tract Map" means a map: (i) showing a proposed subdivision of an Assessor's Parcel(s) and the conditions pertaining thereto; (ii) that may or may not be based on a detailed survey; and (iii) that is not recorded by the County to create legal lots.

"Total Tax Burden" means, for a Unit within a Land Use Class, for the Fiscal Year in which the Total Tax Burden is being calculated, the sum of (a) the Assigned Special Tax for such Land Use Class for such Fiscal Year, plus (b) the CFD No. 59 special tax for services for such Land Use Class for such Fiscal Year, plus (c) the *ad valorem* property taxes, special assessments, special taxes for any overlapping community facilities districts, and any other governmental fees, charges (other than fees or charges for services such as sewer and trash), taxes, and assessments (which do not include Contractual Impositions) collected by the County on *ad valorem* tax bills and that the CFD Administrator estimates would be levied or imposed on such Unit in such Fiscal Year if the residential dwelling unit thereon or therein had been completed and sold, and was subject to such fees, charges, taxes, and assessments in such Fiscal Year.

"Trustee" means the trustee or fiscal agent under the Indenture.

"TTM 20265" means Tentative Tract Map No. 20265, the area of which is located within CFD No. 63.

"Undeveloped Property" means, for each Fiscal Year, all Taxable Property not classified as Developed Property, Final Mapped Property, Taxable Public Property, or Taxable Property Owner Association Property.

"Unit" means an individual single-family detached or attached home, townhome, condominium, apartment, or other residential dwelling unit, including each separate living area within a half-plex, duplex, triplex, fourplex, or other residential structure.

B. ASSIGNMENT TO LAND USE CATEGORIES

Each Fiscal Year, beginning with Fiscal Year 2022-23, all Taxable Property within CFD No. 63 shall be classified as Developed Property, Final Mapped Property, Taxable Public Property, Taxable Property Owner Association Property, or Undeveloped Property and shall be subject to Special Taxes in accordance with the Rate and Method of Apportionment as determined pursuant to Sections C and D below. Assessor's Parcels of Developed Property shall be further classified as Single Family Detached Property or Single Family Attached Property, Other Residential Property, or Non-Residential Property. Assessor's Parcels of Single Family Detached Property shall be assigned to Land Use Classes 1 through 5 and Assessor's Parcels of Single Family Attached Property shall be assigned to Land Use Classes 6 through 10, as listed in Table 1 below based on the Residential Floor Area of the Units on such Assessor's Parcels. Other Residential Property shall be assigned to Land Use Class 11, and Non-Residential Property shall be assigned to Land Use Class 12.

C. MAXIMUM SPECIAL TAX

1. Special Tax

At least 30 days prior to the issuance of Bonds, the Assigned Special Tax on Developed Property (set forth in Table 1 below) shall be analyzed in accordance with and subject to the conditions set forth in this Section C. At such time, CFD No. 63 shall select and engage a Price Point Consultant and the CFD Administrator shall request the Price Point Consultant to prepare a Price Point Study setting forth the Minimum Sale Price of Units within each Land Use Class. If based upon such Price Point Study the CFD Administrator calculates that the Total Tax Burden applicable to Units within one or more Land Use Classes of Single Family Property to be constructed within CFD No. 63 exceeds 1.95% of the Minimum Sale Price of such Units, the Assigned Special Tax shall be reduced to the extent necessary to cause the Total Tax Burden that shall apply to Units within such Land Use Class(es) not to exceed 1.95% of the Minimum Sale Price of such Units.

Each Assigned Special Tax reduction for a Land Use Class shall be calculated by the CFD Administrator separately, and it shall not be required that such reduction be proportionate among Land Use Classes. In connection with any reduction in the Assigned Special Tax, the Backup Special Tax shall also be reduced by the CFD Administrator based on the percentage reduction in Maximum Special Tax revenues within the Tentative Tract Map area(s) where the Assigned Special Tax reductions occurred. Upon determining the reductions, if any, in the Assigned Special Tax and Backup Special Tax required pursuant to this Section C, the CFD Administrator shall complete the Certificate of Modification of Special Tax substantially in the form attached hereto as Exhibit 1 (the "Certificate of Modification"), shall execute such completed Certificate of Modification, and shall deliver such executed Certificate of Modification to CFD No. 63. Upon receipt thereof, if in satisfactory form, CFD No. 63 shall execute such Certificate of Modification. The reduced Assigned Special Tax and Backup Special Tax specified in such Certificate of Modification shall become effective upon the execution of such Certificate of Modification by CFD No. 63.

The Special Tax reductions required pursuant to this section shall be reflected in an amended notice of Special Tax lien, which CFD No. 63 shall cause to be recorded with the County Recorder as soon as practicable after execution of the Certificate of Modification by CFD No. 63. The reductions in this section apply to Single Family Property, but not to Other Residential Property or Non-Residential Property.

a. Developed Property

1) *Maximum Special Tax*

The Maximum Special Tax that may be levied in any Fiscal Year for each Assessor's Parcel classified as Developed Property shall

be the greater of (i) the amount derived by application of the Assigned Special Tax or (ii) the amount derived by application of the Backup Special Tax. The Maximum Special Tax shall not increase in future years, other than as calculated pursuant to Section C.1.a.3 below.

2) *Assigned Special Tax*

The Assigned Special Tax that may be levied in any Fiscal Year for each Land Use Class is shown below in Table 1.

TABLE 1
ASSIGNED SPECIAL TAX – DEVELOPED PROPERTY

Land Use Class	Description	Residential Floor Area (Square Footage)	Assigned Special Tax
1	Single Family Detached Property	< 2,001	$3,583 per Unit
2	Single Family Detached Property	2,001 – 2,200	$3,831 per Unit
3	Single Family Detached Property	2,201 – 2,400	$3,986 per Unit
4	Single Family Detached Property	2,401 – 2,600	$4,296 per Unit
5	Single Family Detached Property	> 2,600	$4,400 per Unit
6	Single Family Attached Property	< 1,301	$2,811 per Unit
7	Single Family Attached Property	1,301 – 1,450	$3,060 per Unit
8	Single Family Attached Property	1,451 – 1,600	$3,226 per Unit
9	Single Family Attached Property	1,601 – 1,750	$3,433 per Unit
10	Single Family Attached Property	> 1,750	$3,682 per Unit
11	Other Residential Property		$71,302 per Acre
12	Non-Residential Property		$71,302 per Acre

3) Backup Special Tax

The Backup Special Tax shall be $4,038 per Unit for Single Family Detached Property and $3,249 for Single Family Attached Property. However, if the Expected Residential Lot Count does not equal 87 for Single Family Detached Property or 137 for Single Family Attached Property, and the City has not issued Bonds, then the Backup Special Tax for Designated Buildable Lots of Single Family Property shall be calculated separately for Single Family Detached Property and Single Family Attached Property according to the following formula:

Backup Special Tax = $351,277 ÷ Expected Residential Lot Count for Single Detached Family Property

or $445,092 ÷ Expected Residential Lot Count for Single Attached Family Property

If any portion of a Final Subdivision Map, or any area expected by CFD No. 63 to become Final Mapped Property, such as the area within TTM 20265, or any other Tentative Tract Map, changes any time after the City has issued Bonds, causing an adjustment to the number of Designated Buildable Lots, then the Backup Special Tax for all Designated Buildable Lots of Single Family Detached Property and Single Family Attached Property subject to the change shall be calculated according to the following steps:

Step 1: Determine the total Backup Special Tax that could have been collected from Designated Buildable Lots, separately for Single Family Detached Property and Single Family Attached Property, prior to the Final Subdivision Map or expected Final Mapped Property change.

Step 2: Divide the amount determined in Step 1 by the number of Designated Buildable Lots, separately for Single Family Detached Property and Single Family Attached Property, that exists after the Final Subdivision Map or expected Final Mapped Property change.

Step 3: Apply the amount determined in Step 2 as the Backup Special Tax per Unit for Single Family Detached Property and Single Family Attached Property.

The Backup Special Tax for an Assessor's Parcel shall not change once an Assessor's Parcel is classified as Developed Property.

b. Final Mapped Property, Taxable Public Property, Taxable Property Owner Association Property, and Undeveloped Property

The Maximum Special Tax for Final Mapped Property, Taxable Public Property, Taxable Property Owner Association Property, and Undeveloped Property shall be $71,302 per Acre, and shall not be subject to increase or reduction and, therefore, shall remain the same in every Fiscal Year.

2. Multiple Land Use Classes on an Assessor's Parcel

In some instances an Assessor's Parcel of Developed Property may contain more than one Land Use Class. The Maximum Special Tax levied on such Assessor's Parcel shall be the sum of the Maximum Special Tax for all Units of Single Family Property and Acres of Other Residential Property and Non-Residential Property (based on the pro rata share of Square Footage between Other Residential Property and Non-Residential Property, according to the applicable building permits, Final Subdivision Map, parcel map, condominium plan, or other recorded County map) located on that Assessor's Parcel.

D. METHOD OF APPORTIONMENT OF THE SPECIAL TAX

Each Fiscal Year, beginning with Fiscal Year 2022-23, the CFD Administrator shall determine the Special Tax Requirement for such Fiscal Year. The Special Tax shall then be levied as follows:

First: If needed to satisfy the Special Tax Requirement, the Special Tax shall be levied Proportionately on each Assessor's Parcel of Developed Property up to 100% of the applicable Assigned Special Tax;

Second: If additional monies are needed to satisfy the Special Tax Requirement after the first step has been completed, then the Special Tax shall be levied Proportionately on each Assessor's Parcel of Final Mapped Property up to 100% of the Maximum Special Tax for Final Mapped Property;

Third: If additional monies are needed to satisfy the Special Tax Requirement after the first two steps have been completed, then the Special Tax shall be levied Proportionately on each Assessor's Parcel of Undeveloped Property up to 100% of the Maximum Special Tax for Undeveloped Property;

Fourth: If additional monies are needed to satisfy the Special Tax Requirement after the first three steps have been completed, then the levy of the Special Tax on each Assessor's Parcel of Developed Property whose Maximum Special Tax is determined through the application of the Backup Special Tax shall be increased Proportionately from the Assigned Special Tax up to the Maximum Special Tax for each such Assessor's Parcel;

Fifth: If additional monies are needed to satisfy the Special Tax Requirement after the first four steps have been completed, then the Special Tax shall be levied Proportionately on each Assessor's Parcel of Taxable Property Owner Association Property up to the Maximum Special Tax for Taxable Property Owner Association Property;

Sixth: If additional monies are needed to satisfy the Special Tax Requirement after the first five steps have been completed, then the Special Tax shall be levied Proportionately on each Assessor's Parcel of Taxable Public Property up to the Maximum Special Tax for Taxable Public Property.

Notwithstanding the above, under no circumstances shall the Special Tax levied in any Fiscal Year on any Assessor's Parcel of Single Family Property or Other Residential Property for which an occupancy permit for private residential use has been issued be increased as a result of delinquency or default by the owner or owners of any other Assessor's Parcel or Assessor's Parcels within CFD No. 63 by more than ten percent above the amount that would have been levied in that Fiscal Year had there never been any such delinquencies or defaults.

E. EXEMPTIONS

No Special Tax shall be levied on up to 3.23 Acres of Public Property and up to 5.45 Acres of Property Owner Association Property. Tax-exempt status will be assigned by the CFD Administrator in the chronological order in which property becomes Public Property or Property Owner Association Property.

Property Owner Association Property or Public Property that is not exempt from the Special Tax under this section shall be subject to the levy of the Special Tax and shall be taxed Proportionately as part of the fifth or sixth step, respectively, in Section D above, up to 100% of the applicable Maximum Special Tax for Taxable Property Owner Association Property and Taxable Public Property. No Special Tax shall be levied in any Fiscal Year on Assessor's Parcels that have fully prepaid the Special Tax obligation pursuant to the formula set forth in Section H.

No Special Tax shall be levied on Lower Income Household Welfare Exemption Property; provided, however, that if, in any Fiscal Year, applicable law does not require that Lower Income Household Welfare Exemption Property be exempt from some portion, or all, of the Special Tax, such portion, or all, of the Special Tax shall be levied on such property in accordance with this Rate and Method of Apportionment based on the Land Use Class to which the Assessor's Parcel is assigned.

F. APPEALS

Any property owner may file a written appeal of the Special Tax with CFD No. 63 claiming that the amount or application of the Special Tax is not correct. The appeal must be filed not later than one calendar year after having paid the Special Tax that is disputed, and the appellant must be current in all payments of Special Taxes. In addition, during the term of the appeal process, all Special Taxes levied must be paid on or before the payment date established when the levy was made.

The appeal must specify the reasons why the appellant claims the Special Tax is in error. The CFD Administrator shall review the appeal, meet with the appellant if the CFD Administrator deems necessary, and advise the appellant of its determination.

If the property owner disagrees with the CFD Administrator's decision relative to the appeal, the owner may then file a written appeal with the City Council whose subsequent decision shall be final and binding on all interested parties. If the decision of the CFD Administrator or subsequent decision by the City Council requires the Special Tax to be modified or changed in favor of the property owner, then the CFD Administrator shall

determine if sufficient Special Tax revenue is available to make a cash refund. If a cash refund cannot be made, then an adjustment shall be made to credit future Special Tax levy(ies).

This procedure shall be exclusive and its exhaustion by any property owner shall be a condition precedent to filing any legal action by such owner.

G. MANNER OF COLLECTION

The Special Tax shall be collected in the same manner and at the same time as ordinary *ad valorem* property taxes; provided, however, that the Special Tax may be collected in such other manner as the City Council shall determine, including direct billing of affected property owners.

H. PREPAYMENT OF SPECIAL TAX

The following definitions apply to this Section H:

"CFD Public Facilities" means $11,150,000 for each Prepayment Period, or such lower number as determined by the City Council to be sufficient to fund the Facilities and Services to be provided by CFD No. 63.

"Expenditures Fund" means funds or accounts, regardless of their names, that are established to hold moneys that are available to acquire or construct Facilities and to fund Services.

"Future Facilities Costs" means the CFD Public Facilities minus (i) Facilities and Services costs previously paid from the Expenditures Fund during the Prepayment Period in which the prepayment is being made, (ii) moneys currently on deposit in the Expenditures Fund from deposits made during the Prepayment Period in which the prepayment is being made, and (iii) moneys currently on deposit in an escrow fund that are expected to be available to finance Facilities costs. In no event shall the amount of Future Facilities Costs be less than zero.

"Prepayment Period" means one of three periods of time during which a Special Tax prepayment may be made.

"Prepayment Period 1" means July 1, 2022, through June 30, 2056.

"Prepayment Period 2" means July 1, 2056, through June 30, 2089.

"Prepayment Period 3" means July 1, 2089, through June 30, 2123.

1. Prepayment in Full

The obligation of an Assessor's Parcel to pay the Special Tax may be prepaid as described herein, provided that a prepayment may be made only for Assessor's Parcels for which a building permit for new construction was issued after January

1, 2021, and only if there are no delinquent Special Taxes with respect to such Assessor's Parcel at the time of prepayment. An owner of an Assessor's Parcel intending to prepay the Special Tax obligation shall provide the CFD Administrator with written notice of intent to prepay. Within 30 days of receipt of such written notice, the CFD Administrator shall notify such owner of the prepayment amount for such Assessor's Parcel. The CFD Administrator may charge a fee for providing this service. Prepayment in any six month period must be made not less than 45 days prior to the next occurring date that notice of redemption of Bonds from the proceeds of such prepayment may be given to the Trustee pursuant to the Indenture.

The Special Tax Prepayment Amount (defined below) shall be calculated as summarized below (capitalized terms as defined below):

Bond Redemption Amount	
plus	Redemption Premium
plus	Future Facilities Amount
plus	Defeasance Amount
plus	Administrative Fees and Expenses
less	Reserve Fund Credit
Total	Prepayment Amount

As of the proposed date of prepayment, the Special Tax Prepayment Amount (defined below) shall be calculated by the CFD Administrator as follows:

Paragraph No.

1. Confirm that no Special Tax delinquencies apply to such Assessor's Parcel, and determine the Prepayment Period for the proposed prepayment.

2. Compute the Assigned Special Tax and Backup Special Tax for the Assessor's Parcel to be prepaid based on the Developed Property Special Tax which is, or could be, charged in the current Fiscal Year. For Assessor's Parcels of Final Mapped Property (for which a building permit has been issued but which is not yet classified as Developed Property) to be prepaid, compute the Assigned Special Tax and Backup Special Tax for that Assessor's Parcel as though it was already designated as Developed Property, based upon the building permit which has already been issued for that Assessor's Parcel.

3. (a) Divide the Assigned Special Tax computed pursuant to Paragraph 2 by the total estimated Assigned Special Tax for CFD No. 63 based on the Developed Property Special Tax which could be charged in the current Fiscal Year on all expected development through buildout of CFD No. 63, excluding any Assessor's Parcels which have been prepaid, and

   (b) Divide the Backup Special Tax computed pursuant to Paragraph 2 by the estimated total Backup Special Tax at buildout of CFD No. 63, excluding any Assessor's Parcels which have been prepaid.

4. Multiply the larger quotient computed pursuant to Paragraph 3(a) or 3(b) by the Outstanding Bonds to compute the amount of Outstanding Bonds to be retired and prepaid (the "Bond Redemption Amount").

5. Multiply the Bond Redemption Amount computed pursuant to Paragraph 4 by the applicable redemption premium (e.g., the redemption price minus 100%), if any, on the Outstanding Bonds to be redeemed (the "Redemption Premium").

6. Compute the Future Facilities Costs for the applicable Prepayment Period.

7. Multiply the larger quotient computed pursuant to Paragraph 3(a) or 3(b) by the amount determined pursuant to Paragraph 6 to compute the amount of Future Facilities Costs to be prepaid (the "Future Facilities Amount").

8. Compute the amount needed to pay interest on the Bond Redemption Amount from the first bond interest and/or principal payment date following the current Fiscal Year until the earliest redemption date for the Outstanding Bonds.

9. Determine the Special Tax levied on the Assessor's Parcel in the current Fiscal Year which has not yet been paid.

10. Add the amounts computed pursuant to Paragraphs 8 and 9 to determine the "Defeasance Amount".

11. Verify the administrative fees and expenses of CFD No. 63, including the costs to compute the prepayment, the costs to invest the prepayment proceeds, the costs to redeem Bonds, and the costs to record any notices to evidence the prepayment and the redemption (the "Administrative Fees and Expenses").

12. If reserve funds for the Outstanding Bonds, if any, are at or above 100% of the reserve requirement (as defined in the Indenture) on the prepayment date, a reserve fund credit shall be calculated as a reduction in the applicable reserve fund for the Outstanding Bonds to be redeemed pursuant to the prepayment (the "Reserve Fund Credit"). No Reserve Fund Credit shall be granted if reserve funds are below 100% of the reserve requirement on the prepayment date or the redemption date.

13. The Special Tax prepayment is equal to the sum of the amounts computed pursuant to Paragraphs 4, 5, 7, 10, and 11, less the amount computed pursuant to Paragraph 12 (the "Prepayment Amount").

14. From the Prepayment Amount, the amounts computed pursuant to Paragraphs 4, 5, 10, and 12 shall be deposited into the appropriate fund as established under the Indenture and be used to retire Outstanding Bonds or make debt service payments. The amount computed pursuant to Paragraph 7 shall be deposited into the Expenditures Fund. The amount computed pursuant to Paragraph 11 shall be retained by CFD No. 63.

The Special Tax Prepayment Amount may be sufficient to redeem other than a $5,000 increment of Bonds. In such cases, the increment above $5,000, or integral multiple thereof, will be retained in the appropriate fund established under the Indenture to be used with the next prepayment of Bonds or to make debt service payments.

As a result of the payment of the current Fiscal Year's Special Tax levy as determined under Paragraph 9 (above), the CFD Administrator shall remove the current Fiscal Year's Special Tax levy for such Assessor's Parcel from the County tax rolls. With respect to any Assessor's Parcel that is prepaid during Prepayment Period 3, the CFD Administrator shall cause a suitable notice to be recorded in compliance with the Act to indicate that the Special Tax has been prepaid and that the obligation of such Assessor's Parcel to pay the Special Tax shall cease.

With respect to the Special Tax for any Assessor's Parcel that is prepaid during Prepayment Period 1 or Prepayment Period 2, the obligation of such Assessor's Parcel to pay the Special Tax shall be tolled, or suspended, through the end of such Prepayment Period, but shall resume in the first Fiscal Year of the subsequent Prepayment Period. The CFD Administrator shall cause a suitable notice to be recorded in compliance with the Act to indicate that the Special Tax has been satisfied for the remainder of the applicable Prepayment Period but has not been permanently satisfied and the obligation to pay the Special Tax will resume in the first Fiscal Year of the Prepayment Period following the Prepayment Period in which the prepayment was made. Once the obligation of an Assessor's Parcel to pay the Special Tax resumes, the Special Tax for the then applicable Prepayment Period may be prepaid.

Notwithstanding the foregoing, no Special Tax prepayment shall be allowed unless the amount of the Maximum Special Tax that may be levied on Taxable Property within CFD No. 63 (after excluding 3.23 Acres of Public Property and 5.45 acres of Property Owner Association Property) both prior to and after the proposed prepayment is at least 1.1 times the maximum annual debt service on all Outstanding Bonds.

2. Prepayment in Part

The Special Tax on an Assessor's Parcel for which a building permit for new construction was issued after January 1, 2021, may be partially prepaid. The amount of the prepayment shall be calculated as in Section H.1, except that a partial prepayment shall be calculated by the CFD Administrator according to the following formula:

$$PP = (PF - AE) \times \% + AE.$$

The terms above have the following meaning:

PP = the partial prepayment
PF = the Prepayment Amount (full prepayment) for the Special Tax calculated according to Section H.1
AE = the Administrative Fees and Expenses determined pursuant to paragraph 11 above
% = the percentage by which the owner of the Assessor's Parcel(s) is partially prepaying the Special Tax

The Special Tax partial prepayment amount must be sufficient to redeem at least a $5,000 increment of Bonds.

The owner of any Assessor's Parcel who desires such prepayment shall notify the CFD Administrator of such owner's intent to partially prepay the Special Tax and the percentage by which the Special Tax shall be prepaid. The CFD Administrator shall provide the owner with a statement of the amount required for the partial prepayment of the Special Tax for an Assessor's Parcel within thirty (30) days of the request and may charge a fee for providing this service. With respect to any Assessor's Parcel that is partially prepaid, the CFD Administrator shall (i) distribute the remitted prepayment funds according to Section H.1, and (ii) indicate in the records of CFD No. 63 that there has been a partial prepayment of the Special Tax and that a portion of the Special Tax with respect to such Assessor's Parcel, equal to the outstanding percentage (100% - "%", as defined above) of the Maximum Special Tax, shall continue to be levied on such Assessor's Parcel pursuant to Section D during the Prepayment Period in which the partial prepayment is made.

For partial prepayments made during Prepayment Period 1 or Prepayment Period 2, the full amount of the Special Tax shall resume in the first Fiscal Year of the Prepayment Period following the Prepayment Period in which the partial prepayment was made. Once the obligation of an Assessor's Parcel to pay the Special Tax resumes, the Special Tax for the then applicable Prepayment Period may be prepaid.

I. TERM OF SPECIAL TAX

The Fiscal Year after which no further Special Tax shall be levied or collected is Fiscal Year 2122-2123, except that the Special Tax that was lawfully levied in or before such Fiscal Year and that remains delinquent may be collected in subsequent years.

EXHIBIT 1

CERTIFICATE OF MODIFICATION OF SPECIAL TAX
(PAGE 1 OF 2)

CITY OF ONTARIO AND CFD NO. 63 CERTIFICATE

1. Pursuant to Section C.1 of the Rate and Method of Apportionment of Special Tax (the "Rate and Method") for City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities) ("CFD No. 63"), the Assigned Special Tax and the Backup Special Tax for Developed Property within CFD No. 63 has been modified.

    a. The information in Table 1 relating to the Assigned Special Tax for Developed Property within CFD No. 63, as stated in Section C.1.a.2 of the Rate and Method of Apportionment, has been modified as follows:

TABLE 1
ASSIGNED SPECIAL TAX – DEVELOPED PROPERTY

Land Use Class	Description	Residential Floor Area (Square Footage)	Assigned Special Tax
1	Single Family Detached Property	< 2,001	$[ ] per Unit
2	Single Family Detached Property	2,001 – 2,200	$[ ] per Unit
3	Single Family Detached Property	2,201 – 2,400	$[ ] per Unit
4	Single Family Detached Property	2,401 – 2,600	$[ ] per Unit
5	Single Family Detached Property	> 2,600	$[ ] per Unit
6	Single Family Attached Property	< 1,301	$[ ] per Unit
7	Single Family Attached Property	1,301 – 1,450	$[ ] per Unit
8	Single Family Attached Property	1,451 – 1,600	$[ ] per Unit
9	Single Family Attached Property	1,601 – 1,750	$[ ] per Unit
10	Single Family Attached Property	> 1,750	$[ ] per Unit
11	Other Residential Property		$[ ] per Acre
12	Non-Residential Property		$[ ] per Acre

    b. The Backup Special Tax for Developed Property, as stated in Section C.1.a.3, shall be modified as follows:

EXHIBIT 1

CERTIFICATE OF MODIFICATION OF SPECIAL TAX
(PAGE 2 OF 2)

The Backup Special Tax shall be $[____] per Unit for Single Family Detached Property and $[____] per Unit for Single Family Attached Property. However, if the Expected Residential Lot Count does not equal 87 for Single Family Detached Property or 137 for Single Family Attached Property, and the City has not issued Bonds, then the Backup Special Tax for Designated Buildable Lots of Single Family Property shall be calculated separately for Single Family Detached Property and Single Family Attached Property according to the following formula:

Backup Special Tax = $[_____] ÷ Expected Residential Lot Count for Single Family Detached Property

or $[_____] ÷ Expected Residential Lot Count for Single Family Attached Property

2. The Special Tax for Developed Property may only be modified prior to the first issuance of CFD No. 63 Bonds.

3. Upon execution of this certificate by CFD No. 63, CFD No. 63 shall cause an amended notice of Special Tax lien for CFD No. 63 to be recorded reflecting the modifications set forth herein.

Capitalized undefined terms used herein have the meanings ascribed thereto in the Rate and Method. The modifications set forth in this Certificate have been calculated by the CFD Administrator in accordance with the Rate and Method.

GOODWIN CONSULTING GROUP, INC.
CFD ADMINISTRATOR

By:_____ Date:_____

The undersigned acknowledges receipt of this Certificate and of the modification of the Assigned Special Tax and Backup Special Tax for Developed Property as set forth in this Certificate.

CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 63
(OLIVE AND OLEANDER FACILITIES)

By:_____ Date:_____

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, DEEMING IT NECESSARY TO INCUR BONDED INDEBTEDNESS WITHIN THE CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 63 (OLIVE AND OLEANDER FACILITIES).

WHEREAS, on March 15, 2022, the City Council (the "City Council") of the City of Ontario (the "City"), pursuant to the Mello-Roos Community Facilities Act of 1982 (the "Act"), adopted a resolution entitled "A Resolution of the City Council of the City of Ontario, California, of Intention to Establish a Community Facilities District, Proposed to be Named City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities), and to Authorize the Levy of Special Taxes" stating its intention to establish City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities) (the "Community Facilities District") and to authorize the levy of special taxes within the Community Facilities District to finance certain public facilities and services; and

WHEREAS, on March 15, 2022, the City Council also adopted a resolution entitled "A Resolution of the City Council of the City of Ontario, California, to Incur Bonded Indebtedness of the Proposed City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities)" (the "Resolution to Incur Bonded Indebtedness") declaring the necessity for incurring bonded indebtedness and setting the date for a public hearing to be held on the proposed debt issue; and

WHEREAS, pursuant to the Resolution to Incur Bonded Indebtedness, notice of said public hearing was published in the *Inland Valley Daily Bulletin*, a newspaper of general circulation published in the area of the Community Facilities District, in accordance with the Act; and

WHEREAS, on this date, the City Council opened, conducted and closed said public hearing; and

WHEREAS, at said public hearing, any person interested, including persons owning property within the area and desiring to appear and present any matters material to the questions set forth in the Resolution to Incur Bonded Indebtedness appeared and presented such matters; and

WHEREAS, oral or written protests against the proposed debt issue were not made or filed at or before said public hearing by 50% or more of the registered voters, or six registered voters, whichever is more, residing within the territory proposed to be included in the Community Facilities District, or the owners of one-half or more of the area of land in the territory proposed to be included in the Community Facilities District and not exempt from the special tax; and

WHEREAS, on this date, the City Council adopted a resolution entitled "A Resolution of the City Council of the City of Ontario, California, of Formation of the City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities),

Authorizing the Levy of a Special Tax within the Community Facilities District and Establishing an Appropriations Limit for the Community Facilities District" (the "Resolution of Formation"); and

WHEREAS, the City Clerk of the City (the "City Clerk") is the election official that will conduct the special election on the proposition to incur bonded indebtedness for the Community Facilities District; and

WHEREAS, there has been filed with the City Clerk a letter from the Registrar of Voters of the County of San Bernardino indicating that no persons were registered to vote within the territory of the proposed Community Facilities District as of March 17, 2022, and, accordingly, that 12 or more persons have not been registered to vote within the territory of the Community Facilities District for each of the 90 days preceding the close of said public hearing; and

WHEREAS, there has been filed with the City Clerk consents and waivers of all of the landowners of record in the Community Facilities District waiving any time limit specified by Section 53326 of the Act and any requirement pertaining to the conduct of said special election, including any time limit or requirement applicable to an election pursuant to Article 5 of the Act (commencing with Section 53345 of the Act), consenting to the holding of said special election on April 19, 2022, and waiving any impartial analysis, arguments or rebuttals, as set forth in Sections 53326 and 53327 of the Act; and

WHEREAS, the City Clerk has concurred in said waivers and has concurred in holding said special election on April 19, 2022.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Ontario as follows:

SECTION 1. The foregoing recitals are true and correct.

SECTION 2. The City Council deems it necessary to incur the bonded indebtedness.

SECTION 3. The bonded indebtedness will be incurred for the purpose of financing the costs of the Facilities (as defined in the Resolution of Formation), including all costs and estimated costs incidental to, or connected with, the accomplishment of such purpose.

SECTION 4. In accordance with the previous determination of the City Council, the whole of the Community Facilities District will pay for the bonded indebtedness.

SECTION 5. The maximum aggregate amount of debt to be incurred is $38,000,000.

SECTION 6. The maximum term the bonds to be issued shall run before maturity is 40 years.

SECTION 7. The maximum annual rate of interest to be paid shall not exceed the maximum interest rate permitted by applicable law at the time of sale of the bonds, payable semiannually or at such times as the City Council or its designee shall determine, the actual rate or rates and times of payment of such interest to be determined by the City Council or its designee at the time or times of sale of the bonds.

SECTION 8. The proposition to incur the bonded indebtedness will be submitted to the voters.

SECTION 9. The City Council hereby finds and determines that no persons were registered to vote within the territory of the proposed Community Facilities District as of March 17, 2022, and that 12 or more persons have not been registered to vote within the territory of the Community Facilities District for each of the 90 days preceding the close of the public hearings held by the City Council on the proposed debt issue for the Community Facilities District. Accordingly, pursuant to Section 53326 of the Act, the vote shall be by the landowners of the Community Facilities District and each person who is the owner of land as of the close of said public hearings, or the authorized representative thereof, shall have one vote for each acre or portion of an acre that he or she owns within the Community Facilities District not exempt from the special tax.

SECTION 10. The City Council hereby finds and determines that the qualified electors of the Community Facilities District have unanimously consented (a) to the waiver of any time limit specified by Section 53326 of the Act and any requirement pertaining to the conduct of said election, including any time limit or requirement applicable to an election pursuant to Article 5 of the Act (commencing with Section 53345 of the Act), and (b) to the holding of said election on April 19, 2022. The City Council hereby finds and determines that the City Clerk has concurred in said waivers and has concurred in holding said election on April 19, 2022.

SECTION 11. The date of the special community facilities district election (which shall be consolidated with the special district election to levy a special tax within the Community Facilities District) at which time the proposition shall be submitted to the voters is April 19, 2022.

SECTION 12. The election is to be conducted by mail ballot. The mailed ballots are required to be received in the office of the City Clerk no later than 7:30 p.m. on April 19, 2022; provided, however, that if all of the qualified electors have voted prior to such time, the election may be closed with the concurrence of the City Clerk.

SECTION 13. All actions heretofore taken by the officers, employees and agents of the City with respect to the incurrence of bonded indebtedness, or in connection with or related to any of the matters referred to herein, are hereby approved, confirmed and ratified.

SECTION 14. The officers, employees and agents of the City are hereby authorized and directed to take all actions and do all things which they, or any of them, may deem necessary or desirable to accomplish the purposes of this Resolution and not inconsistent with the provisions hereof.

SECTION 15. This Resolution shall take effect immediately upon its adoption.

The City Clerk of the City of Ontario shall certify as to the adoption of this Resolution.

PASSED, APPROVED, AND ADOPTED this 19th day of April 2022.

_____
PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO FORM:

_____
BEST BEST & KRIEGER, LLP
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. 2022- was duly passed and adopted by the City Council of the City of Ontario at their regular meeting held April 19, 2022 by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

The foregoing is the original of Resolution No. 2022- duly passed and adopted by the Ontario City Council at their regular meeting held April 19, 2022.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, CALLING SPECIAL ELECTION FOR CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 63 (OLIVE AND OLEANDER FACILITIES).

WHEREAS, on this date, the City Council (the "City Council") of the City of Ontario (the "City"), pursuant to the Mello-Roos Community Facilities Act of 1982 (the "Act"), adopted a resolution entitled "A Resolution of the City Council of the City of Ontario, California, of Formation of the City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities), Authorizing the Levy of a Special Tax within the Community Facilities District and Establishing an Appropriations Limit for the Community Facilities District" (the "Resolution of Formation"), establishing City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities) (the "Community Facilities District"), authorizing the levy of a special tax within the Community Facilities District and establishing an appropriations limit for the Community Facilities District; and

WHEREAS, on this date, the City Council also adopted a resolution entitled "A Resolution of the City Council of the City of Ontario, California, Deeming it Necessary to Incur Bonded Indebtedness within the City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities)" (the "Resolution Deeming it Necessary to Incur"), deeming it necessary to incur bonded indebtedness in the maximum amount of $38,000,000; and

WHEREAS, pursuant to the provisions of said resolutions, the propositions to incur bonded indebtedness, to levy a special tax within the Community Facilities District and to establish an appropriations limit for the Community Facilities District are to be submitted to the qualified electors of the Community Facilities District as required by the Act; and

WHEREAS, the City Council desires to designate the City Clerk of the City (the "City Clerk") as the election official for the special election provided for herein; and

WHEREAS, there has been filed with the City Clerk a letter from the Registrar of Voters of the County of San Bernardino indicating that no persons were registered to vote within the territory of the proposed Community Facilities District as of March 17, 2022, and, accordingly, that 12 or more persons have not been registered to vote within the territory of the Community Facilities District for each of the 90 days preceding the close of the public hearings on the establishment of the Community Facilities District and the proposed debt issue for the Community Facilities District; and

WHEREAS, there has been filed with the City Clerk consents and waivers of all of the landowners of record in the Community Facilities District waiving any time limit specified by Section 53326 of the Act and any requirement pertaining to the conduct of said special election, including any time limit or requirement applicable to an election pursuant to Article 5 of the Act (commencing with Section 53345 of the Act), consenting to the holding of said special election on April 19, 2022 and waiving any impartial analysis, arguments or rebuttals, as set forth in Sections 53326 and 53327 of the Act; and

WHEREAS, the City Clerk has concurred in said waivers and has concurred in holding said special election on April 19, 2022.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Ontario as follows:

SECTION 1. The foregoing recitals are true and correct.

SECTION 2. Pursuant to Sections 53351, 53326 and 53325.7 of the Act, the propositions to incur bonded indebtedness, to levy a special tax within the Community Facilities District and to establish an appropriations limit for the Community Facilities District shall be submitted to the qualified electors of the Community Facilities District at an election called therefor as provided below.

SECTION 3. The City Clerk is hereby designated as the official to conduct said election.

SECTION 4. As authorized by Section 53353.5 of the Act, the propositions to incur bonded indebtedness, to levy a special tax within the Community Facilities District and to establish an appropriations limit for the Community Facilities District shall be combined into one ballot proposition.

SECTION 5. The City Council hereby finds and determines that no persons were registered to vote within the territory of the proposed Community Facilities District as of March 17, 2022, and that 12 or more persons have not been registered to vote within the territory of the Community Facilities District for each of the 90 days preceding the close of the public hearings heretofore held by the City Council on the establishment of the Community Facilities District and the proposed debt issue for the Community Facilities District. Accordingly, pursuant to Section 53326 of the Act, the vote shall be by the landowners of the Community Facilities District and each person who is the owner of land as of the close of said public hearings, or the authorized representative thereof, shall have one vote for each acre or portion of an acre that he or she owns within the Community Facilities District not exempt from the special tax.

SECTION 6. The City Council hereby finds and determines that the qualified electors of the Community Facilities District have unanimously consented (a) to the waiver of any time limit specified by Section 53326 of the Act and any requirement pertaining to the conduct of said election, including any time limit or requirement applicable to an election pursuant to Article 5 of the Act (commencing with Section 53345 of the Act), (b) to the holding of said election on April 19, 2022, and (c) to the waiver of any impartial analysis, arguments or rebuttals, as set forth in Sections 53326 and 53327 of the Act. The City Council herby finds and determines that the City Clerk has concurred in said waivers and has concurred in holding said election on April 19, 2022.

SECTION 7. The City Council hereby calls a special election to submit to the qualified electors of the Community Facilities District the combined proposition to incur bonded indebtedness, to levy a special tax within the Community Facilities District and to

establish an appropriations limit for the Community Facilities District, which election shall be held at 303 East B Street, Ontario, California, on April 19, 2022. The City Council has caused to be provided to the City Clerk, as the official to conduct said election, the Resolution of Formation, the Resolution of Deeming it Necessary to Incur, a certified map of sufficient scale and clarity to show the boundaries of the Community Facilities District, and a sufficient description to allow the City Clerk to determine the boundaries of the Community Facilities District.

The voted ballots shall be returned to the City Clerk not later than 7:30 p.m. on April 19, 2022; provided, however, that if all of the qualified electors have voted prior to such time, the election may be closed with the concurrence of the City Clerk.

SECTION 8. Pursuant to Section 53326 of the Act, the election shall be conducted by mail or hand-delivered ballot pursuant to Section 4000 *et. seq.* of the California Elections Code. Except as otherwise provided in the Act, the provisions of law regulating elections of the City, insofar as they may be applicable, will govern the election.

SECTION 9. The form of the ballot for said election is attached hereto as Exhibit A and by this reference incorporated herein, and such form of ballot is hereby approved. The City Clerk shall cause to be delivered to each of the qualified electors of the Community Facilities District a ballot in said form. Each ballot shall indicate the number of votes to be voted by the respective landowner to which it pertains.

Each ballot shall be accompanied by all supplies and written instructions necessary for the use and return of the ballot. The identification envelope for return of the ballot shall be enclosed with the ballot, shall have the return postage prepaid, and shall contain: (a) the name and address of the landowner, (b) a declaration, under penalty of perjury, stating that the voter is the owner of record or the authorized representative of the landowner entitled to vote and is the person whose name appears on the identification envelope, (c) the printed name, signature and address of the voter, (d) the date of signing and place of execution of the declaration described in clause (b) above, and (e) a notice that the envelope contains an official ballot and is to be opened only by the canvassing board.

Analysis and arguments with respect to the ballot proposition are hereby waived, as provided in Section 53327 of the Act.

SECTION 10. The City Clerk shall accept the ballots of the qualified electors in the office of the City Clerk at 303 East B Street, Ontario, California, to and including 7:30 p.m. on April 19, 2022, whether said ballots be personally delivered or received by mail. The City Clerk shall have available ballots which may be marked at said location on the election day by said qualified electors.

SECTION 11. The City Council hereby determines that the facilities and services financed by the Community Facilities District are necessary to meet increased demands placed upon local agencies as a result of development occurring in the Community Facilities District.

SECTION 12. The specific purposes of the bonded indebtedness proposed to be incurred is the financing of the Facilities (as defined in the Resolution of Formation), including all costs and estimated costs incidental to, or connected with, the accomplishment of such purpose, and the proceeds of such bonded indebtedness shall be applied only to such specific purposes.

Upon approval of the proposition to incur bonded indebtedness, and the sale of any bonds evidencing such indebtedness, the City Council shall take such action as may be necessary to cause to be established an account for deposit of the proceeds of sale of the bonds. For so long as any proceeds of the bonds remain unexpended, the Management Analyst, Financial Services of the City shall cause to be filed with the City Council, no later than January 1 of each year, a report stating (a) the amount of bond proceeds received and expended during the preceding year, and (b) the status of any project funded or to be funded from bond proceeds. Said report may relate to the calendar year, fiscal year, or other appropriate annual period, as the Management Analyst, Financial Services of the City shall determine, and may be incorporated into the annual budget, audit, or other appropriate routine report to the City Council.

SECTION 13. All actions heretofore taken by the officers, employees and agents of the City with respect to the special election called for herein, or in connection with or related to any of the matters referred to herein, are hereby approved, confirmed and ratified.

SECTION 14. The officers, employees and agents of the City are hereby authorized and directed to take all actions and do all things which they, or any of them, may deem necessary or desirable to accomplish the purposes of this Resolution and not inconsistent with the provisions hereof.

SECTION 15. This Resolution shall take effect immediately upon its adoption.

The City Clerk of the City of Ontario shall certify as to the adoption of this Resolution.

PASSED, APPROVED, AND ADOPTED this 19th day of April 2022.

_____
PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO FORM:

_____

BEST BEST & KRIEGER, LLP
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. 2022- was duly passed and adopted by the City Council of the City of Ontario at their regular meeting held April 19, 2022 by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

The foregoing is the original of Resolution No. 2022- duly passed and adopted by the Ontario City Council at their regular meeting held April 19, 2022.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

EXHIBIT A

OFFICIAL BALLOT

CITY OF ONTARIO
April 19, 2022

SPECIAL ELECTION

This ballot is for a special, landowner election. The number of votes to be voted pursuant to this ballot is ____.

INSTRUCTIONS TO VOTERS:

To vote on the measure, mark a cross (+ or X) in the voting square after the word "YES" or after the word "NO". All distinguishing marks or erasures are forbidden and make the ballot void. If you wrongly mark, tear, or deface this ballot, return it to the City Clerk of the City of Ontario and obtain another.

CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 63
(OLIVE AND OLEANDER FACILITIES)

MEASURE SUBMITTED TO VOTE OF VOTERS: Shall the City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities) (the "Community Facilities District") be authorized to incur bonded indebtedness in a maximum aggregate amount of not to exceed $38,000,000 and levy a special tax in order to finance certain facilities and services and shall the annual appropriations limit of the Community Facilities District be established in the amount of $38,000,000, all as specified in the Resolution entitled "A Resolution of the City Council of the City of Ontario, California, of Formation of the City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities), Authorizing the Levy of a Special Tax within the Community Facilities District and Establishing an Appropriations Limit for the Community Facilities District" and the Resolution entitled "A Resolution of the City Council of the City of Ontario, California, Deeming it Necessary to Incur Bonded Indebtedness within the City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities)," each adopted by the City Council of the City of Ontario on April 19, 2022?

Yes: ☐

No: ☐

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, DECLARING RESULTS OF SPECIAL ELECTION AND DIRECTING RECORDING OF NOTICE OF SPECIAL TAX LIEN.

WHEREAS, on April 19, 2022, the City Council (the "City Council") of the City of Ontario (the "City"), pursuant to the Mello-Roos Community Facilities Act of 1982 (the "Act"), adopted a resolution entitled "A Resolution of the City Council of the City of Ontario, California, Calling Special Election for City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities)" (the "Resolution Calling Election"), calling for a special election of the qualified electors within City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities) (the "Community Facilities District"); and

WHEREAS, pursuant to the terms of the Resolution Calling Election and the provisions of the Act, the special election was held on April 19, 2022; and

WHEREAS, the City Clerk of the City (the "City Clerk") has certified the canvass of the returns of the election and has filed a Canvass and Statement of Results of Election (the "Canvass"), a copy of which is attached hereto as Exhibit A.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Ontario as follows:

SECTION 1. The foregoing recitals are true and correct.

SECTION 2. The City Council has received, reviewed and hereby accepts the Canvass.

SECTION 3. The City Council hereby finds and declares that the ballot proposition submitted to the qualified electors of the Community Facilities District pursuant to the Resolution Calling Election has been passed and approved by such electors in accordance with Section 53328, Section 53355 and Section 53325.7 of the Act.

SECTION 4. The City Clerk is hereby directed to execute and cause to be recorded in the office of the County Recorder of the County of San Bernardino a notice of special tax lien in the form required by the Act, said recording to occur no later than fifteen days following adoption by the City Council of this Resolution.

SECTION 5. All actions heretofore taken by the officers, employees and agents of the City with respect to the special election, or in connection with or related to any of the matters referred to herein, are hereby approved, confirmed and ratified.

SECTION 6. The officers, employees and agents of the City are hereby authorized and directed to take all actions and do all things which they, or any of them, may deem necessary or desirable to accomplish the purposes of this Resolution and not inconsistent with the provisions hereof.

SECTION 7. This Resolution shall take effect immediately upon its adoption. The City Clerk of the City of Ontario shall certify as to the adoption of this Resolution.

PASSED, APPROVED, AND ADOPTED this 19th day of April 2022.

_____
PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO FORM:

_____
BEST BEST & KRIEGER, LLP
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. 2022- was duly passed and adopted by the City Council of the City of Ontario at their regular meeting held April 19, 2022 by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

The foregoing is the original of Resolution No. 2022- duly passed and adopted by the Ontario City Council at their regular meeting held April 19, 2022.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

EXHIBIT A

CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 63
(OLIVE AND OLEANDER FACILITIES)

CANVASS AND STATEMENT OF RESULTS OF ELECTION

I hereby certify that on April 19, 2022, I canvassed the returns of the special election held on April 19, 2022, for the City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities), that the total number of ballots cast in said Community Facilities District and the total number of votes cast for and against the proposition are as follows and that the totals as shown for and against the proposition are true and correct:

	Qualified Landowner Votes	Votes Cast	YES	NO
City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities) Special Election, April 19, 2022	22	___	___	___

MEASURE SUBMITTED TO VOTE OF VOTERS: Shall the City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities) (the "Community Facilities District") be authorized to incur bonded indebtedness in a maximum aggregate amount of not to exceed $38,000,000 and levy a special tax in order to finance certain facilities and services and shall the annual appropriations limit of the Community Facilities District be established in the amount of $38,000,000, all as specified in the Resolution entitled "A Resolution of the City Council of the City of Ontario, California, of Formation of the City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities), Authorizing the Levy of a Special Tax within the Community Facilities District and Establishing an Appropriations Limit for the Community Facilities District" and the Resolution entitled "A Resolution of the City Council of the City of Ontario, California, Deeming it Necessary to Incur Bonded Indebtedness within the City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities)," each adopted by the City Council of the City of Ontario on April 19, 2022?

IN WITNESS WHEREOF, I HAVE HEREUNTO SET MY HAND this 19th day of April 2022.

BY: _____
SHEILA MAUTZ, CITY CLERK

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, LEVYING SPECIAL TAXES WITHIN THE CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 63 (OLIVE AND OLEANDER FACILITIES).

WHEREAS, on March 15, 2022, the City Council (the "City Council") of the City of Ontario (the "City"), pursuant to the Mello-Roos Community Facilities Act of 1982 (the "Act"), adopted a resolution entitled "A Resolution of the City Council of the City of Ontario, California, of Intention to Establish a Community Facilities District, Proposed to be Named City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities), and to Authorize the Levy of Special Taxes" stating its intention to establish City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities) (the "Community Facilities District") and to finance certain public facilities (the "Facilities") and services (the "Services"); and

WHEREAS, on April 19, 2022, the City Council held a noticed public hearing on the establishment of the Community Facilities District, as required by the Act; and

WHEREAS, subsequent to the close of said hearing, the City Council adopted resolutions entitled "A Resolution of the City Council of the City of Ontario, California, of Formation of the City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities), Authorizing the Levy of a Special Tax within the Community Facilities District and Establishing an Appropriations Limit for the Community Facilities District" (the "Resolution of Formation"), "A Resolution of the City Council of the City of Ontario, California, Deeming it Necessary to Incur Bonded Indebtedness within the City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities)" and "A Resolution of the City Council of the City of Ontario, California, Calling Special Election for City of Ontario Community Facilities District No. 63 (Olive and Oleander Facilities)", which resolutions established the Community Facilities District, authorized the levy of a special tax within the Community Facilities District and called an election within the Community Facilities District on the proposition of incurring indebtedness, levying a special tax within the Community Facilities District and establishing an appropriations limit for the Community Facilities District, respectively; and

WHEREAS, on April 19, 2022, an election was held in which the qualified electors of the Community Facilities District approved said proposition by more than the two-thirds vote required by the Act.

THE CITY COUNCIL OF THE CITY OF ONTARIO DOES ORDAIN AS FOLLOWS:

SECTION 1. The City Council hereby authorizes and levies special taxes within the Community Facilities District pursuant to Sections 53328 and 53340 of the Act, at the rate and in accordance with the method of apportionment set forth in Exhibit B to the Resolution of Formation (the "Rate and Method of Apportionment"). The special taxes

are hereby levied commencing in fiscal year 2022-23 and in each fiscal year thereafter until the last fiscal year in which such special taxes are authorized to be levied pursuant to the Rate and Method of Apportionment.

SECTION 2. The City Council may, in accordance with subdivision (b) of Section 53340 of the Act, provide, by resolution, for the levy of the special tax in future tax years at the same rate or at a lower rate than the rate provided by this Ordinance. In no event shall the special tax be levied on any parcel within the Community Facilities District in excess of the maximum tax specified therefor in the Rate and Method of Apportionment.

SECTION 3. The special tax shall be levied on all of the parcels in the Community Facilities District, unless exempted by law or by the Rate and Method of Apportionment.

SECTION 4. The proceeds of the special tax shall only be used to pay, in whole or in part, the cost of providing the Facilities and Services and incidental expenses pursuant to the Act.

SECTION 5. The special tax shall be collected in the same manner as ordinary *ad valorem* property taxes are collected and shall be subject to the same penalties and the same procedure, sale and lien priority in the case of delinquency as is provided for *ad valorem* taxes, unless another procedure is adopted by the City Council.

SECTION 6. If for any reason any portion of this Ordinance is found to be invalid, or if the special tax is found inapplicable to any particular parcel within the Community Facilities District, by a court of competent jurisdiction, the balance of this Ordinance and the application of the special tax to the remaining parcels within the Community Facilities District shall not be affected.

SECTION 7. The Mayor shall sign this Ordinance and the City Clerk shall certify as to the adoption and shall cause a summary thereof to be published at least once, in a newspaper of general circulation in the City of Ontario, California within fifteen (15) days of the adoption. The City Clerk shall post a certified copy of this ordinance, including the vote for and against the same, in the Office of the City Clerk, in accordance with Government Code Section 36933.

PASSED, APPROVED, AND ADOPTED this _____ day of _____ 2022.

_____
PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO FORM:

_____
BEST BEST & KRIEGER LLP
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Ordinance No. _____ was duly introduced at a regular meeting of the City Council of the City of Ontario held _____ and adopted at the regular meeting held _____, 2022 by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

I hereby certify that the foregoing is the original of Ordinance No. _____ duly passed and adopted by the Ontario City Council at their regular meeting held _____ and that Summaries of the Ordinance were published on _____ and _____, in the Inland Valley Daily Bulletin newspaper.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

CITY OF ONTARIO *Agenda Report* **April 19, 2022**	**SECTION:** **PUBLIC HEARINGS**
Department: Planning Prepared By: Edmelynne V Hutter Staff Member Presenting: Scott Murphy, Executive Director Community Development Approved By:	Submitted To: Council/OHA Approved: _____ Continued To: _____ Denied: _____ Item No: 19

SUBJECT: **A PUBLIC HEARING TO CONSIDER A RESOLUTION APPROVING FILE NO. PSPA21-001, AN AMENDMENT TO THE PIEMONTE OVERLAY OF THE ONTARIO CENTER SPECIFIC PLAN, INCLUDING: (1) REVISING THE OVERLAY BOUNDARY, ADDING APPROXIMATELY 24.9 ACRES OF LAND LOCATED AT 4000 ONTARIO CENTER PARKWAY, TO THE OVERLAY AREA; (2) CHANGING THE LAND USE DESIGNATION ON APPROXIMATELY 4.9 ACRES OF LAND FROM OFFICE AND ENTERTAINMENT/RETAIL TO MIXED USE, WITHIN THE AREA BOUNDED BY FOURTH STREET TO THE NORTH, CONCOURS STREET AND ONTARIO CENTER PARKWAY TO THE SOUTH, VIA ALBA TO THE EAST, AND THE CAMDEN LANDMARK APARTMENTS AND VACANT LAND TO THE WEST; AND, (3) ESTABLISHING DEVELOPMENT STANDARDS AND DESIGN GUIDELINES FOR THE MIXED USE LAND USE AREA OF THE PIEMONTE OVERLAY AT ONTARIO CENTER SPECIFIC PLAN**

RECOMMENDATION: That the City Council consider and adopt Resolutions approving the following:

A. The use of an Addendum to the Ontario Center Environmental Impact Report (State Clearing House No. 89041009); and
B. File No. PSPA21-001, an amendment to the Piemonte Overlay of The Ontario Center Specific Plan: (1) adding approximately 24.9 acres of land to the overlay area; (2) changing the land use designation on approximately 4.9 acres of land from office and entertainment/retail to mixed use; and, (3) establishing development standards and design guidelines for the Mixed Use land use area.

THE FOLLOWING COUNCIL GOALS ARE BEING ACHIEVED:
Invest in the Growth and Evolution of the City's Economy
Operate in a Businesslike Manner
Focus Resources in Ontario's Commercial and Residential Neighborhoods

FISCAL IMPACT: The proposed Specific Plan Amendment will facilitate the future construction of

mixed-use developments consisting of up to a total of 691 residential units and 71,200 square feet of retail space. This subsequent development would result in the one-time collection of Building plan check and permitting fees, development impact fees, as well as on-going property and sales tax.

BACKGROUND & ANALYSIS: In 2006, the City Council approved the creation of the Piemonte Overlay of The Ontario Center Specific Plan ("Piemonte Overlay") within the Urban Commercial land use district of The Ontario Center Specific Plan, establishing a master plan for the development of approximately 1.3 million square feet of retail, office, hotel, and entertainment uses, and more than 800 multiple-family dwelling units on the 84-acre Project site. The Piemonte Overlay was delineated into fifteen subareas and assigned the land use designations of Commercial, Entertainment/Retail, Office, Special Use, or Residential (see Exhibit C, Existing Boundary and Land Use Map, attached). The current Overlay area covers approximately 92 acres of land, with at least 48 acres being vacant land.

Since its original approval, the Piemonte Overlay document was amended in 2017 (File No. PSPA16-003), reducing the maximum allowed number of residential units and hotel rooms, designate plaza areas to accommodate outdoor events, and expand the design concept from the original Tuscan-influenced architecture, allowing more contemporary architectural design concepts. The Piemonte Overlay document was once again amended in 2020 (File No. PSPA19-009), allowing required residential parking spaces to be provided as tandem parking spaces.

The City of Ontario Economic Development Department and a land developer are coordinating to bring a mixed-use development adjacent to the Toyota Arena. The proposed Amendment to the Piemonte Overlay would help facilitate the development of underutilized parking areas around the Toyota Arena, along with vacant parcels throughout the Piemonte Overlay area, allowing for the development of up to 691 residential units and 71,200 square feet of retail space in a vertical mixed-use configuration (first floor retail with residential units on upper floors).

Specific Plan Amendment - The proposed amendment to the Piemonte Overlay of the Ontario Center Specific Plan ("Overlay Amendment") is focused on incorporating more opportunities for vibrant, mixed-use developments that allow for entertainment, dining and housing. The Overlay Amendment would expand the Project boundary, revise the Entertainment/Retail land use designation to Mixed-Use, establish new development standards and guidelines for mixed-use developments, and implement associated minor text amendments. The proposed boundary and land use plan are provided in Exhibit D, Proposed Boundary and Land Use Map, attached.

A. Overlay Boundary Expansion - The Piemonte Overlay boundary would be expanded to include the property located at 4000 Ontario Center Parkway, which is developed with the Toyota Arena sports and entertainment venue and surrounding parking lots. This additional land area is comprised of 24.9 acres of land, which would be delineated into four new subareas and designated with the Mixed-Use land use. The new proposed Subareas ("SA") include SA16, SA17, SA18, and SA19 (see Exhibit D, Existing and Proposed Subareas, attached). SA18 is developed with the Toyota Arena building and the other three areas are developed with parking lots. The Overlay Amendment anticipates that SA16 and SA17 will be developed with service commercial uses on the ground floor and multiple-family residential

complexes on the upper floors.

B. Land Use Plan / Mixed-use Land Use - In addition to expanding the Piemonte Overlay boundary, the areas currently designated as Entertainment/Retail would be recategorized as Mixed-Use, which would allow for residential uses in addition to commercial uses. It is anticipated that SA8 and SA11 (see Exhibit E, Existing and Proposed Subareas, attached) will be developed with ground floor retail and residential units above. The incorporation of residential uses into these areas introduces a use not previously anticipated and requires analysis of potential impacts to infrastructure and services. Therefore, an Addendum to The Ontario Center Specific Plan Environmental Impact Report (State Clearinghouse No. 1989041009) was prepared and is further discussed in the Environmental Review section of this report. The Addendum analyzes the future development of the 691 residential units and 71,200 square feet of retail space proposed by the Specific Plan Amendment. The development review for the residential and retail uses will be considered with future Development Plan applications.

   Land use revisions proposed in the Overlay Amendment involve changing areas currently designated as Entertainment/Retail, to Mixed-Use. The revision affects Subareas 8 and 11, as well as new Subareas 16, 17, 18, and 19. The Mixed-Use land use designation allows for residential, entertainment, retail, dining, and other commercial uses.

C. Development Standards and Guidelines - The Overlay Amendment will establish development standards and guidelines for the Mixed-Use areas, which address site and building designs that can successfully blend residential and commercial uses with pedestrian oriented spaces, providing opportunities for service commercial uses within proximity to residential uses and a large entertainment venue.

   The Overlay Amendment incorporates various standards and guidelines that address elements such as site plan design, building design, building materials, parking structures, plaza areas, signage, residential open spaces, and parking requirements.

   The development standards for Mixed-Use areas require 15-foot building setbacks along the private streets, as measured from the curb face, to allow for pedestrian oriented corridors. The setback requirements, however, do allow flexibility along Via Piemonte in that the building setbacks can be as little as 5 feet from curb face if an average 15-foot setback is provided along the building frontage. The setback flexibility along Via Piemonte will allow variations in building facades and footprint in order to create pedestrian spaces that are ideal for outdoor activities such as dining, people watching, and shopping.

   Development standards for Mixed-Use areas include requirements for private and common open space for residential developments, mandating a minimum 50 square feet of private open space per dwelling unit and a minimum 150 square feet of common open space per dwelling unit.

   The design guidelines address design goals for mixed-use developments. The Contemporary architectural style, for instance, can give architects and designers flexibility and creative leeway to design a truly unique and successful mixed-use project that can accommodate residential living, entertainment and dining experiences, and opportunities for retail businesses.

   The Overlay Amendment includes the addition of design guidelines for parking structures in anticipation of future parking structures to support higher levels of residential and commercial activities than what currently exists. The design guidelines encourage parking structure designs that are compatible with surrounding buildings, aesthetically pleasing, safe

for pedestrians, and visually unobtrusive.

Circulation Concept - The overall circulation concept in the Piemonte Overlay remains largely unchanged. The Piemonte Overlay area is accessed from the surrounding public streets: Haven Avenue, Fourth Street, Milliken Avenue, Concours Street and Ontario Center Parkway. Internal circulation is provided through the existing private streets: Via Piemonte, Via Villagio, Via Asti and Via Alba.

The Overlay Amendment envisions that the main retail and mixed-use corridor will be oriented in a north-south direction, along Via Piemonte, instead of the east-west along Via Villagio, as shown in the current Piemonte Overlay concept. The north-south orientation will make Via Piemonte, a private street, the primary north access point from Fourth Street and will terminate at Ontario Center Parkway to the south. A pedestrian corridor along Via Piemonte will continue south of Ontario Center Parkway as a pedestrian-only area that connects to the Toyota Arena, future service commercial uses, and residential uses.

The Circulation Concept, including the street plans and sections shown as figures in the Overlay Amendment, are considered conceptual in nature. The final street designs may have minor variations from these figures as development plan applications and designs are refined.

Landscape and Streetscape Concept - The landscape and streetscape design guidelines have been revised to reflect new streetscape requirements along the internal private streets. Primarily, the Via Piemonte streetscape design was revised to be the main pedestrian and passenger vehicle corridor for the mixed-use development, incorporating curb-adjacent parkway landscape areas and wider pedestrian walkways.

Streetscape designs along Fourth Street, Concours Street, and Ontario Center Parkway remain largely unchanged, with the exception of a new drop-off and pick-up zone located on the south side of Ontario Center Parkway, at the Via Piemonte intersection, and just north of the Toyota Arena building. This new drop-off and pick-up zone would allow for taxi or car-service drop-off and pick-up, providing a convenient arrival/departure point for visitors to the mixed-use areas and the Toyota Arena.

Infrastructure and Services - The proposed Overlay Amendment does not propose specific changes in the infrastructure and services in relation to the Mixed-Use land use designation. As part of the development plan review process, infrastructure demand and capacity of future projects will be analyzed during the entitlement process. Specific requirements in infrastructure sizing, location, etc., will be addressed in the development project design and conditions of approval.

Signage - The Piemonte Overlay requires that development projects prepare a Master Sign Program for the development prior to installing any identification or business signage. In addition to the current sign requirements and guidelines in the Piemonte Overlay, the proposed Overlay Amendment includes a section on Digital Advertising Signs that would limit such signs to the pedestrian corridor area east of the Toyota Arena building.

HOUSING ELEMENT COMPLIANCE: The Project is consistent with the Housing Element of the

Policy Plan (General Plan) component of The Ontario Plan. The Project site contains four properties listed in the Available Land Inventory contained in Table A-3 (Available Land by Planning Area) of the Housing Element Technical Report Appendix. The proposed changes affect two of the four properties listed in the Available Land Inventory (Subareas 8 and 11; Map ID No. 124 and 125). The residential capacity proposed in this Project is consistent with the number of dwelling units (198) and density (48 DU/AC) specified in the Available Land Inventory.

AIRPORT LAND USE COMPATIBILITY PLAN (ALUCP) COMPLIANCE: The California State Aeronautics Act (Public Utilities Code Section 21670 et seq.) requires that an Airport Land Use Compatibility Plan be prepared for all public use airports in the State; and requires that local land use plans and individual development proposals must be consistent with the policies set forth in the adopted Airport Land Use Compatibility Plan. On April 19, 2011, the City Council of the City of Ontario approved and adopted the Ontario International Airport Land use Compatibility Plan, establishing the Airport Influence Area for Ontario International Airport, which encompasses lands within parts of San Bernardino, Riverside, and Los Angeles Counties, and limits future land uses and development within the Airport Influence Area, as they relate to noise, safety, airspace protection, and overflight impacts of current and future airport activity. The proposed Project is located within the Airport Influence Area of Ontario International Airport and was evaluated and found to be consistent with the policies and criteria of the Ontario International Airport Land use Compatibility Plan.

ENVIRONMENTAL REVIEW: In 1980, the City Council certified The Ontario Center Specific Plan Environmental Impact Report (State Clearing House No. 80062538), in relation to the adoption of The Ontario Center Specific Plan (File No. 2254-SP), which was adopted in 1981. Over the years, several amendments to the Ontario Center Specific Plan have been approved along with appropriate environmental review. On March 19, 1991, a subsequent EIR (State Clearing House No. 89041009) ("Certified EIR") was certified in association with an amendment to The Ontario Center Specific Plan (File No. 4059-SPA). In 2016, the City approved a Mitigated Negative Declaration in association with an amendment to the Piemonte Overlay (File No. PSPA16-003).

In association with the proposed Overlay Amendment, Staff collaborated with consultant, Kimley-Horn to prepare an Addendum to the Certified EIR, as amended, and found that all potential adverse direct, indirect, and cumulative environmental impacts were thoroughly analyzed and discussed in the Certified EIR, as amended, including, but not limited to potential aesthetic, air quality, greenhouse gas emissions, noise, transportation and tribal cultural resources impacts, and all feasible mitigation has been identified and will be incorporated into the proposed Project. This Project does not contemplate any actions that would require the preparation of a subsequent or supplemental environmental document under State CEQA Guidelines Section 15162 or 15163, as it is consistent with the development scenario identified within the Certified EIR. Furthermore, this Project introduces no new significant environmental impacts and no further environmental review is required. A copy of the Addendum and previous Mitigated Negative Declaration Mitigation Measures table are included as attachments to the environmental action resolution provided with this report.

EXHIBIT A— PROJECT LOCATION MAP

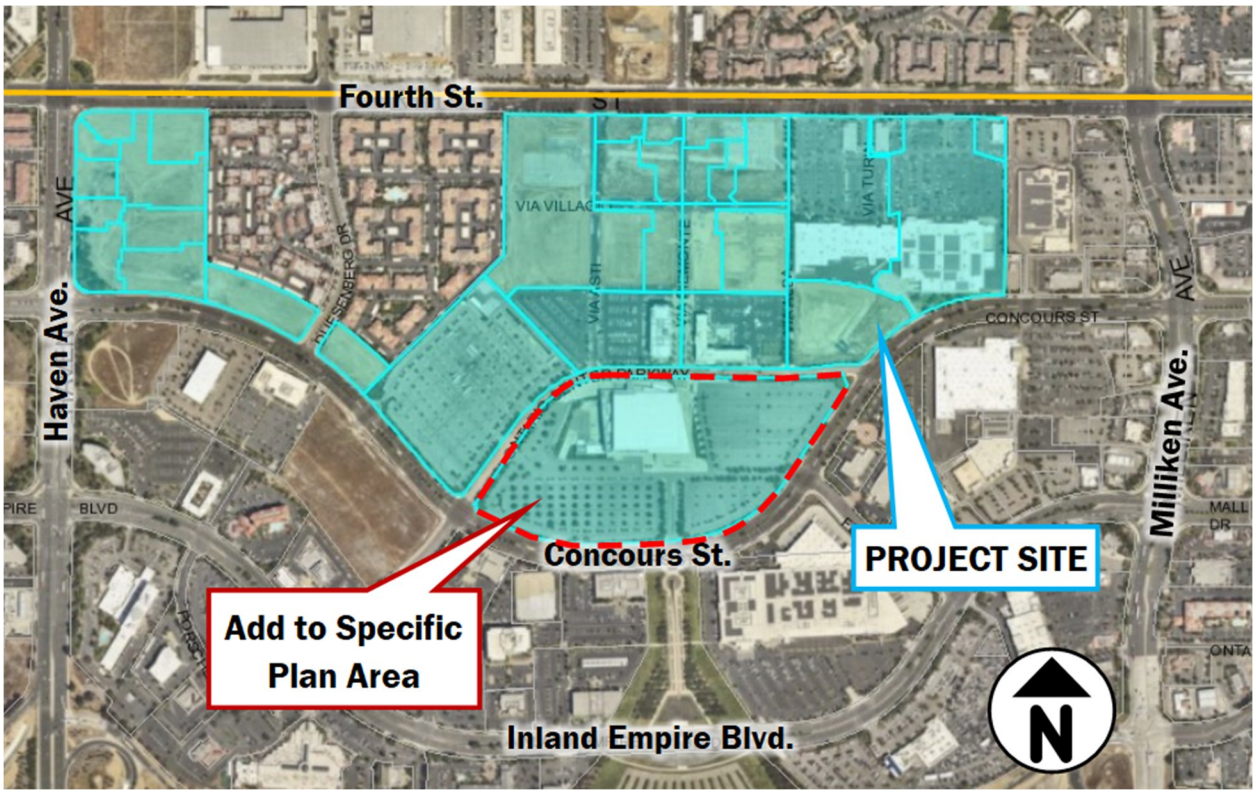
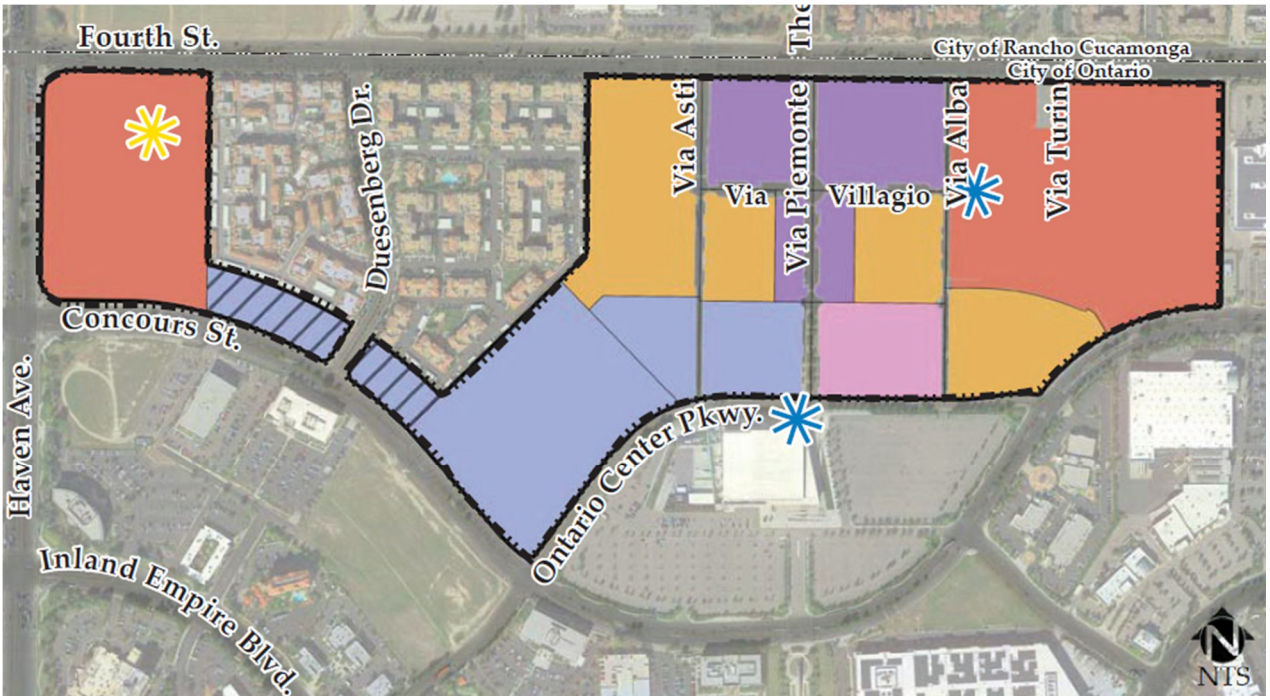


EXHIBIT B— SURROUNDING ZONING AND LAND USE

	Existing Land Use	*General Plan Designation*	*Zoning Designation*	*Specific Plan Land Use*
Site	Office, Commercial, Arena, Hotel, Vacant	Mixed Use	Piemonte Overlay of the Ontario Center Specific Plan	Mixed-use, Office, Residential, Commercial, Special Use
North	Industrial, Office, Commercial, Residential, Vacant (City of Rancho Cucamonga)	Industrial Park, Mixed Use, Open Space (City of Rancho Cucamonga)	Industrial Park, Mixed-use Retail, IASP Sub-Area 18 Specific Plan (City of Rancho Cucamonga)	Mixed Use, Village Neighborhood
South	Office, Commercial, Vacant	Mixed Use	The Ontario Center Specific Plan	Urban Commercial, Garden Commercial, Open Space
East	Commercial	Mixed Use	The Ontario Center Specific Plan	Urban Commercial
West	Residential, Commercial	High Density Residential, Office Commercial	The Ontario Center Specific Plan	Urban Commercial

EXHIBIT C—EXISTING BOUNDARY AND LAND USE MAP



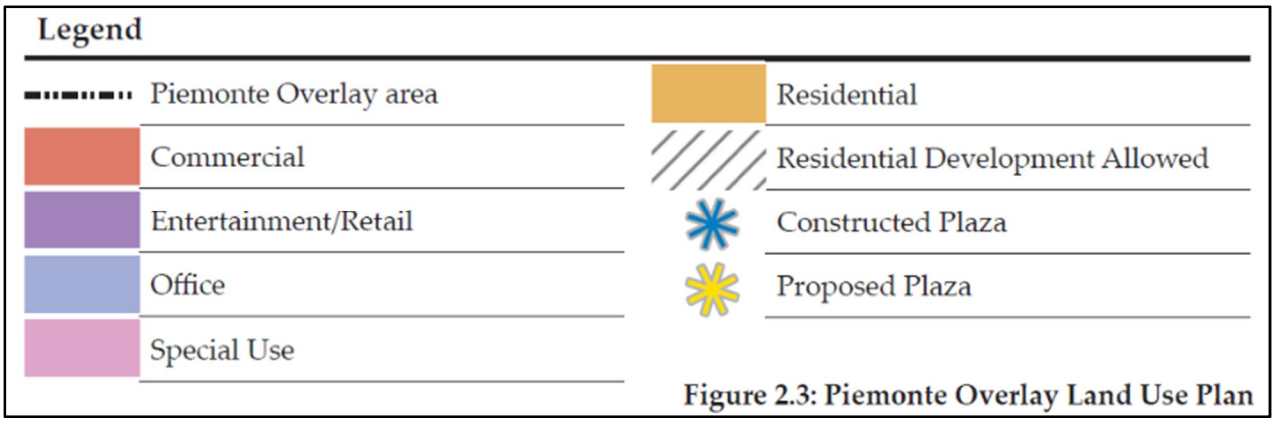
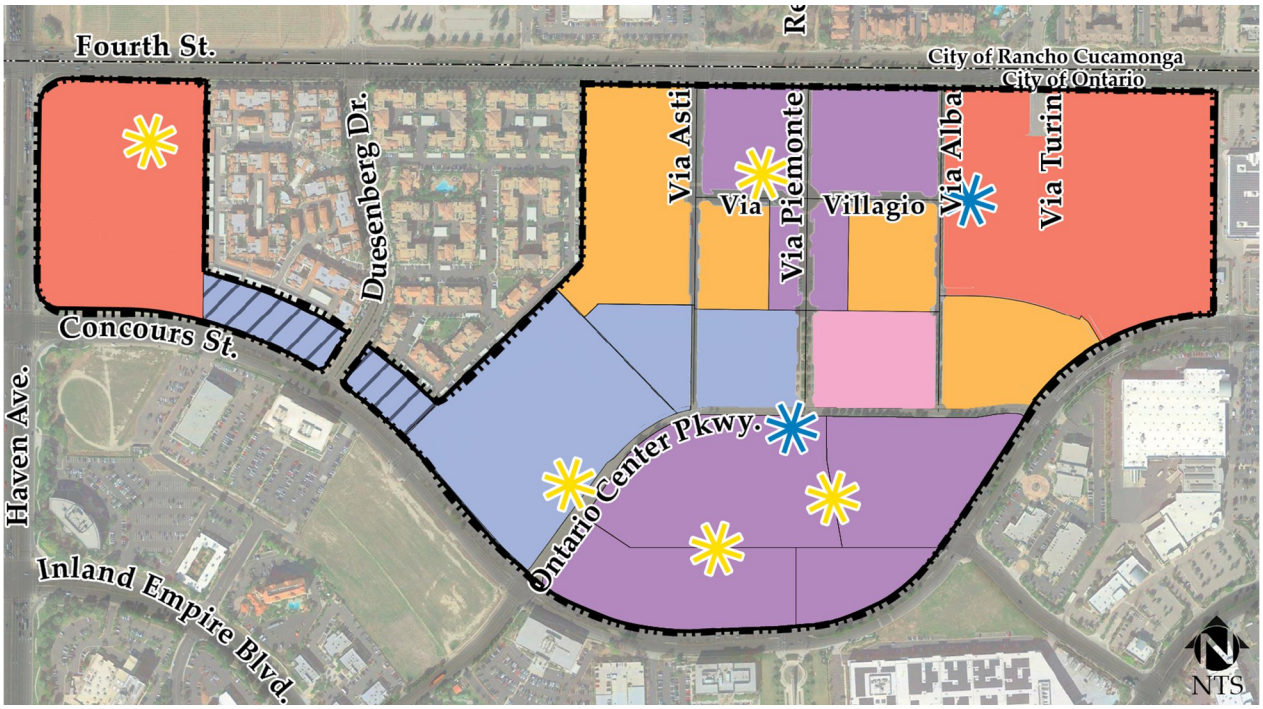


Figure 2.3: Piemonte Overlay Land Use Plan

EXHIBIT D—PROPOSED BOUNDARY AND LAND USE MAP

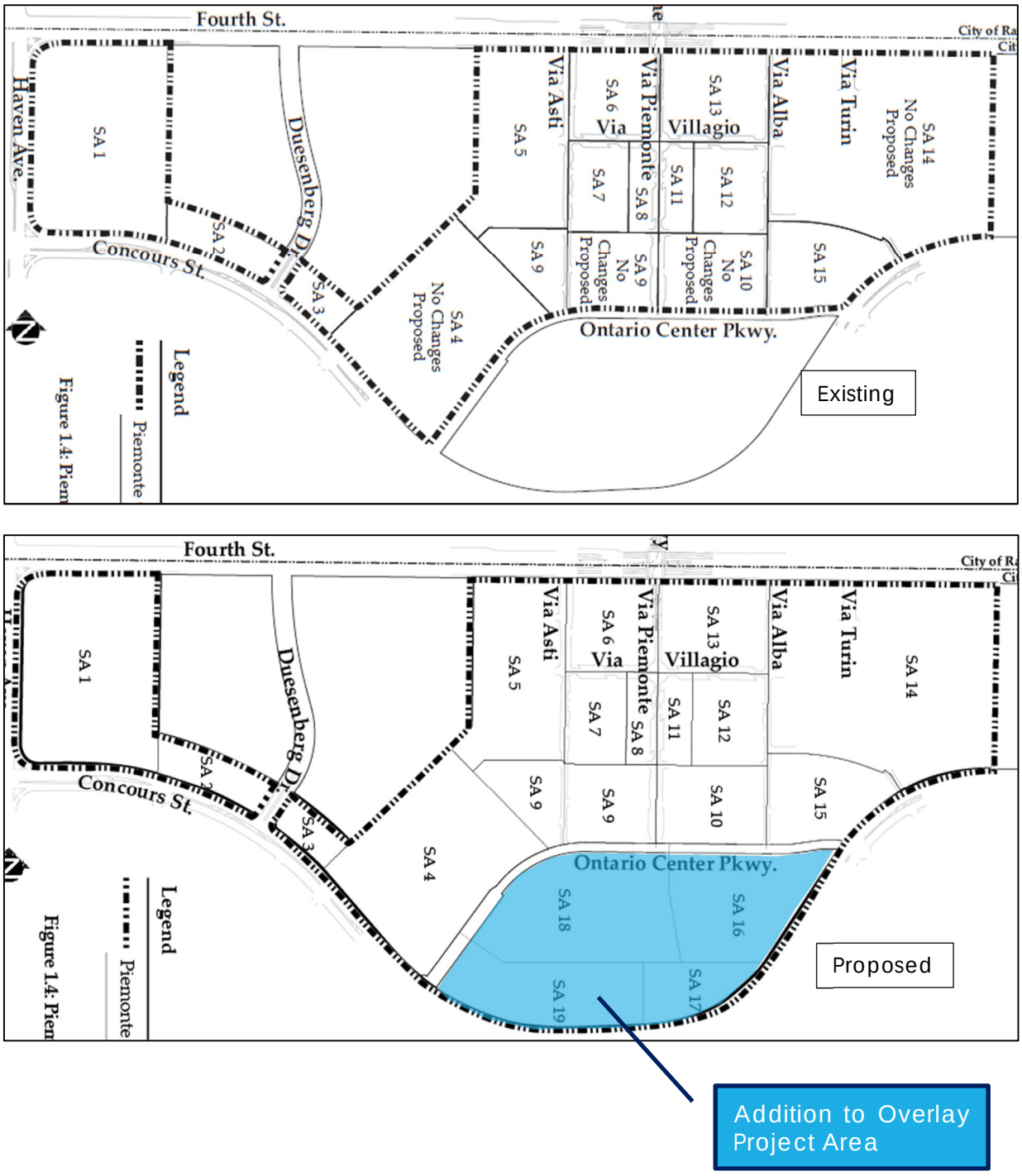


Legend

- Piemonte Overlay area
- Commercial
- Mixed-use
- Office
- Special Use
- Residential
- Residential Development Allowed
- Constructed Plaza
- Proposed Plaza

Figure 2.3: Piemonte Overlay Land Use Plan

EXHIBIT E—EXISTING AND PROPOSED SUBAREAS



CITY OF ONTARIO PLANNING DEPARTMENT

PLANNING COMMISSION STAFF REPORT

March 22, 2022

303 East B Street, Ontario, California 91764 Phone: 909.395.2036 / Fax: 909.395.2420

FILE NO: PSPA21-001

SUBJECT: A public hearing to consider an Amendment to the Piemonte Overlay at Ontario Center Specific Plan, including [1] revising the overlay boundary to add approximately 24.9 acres, comprising of the property located at 4000 Ontario Center Parkway, to the overlay area, [2] changing the land use designation on approximately 4.9 acres of land from Office and Entertainment/Retail to Mixed Use, in an area bounded by Fourth Street to the north, Concours Street and Ontario Center Parkway to the south, Via Alba to the east, and the Camden Landmark Apartment and vacant land to the west, and [3] establishing development standards and design guidelines for the Mixed Use land use area within the Piemonte Overlay at Ontario Center Specific Plan; (APN(s): 0210-204-12, 0210-204-13, 0210-204-14, 0210-204-15, 0210-204-17, 0210-204-18, 0210-204-20, 0210-204-21, 0210-204-22, 0210-204-23, 0210-204-23, 0210-204-24, 0210-204-25, 0210-204-26, 0210-204-28, 0210-204-36, 0210-204-37, 0210-204-37, 0210-204-38, 0210-204-39, 0210-204-40, 0210-204-41, 0210-531-06, 0210-531-07, 0210-531-08, 0210-531-09, 0210-531-10, 0210-231-11, 0210-231-12, 0210-231-13, 0210-231-14, 0210-231-15, 0210-231-16, and 0210-205-01). **City initiated. City Council action required.**

PROPERTY OWNERS: Lewis Piemonte Land LLC; San Juan Owners LLC; Piemonte on 4th LLC; SL & C Ontario LLC; SMG; LCD Residential at Ontario, LLC; Dekalb Properties LLC; Target Corporation; Ontario Covenant Group LLC; City of Ontario

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RECOMMENDED ACTION: That the Planning Commission consider and recommend that the City Council approve the use of an Addendum to The Ontario Center Environmental Impact Report (State Clearing House No. 89041009) and approve the amendment to the Piemonte Overlay at The Ontario Center Specific Plan (File No. PSPA21-001), pursuant to the facts and reasons contained in the staff report and attached resolutions.

PROJECT SETTING: The Project site is comprised of 119.8 acres of land located at the northerly boundary of the City of Ontario, south of Fourth Street, east of Haven Avenue, west of Milliken Avenue, and north of Concours Street, within the Piemonte Overlay at The Ontario Center Specific Plan and The Ontario Center Specific Plan zoning districts, and is depicted in Figure 1: Project Location, below. The Project site is surrounded by residential, office, and commercial properties on land that is generally topographically flat. In addition to the existing surrounding developments, there are also vacant parcels along the Project boundary. The existing surrounding land uses, zoning, and general plan

Case Planner:	Edmelynne V. Hutter, AICP
Planning Director Approval:	
Submittal Date:	N/A

Hearing Body	*Date*	*Decision*	*Action*
DAB	N/A	N/A	N/A
PC	3/22/2022		Recommend
CC	TBD		Final

and specific plan land use designations are summarized in the "Surrounding Zoning & Land Uses" table located in the Technical Appendix of this report.

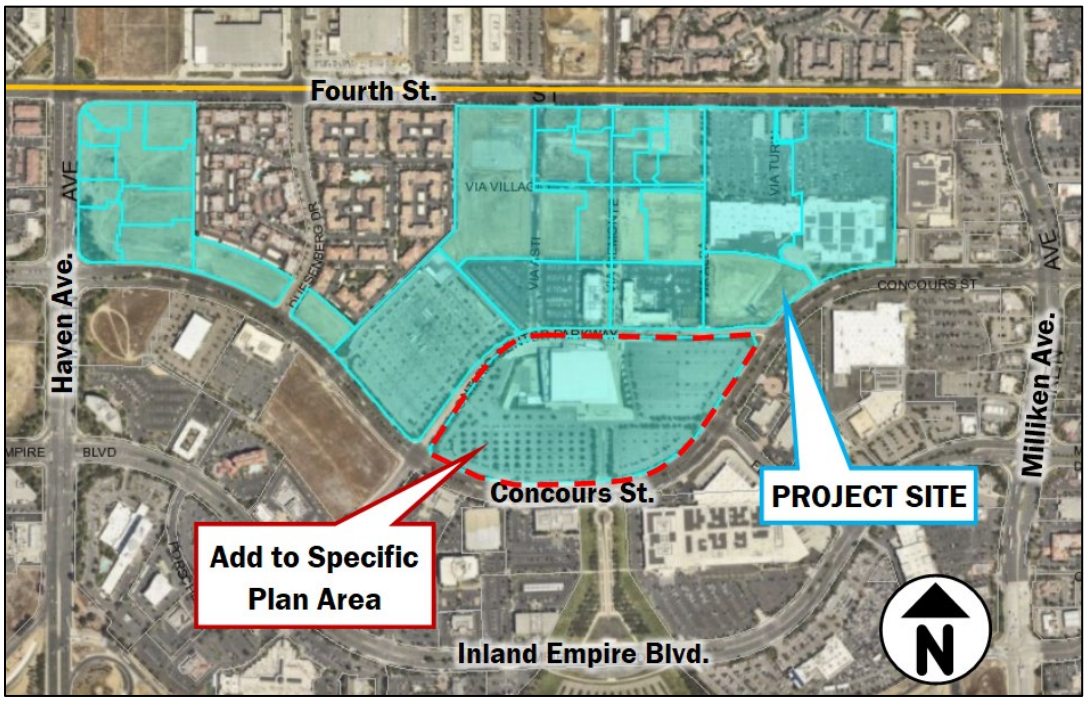


Figure 1: Project Location

PROJECT ANALYSIS:

(1) Background — In 2006, the City Council approved the creation of the Piemonte Overlay at The Ontario Center Specific Plan ("Piemonte Overlay") within the Urban Commercial land use district of The Ontario Center Specific Plan, establishing a master plan for the development of approximately 1.3 million square feet of retail, office, hotel, and entertainment uses, and more than 800 multiple-family dwelling units on the 84-acre Project site. The Piemonte Overlay was delineated into fifteen subareas, with land use designations of Commercial, Entertainment/Retail, Office, Special Use and Residential (See Exhibit B, Existing Boundary and Land Use Map, attached). The current Overlay area covers approximately 92 acres of land, with at least 48 acres being vacant land.

In 2017, the City Council approved an amendment to the Piemonte Overlay document (File No. PSPA16-003) to reduce the number of residential units, reduce the maximum number of hotel rooms, designate plaza areas to accommodate outdoor events, and expand the design concept from the original Tuscan-influenced architecture to allow more contemporary architectural design concepts.

In 2020, the City Council approved an amendment to the Piemonte Overlay document (File No. PSPA19-009) to allow required residential parking spaces to be provided as tandem parking spaces.

The City of Ontario Economic Development Department and a land developer are coordinating to bring a mixed-use development adjacent to the Toyota Arena. The proposed Amendment to the Piemonte Overlay of the Ontario Center Specific Plan would help facilitate the development of underutilized and vacant parcels.

(2) Specific Plan Amendment — The proposed Amendment to the Piemonte Overlay at the Ontario Center Specific Plan ("Overlay Amendment") is focused on incorporating more opportunities for vibrant, mixed-use developments that allow for entertainment, dining and housing. The Overlay Amendment would expand the Project boundary, revise the Entertainment/Retail land use designation to Mixed-Use, establish new development standards and guidelines for mixed-use developments, and implement associated minor text amendments. The proposed boundary and land use plan are provided in Exhibit C, Proposed Boundary and Land Use Map, attached. A "track-changes" document has been prepared that shows the proposed changes in the Piemonte Overlay at The Ontario Center Specific Plan, which is attached to the Specific Plan Amendment action resolution provided with this report.

(a) *Overlay Boundary Expansion* – The Piemonte Overlay boundary would be expanded to include the property located at 4000 Ontario Center Parkway, which is developed with the Toyota Arena sports and entertainment venue and surrounding parking lots. This additional land area is comprised of 24.9 acres of land, which would be delineated into four new subareas and designated with the Mixed-Use land use. The new proposed Subareas ("SA") include SA16, SA17, SA18, and SA19 (See Exhibit D, Existing and Proposed Subareas, attached). SA18 is developed with the Toyota Arena building and the other three areas are developed with parking lots. The Overlay Amendment anticipates that SA16 and SA17 will be developed with service commercial uses on the ground floor and multiple-family residential complexes on the upper floors.

(b) *Land Use Plan / Mixed-use Land Use* – In addition to expanding the Piemonte Overlay boundary, the areas currently designated as Entertainment/Retail would be recategorized as Mixed-Use, which would allow for residential uses in addition to commercial uses. It is anticipated that SA8 and SA11 (See Exhibit D, Existing and Proposed Subareas, attached) will be developed with ground floor retail and residential units above. The incorporation of residential uses into these areas introduces a use not previously anticipated and requires analysis of potential impacts to infrastructure and services. Therefore, an Addendum to The Ontario Center Specific Plan Environmental Impact Report (State Clearinghouse No. 89041009) was prepared and will be discussed further in this report. In summary, the Addendum analyses the future development of 691 residential units and approximately 71,000 square feet of retail space. The development plan review for the residential and retail uses will be processed in future Development Plan applications.

Land use revisions proposed in the Overlay Amendment involve changing areas currently designated as Entertainment/Retail, to Mixed-Use. The revision affects Subareas 8 and 11,

as well as new Subareas 16, 17, 18, and 19. The Mixed-Use land use designation allows for residential, entertainment, retail, dining, and other commercial uses.

(c) *Development Standards and Guidelines* – The Overlay Amendment will establish development standards and guidelines for the Mixed-Use areas, which address site and building designs that can successfully blend residential and commercial uses with pedestrian oriented spaces, providing opportunities for service commercial uses within proximity to residential uses and a large entertainment venue.

The Overlay Amendment incorporates various standards and guidelines that address elements such as site plan design, building design, building materials, parking structures, plaza areas, signage, residential open spaces, and parking requirements.

The development standards for Mixed-Use areas require 15-foot building setbacks along the private streets, as measured from the curb face, to allow for pedestrian oriented corridors. The setback requirements, however, do allow flexibility along Via Piemonte in that the building setbacks can be as little as 5 feet from curb face if an average 15-foot setback is provided along the building frontage. The setback flexibility along Via Piemonte will allow variations in building façades and footprint in order to create pedestrian spaces that are ideal for outdoor activities such as dining, people watching, and shopping.

Development standards for Mixed-Use areas include requirements for private and common open space for residential developments, mandating a minimum 50 square feet of private open space per dwelling unit and a minimum 150 square feet per dwelling unit for common open space.

The design guidelines address design goals for mixed-use developments. The Contemporary architectural style, for instance, can give architects and designers flexibility and creative leeway to design a truly unique and successful mixed-use project that can accommodate residential living, entertainment and dining experiences, and opportunities for retail businesses.

The Overlay Amendment includes the addition of design guidelines for parking structures in anticipation of future parking structures to support higher levels of residential and commercial activities than what currently exists. The design guidelines encourage parking structure designs that are compatible with surrounding buildings, aesthetically pleasing, safe for pedestrians, and visually unobtrusive.

(3) Circulation Concept — The overall circulation concept in the Piemonte Overlay remains largely unchanged. The Piemonte Overlay area is accessed from the surrounding public streets: Haven Avenue, Fourth Street, Milliken Avenue, Concours Street and Ontario Center Parkway. Internal circulation is provided through the existing private streets: Via Piemonte, Via Villagio, Via Asti and Via Alba.

The Overlay Amendment envisions that the main retail and mixed-use corridor will be oriented in a north-south direction, along Via Piemonte, instead of the east-west Via Villagio, as shown in the current Piemonte Overlay concept. The north-south orientation will make Via Piemonte, a private street, as the primary north access point from Fourth Street and will terminate at Ontario Center Parkway to the south. A pedestrian corridor along Via Piemonte will continue south of Ontario Center Parkway as a pedestrian-only area that connects to the Toyota Arena, future service commercial uses, and residential uses.

The Circulation Concept, including the street plans and sections shown as Figures in the Overlay Amendment, are considered conceptual in nature and final street designs may have minor variations from these Figures as development plan applications and designs are refined.

(4) Landscaping — The landscape and streetscape design guidelines have been revised to reflect new streetscape requirements along the internal private streets. Primarily, the Via Piemonte streetscape design was revised to be the main pedestrian and passenger vehicle corridor for the mixed-use development, with curb-adjacent parkway landscape areas and wider pedestrian walkways.

Streetscape designs along Fourth Street, Concours Street, and Ontario Center Parkway remain largely the same, with the exception of a new drop-off and pick-up zone on the south side of Ontario Center Parkway, at the Via Piemonte intersection and just north of the Toyota Arena building. This new zone would allow for taxi or car-service drop-off and pick-up, providing a convenient arrival/departure point for visitors to the mixed-use areas and the Arena.

(5) Infrastructure and Services — The proposed Overlay Amendment does not propose specific changes in the infrastructure and services in relation to the Mixed-use land use designation. As part of the development plan review process, infrastructure demand and capacity of future projects will be analyzed during the planning entitlement process. Specific requirements in infrastructure sizing, location, etc. will be addressed in the development plan design and conditions of approval.

(6) Signage — The Piemonte Overlay requires that development projects prepare a Master Sign Program for the development prior to installing any identification or business signage. In addition to the current sign requirements and guidelines in the Piemonte Overlay, the proposed Overlay Amendment includes a section on Digital Advertising Signs and would limit such signs to the pedestrian corridor area east of the Arena building.

COMPLIANCE WITH THE ONTARIO PLAN: The proposed Project is consistent with the principles, goals and policies contained within the Vision, Governance, Policy Plan (General Plan), and City Council Priorities components of The Ontario Plan (TOP). More specifically, the goals and policies of TOP that are furthered by the proposed Project are as follows:

(1) City Council Goals.

- Invest in the Growth and Evolution of the City's Economy
- Operate in a Businesslike Manner
- Focus Resources in Ontario's Commercial and Residential Neighborhoods

(2) Vision.

Distinctive Development:

- Commercial and Residential Development

➢ Development quality that is broadly recognized as distinctive and not exclusively tied to the general suburban character typical of much of Southern California.

(3) Governance.

Decision Making:

- Goal G1: Sustained decision-making that consistently moves Ontario towards its Vision by using The Ontario Plan as a framework for assessing choices.

➢ G1-2 Long-term Benefit. We require decisions to demonstrate and document how they add value to the community and support the Ontario Vision

(4) Policy Plan (General Plan)

Land Use Element:

- Goal LU1: A community that has a spectrum of housing types and price ranges that match the jobs in the City and that make it possible for people to live and work in Ontario and maintain a quality of life.

➢ LU1-1 Strategic Growth. We concentrate growth in strategic locations that help create place and identity, maximize available and planned infrastructure, and foster the development of transit.

➢ LU1-6 Complete Community: We incorporate a variety of land uses and building types in our land use planning efforts that result in a complete community where residents at all stages of life, employers, workers and visitors have a wide spectrum of choices of where they can live, work, shop and recreate within Ontario. (Refer to Complete Community Section of Community Economics Element).

- Goal LU2: Compatibility between a wide range of uses.

- LU2-6: Infrastructure Compatibility: We require infrastructure to be aesthetically pleasing and in context with the community character.

- Goal LU3: Staff, regulations and processes that support and allow flexible response to conditions and circumstances in order to achieve the vision.

- LU3-1: Development Standards: We maintain clear development standards which allow flexibility to achieve our Vision.

- LU3-3: Land Use Flexibility: We consider uses not typically permitted within a land use category if doing so improves livability, reduces vehicular trips, creates community gathering places and activity nodes, and helps create identity.

Housing Element:

- Goal H2: Diversity of types of quality housing that are affordable to a range of household income levels, accommodate changing demographics, and support and reinforce the economic sustainability of Ontario.

- H2-3 Ontario Airport Metro Center. We foster a vibrant, urban, intense and highly amenitized community in the Ontario Airport Metro Center Area through a mix of residential, entertainment, retail and office-oriented uses.

- H2-5 Housing Design. We require architectural excellence through adherence to City design guidelines, thoughtful site planning, environmentally sustainable practices and other best practices.

- H2-6 Infill Development. We support the revitalization of neighborhoods through the construction of higher-density residential developments on underutilized residential and commercial sites.

- Goal H3: A City regulatory environment that balances the need for creativity and excellence in residential design, flexibility and predictability in the project approval process, and the provision of an adequate supply and prices of housing.

- H3-2 Flexible Standards. We allow flexibility in the application of residential and mixed-use development standards in order to gain benefits such as exceptional design quality, economic advantages, sustainability, or other benefits that would otherwise be unrealized.

- Goal H5: A full range of housing types and community services that meet the special housing needs for all individuals and families in Ontario, regardless of income level, age or other status.

➢ H5-2 Family Housing. We support the development of larger rental apartments that are appropriate for families with children, including, as feasible, the provision of services, recreation and other amenities.

Community Economics Element:

- Goal CE1: A complete community that provides for all incomes and stages of life.

➢ CE1-6 Diversity of Housing. We collaborate with residents, housing providers and the development community to provide housing opportunities for every stage of life; we plan for a variety of housing types and price points to support our workforce, attract business and foster a balanced community.

- Goal CE2: A City of distinctive neighborhoods, districts, and corridors, where people choose to be.

➢ CE2-1 Development Projects. We require new development and redevelopment to create unique, high-quality places that add value to the community.

➢ CE2-2 Development Review. We require those proposing new development and redevelopment to demonstrate how their projects will create appropriately unique, functional and sustainable places that will compete well with their competition within the region.

➢ CE2-4 Protection of Investment. We require that new development and redevelopment protect existing investment by providing architecture and urban design of equal or greater quality.

➢ CE2-5 Private Maintenance. We require adequate maintenance, upkeep, and investment in private property because proper maintenance on private property protects property values.

Safety Element:

- Goal S1: Minimized risk of injury, loss of life, property damage and economic and social disruption caused by earthquake-induced and other geologic hazards.

➢ S1-1 Implementation of Regulations and Standards. We require that all new habitable structures be designed in accordance with the most recent California Building Code adopted by the City, including provisions regarding lateral forces and grading.

Community Design Element:

- Goal CD1: A dynamic, progressive city containing distinct neighborhoods and commercial districts that foster a positive sense of identity and belonging among residents, visitors, and businesses.

  - CD1-1 City Identity. We take actions that are consistent with the City being a leading urban center in Southern California while recognizing the diverse character of our existing viable neighborhoods.

  - CD1-2 Growth Areas. We require development in growth areas to be distinctive and unique places within which there are cohesive design themes.

- Goal CD2: A high level of design quality resulting in public spaces, streetscapes, and developments that are attractive, safe, functional and distinct.

  - CD2-1 Quality Architecture. We encourage all development projects to convey visual interest and character through:

    - Building volume, massing, and height to provide appropriate scale and proportion;
    - A true architectural style which is carried out in plan, section and elevation through all aspects of the building and site design and appropriate for its setting; and
    - Exterior building materials that are visually interesting, high quality, durable, and appropriate for the architectural style.

  - CD2-2 Neighborhood Design. We create distinct residential neighborhoods that are functional, have a sense of community, emphasize livability and social interaction, and are uniquely identifiable places through such elements as:

    - A pattern of smaller, walkable blocks that promote access, activity and safety;
    - Variable setbacks and parcel sizes to accommodate a diversity of housing types;
    - Traffic calming measures to slow traffic and promote walkability while maintaining acceptable fire protection and traffic flows;
    - Floor plans that encourage views onto the street and de-emphasize the visual and physical dominance of garages (introducing the front porch as the "outdoor living room"), as appropriate; and
    - Landscaped parkways, with sidewalks separated from the curb.

  - CD2-4 Mixed Use, Urban Office and Transit Service Areas. We require mixed use, urban office and transit service areas to be designed and developed as pedestrian oriented "villages" that promote a vibrant, comfortable and functional environment.

- CD2-7 Sustainability. We collaborate with the development community to design and build neighborhoods, streetscapes, sites, outdoor spaces, landscaping and buildings to reduce energy demand through solar orientation, maximum use of natural daylight, passive solar and natural ventilation, building form, mechanical and structural systems, building materials and construction techniques.

- CD2-8 Safe Design. We incorporate defensible space design into new and existing developments to ensure the maximum safe travel and visibility on pathways, corridors, and open space and at building entrances and parking areas by avoiding physically and visually isolated spaces, maintenance of visibility and accessibility, and use of lighting.

- CD2-9 Landscape Design. We encourage durable landscaping materials and designs that enhance the aesthetics of structures, create and define public and private spaces, and provide shade and environmental benefits.

- CD2-10 Surface Parking Areas. We require parking areas visible to or used by the public to be landscaped in an aesthetically pleasing, safe and environmentally sensitive manner. Examples include shade trees, pervious surfaces, urban run-off capture and infiltration, and pedestrian paths to guide users through the parking field.

- CD2-11 Entry Statements. We encourage the inclusion of amenities, signage and landscaping at the entry to neighborhoods, commercial centers, mixed use areas, industrial developments, and public places that reinforce them as uniquely identifiable places.

- CD2-12 Site and Building Signage. We encourage the use of sign programs that utilize complementary materials, colors, and themes. Project signage should be designed to effectively communicate and direct users to various aspects of the development and complement the character of the structures.

- CD2-13 Entitlement Process. We work collaboratively with all stakeholders to ensure a high degree of certainty in the efficient review and timely processing of all development plans and permits.

- Goal CD3: Vibrant urban environments that are organized around intense buildings, pedestrian and transit areas, public plazas, and linkages between and within developments that are conveniently located, visually appealing and safe during all hours.

- CD3-1 Design. We require that pedestrian, vehicular, bicycle and equestrian circulation on both public and private property be coordinated and designed to maximize safety, comfort and aesthetics.

- CD3-2 Connectivity Between Streets, Sidewalks, Walkways and Plazas. We require landscaping and paving be used to optimize visual connectivity between streets, sidewalks, walkways and plazas for pedestrians.

- CD3-3 Building Entrances. We require all building entrances to be accessible and visible from adjacent streets, sidewalks or public open spaces.

- CD3-5 Paving. We require sidewalks and road surfaces to be of a type and quality that contributes to the appearance and utility of streets and public spaces.

- CD3-6 Landscaping. We utilize landscaping to enhance the aesthetics, functionality and sustainability of streetscapes, outdoor spaces and buildings.

- Goal CD5: A sustained level of maintenance and improvement of properties, buildings and infrastructure that protects the property values and encourages additional public and private investments.

- CD5-1 Maintenance of Buildings and Property. We require all public and privately owned buildings and property (including trails and easements) to be properly and consistently maintained.

- CD5-2 Maintenance of Infrastructure. We require the continual maintenance of infrastructure.

HOUSING ELEMENT COMPLIANCE: The Project is consistent with the Housing Element of the Policy Plan (General Plan) component of The Ontario Plan. The Project site contains four properties listed in the Available Land Inventory contained in Table A-3 (Available Land by Planning Area) of the Housing Element Technical Report Appendix. The proposed changes affect two of the four properties listed in the Available Land Inventory (Subareas 8 and 11; Map ID No. 124 and 125). The residential capacity proposed in this Project is consistent with the number of dwelling units (198) and density (48 DU/AC) specified in the Available Land Inventory.

AIRPORT LAND USE COMPATIBILITY PLAN (ALUCP) COMPLIANCE: The California State Aeronautics Act (Public Utilities Code Section 21670 et seq.) requires that an Airport Land Use Compatibility Plan be prepared for all public use airports in the State; and requires that local land use plans and individual development proposals must be consistent with the policies set forth in the adopted Airport Land Use Compatibility Plan. On April 19, 2011, the City Council of the City of Ontario approved and adopted the Ontario International Airport Land use Compatibility Plan ("ALUCP"), establishing the Airport Influence Area for Ontario International Airport, which encompasses lands within parts of San Bernardino, Riverside, and Los Angeles Counties, and limits future land uses and development within the Airport Influence Area, as they relate to noise, safety, airspace protection, and overflight impacts of current and future airport activity. The proposed Project is located

within the Airport Influence Area of Ontario International Airport and was evaluated and found to be consistent with the policies and criteria of the ALUCP.

ENVIRONMENTAL REVIEW: In 1980, the City Council certified The Ontario Center Specific Plan Environmental Impact Report (State Clearing House No. 80062538), in relation to the adoption of The Ontario Center Specific Plan (File No. 2254-SP) ("OCSP"), which was adopted in 1981. Over the years, several amendments to the OCSP have been approved along with appropriate environmental review. On March 19, 1991, a subsequent EIR (State Clearing House No. 89041009) ("Certified EIR") was certified in association with an amendment to the OCSP (File No. 4059-SPA). In 2016, the City approved a Mitigated Negative Declaration ("MND") in association with an amendment to the Piemonte Overlay (File No. PSPA16-003).

In association with the proposed Overlay Amendment, staff collaborated with consultant Kimley-Horn to prepare an Addendum to the Certified EIR, as amended, and found that all potential adverse direct, indirect, and cumulative environmental impacts were thoroughly analyzed and discussed in the Certified EIR, as amended, including, but not limited to potential aesthetic, air quality, greenhouse gas emissions, noise, transportation and tribal cultural resources impacts, and all feasible mitigation has been identified and will be incorporated into the proposed Project. This Project does not contemplate any actions that would require the preparation of a subsequent or supplemental environmental document under State CEQA Guidelines Section 15162 or 15163, as it is consistent with the development scenario identified within the Certified EIR. Furthermore, this Project introduces no new significant environmental impacts and no further environmental review is required. A copy of the Addendum and previous MND Mitigation Measures table are included as attachments to the environmental action resolution provided with this report.

CONDITIONS OF APPROVAL: The Overlay Amendment is City-initiated and no conditions of approval are associated with this Project.

TECHNICAL APPENDIX:

Surrounding Zoning and Land Use:

	Existing Land Use	*General Plan Designation*	*Zoning Designation*	*Specific Plan Land Use*
Site	Office, Commercial, Arena, Hotel, Vacant	Mixed Use	Piemonte Overlay of the Ontario Center Specific Plan	Mixed-use, Office, Residential, Commercial, Special Use
North	Industrial, Office, Commercial, Residential, Vacant (City of Rancho Cucamonga)	Industrial Park, Mixed Use, Open Space (City of Rancho Cucamonga)	Industrial Park, Mixed-use Retail, IASP Sub-Area 18 Specific Plan (City of Rancho Cucamonga)	Mixed Use, Village Neighborhood
South	Office, Commercial, Vacant	Mixed Use	The Ontario Center Specific Plan	Urban Commercial, Garden Commercial, Open Space
East	Commercial	Mixed Use	The Ontario Center Specific Plan	Urban Commercial
West	Residential, Commercial	High Density Residential, Office Commercial	The Ontario Center Specific Plan	Urban Commercial

EXHIBIT A—PROJECT LOCATION MAP

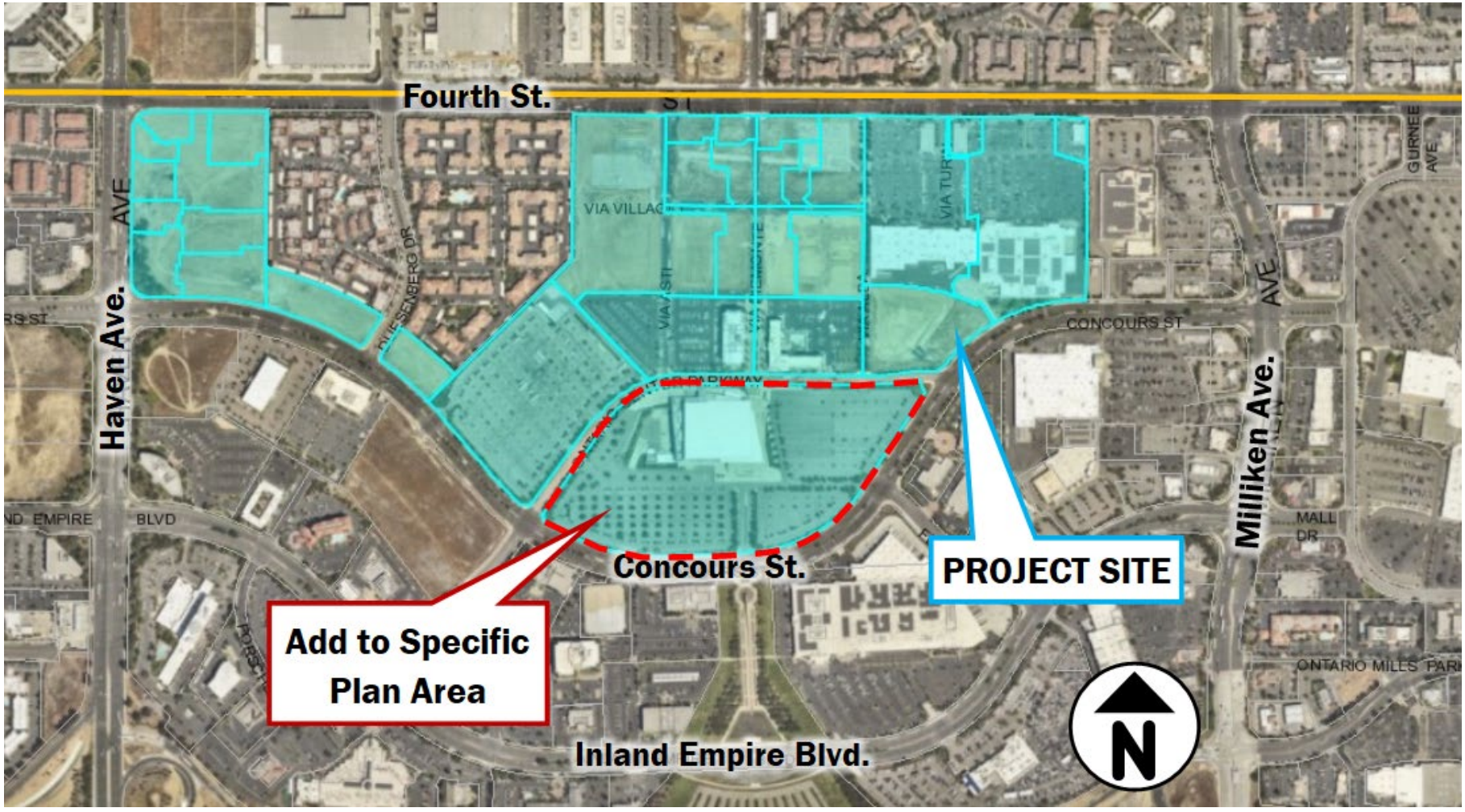


EXHIBIT B—EXISTING BOUNDARY AND LAND USE MAP

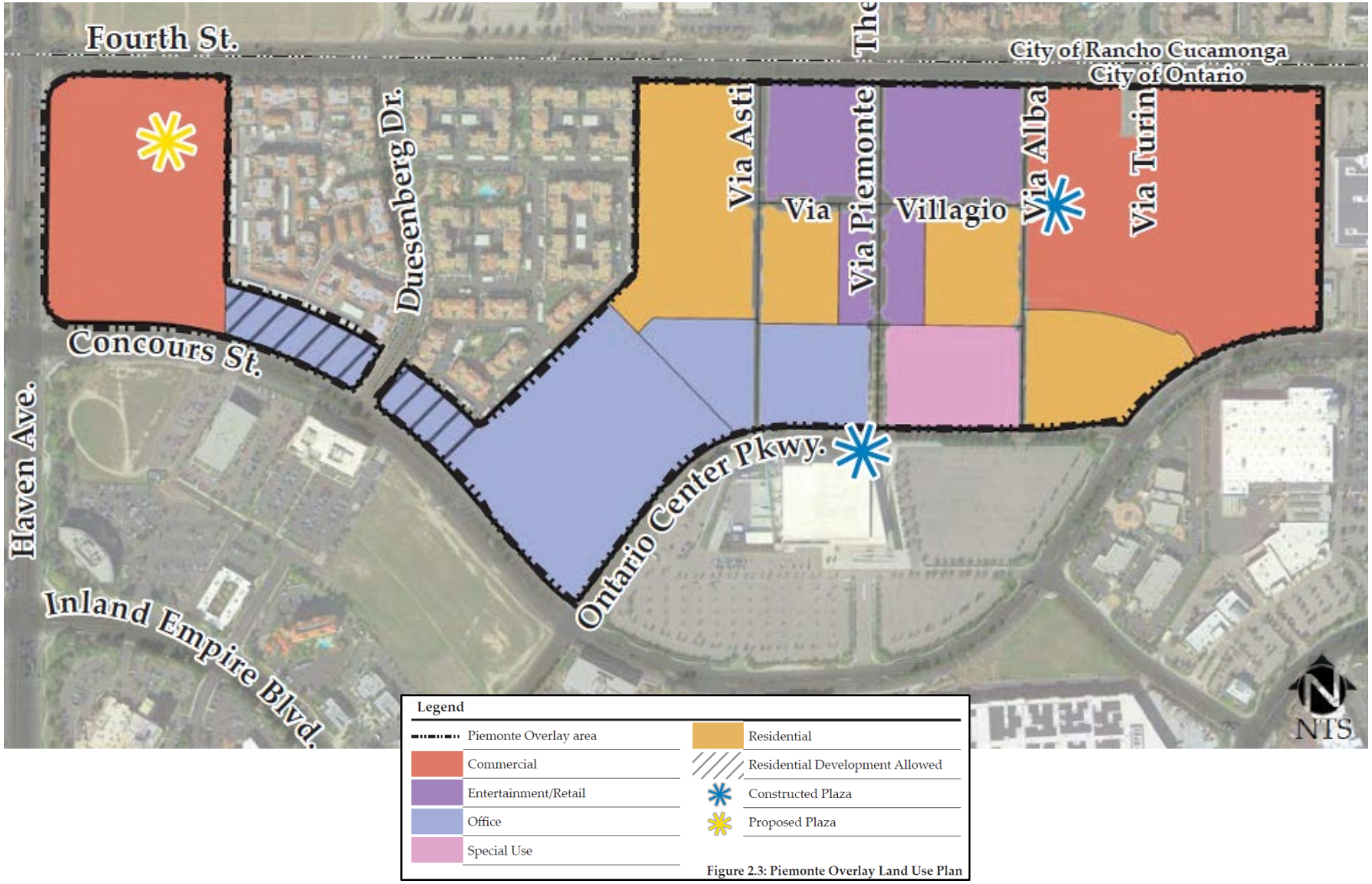


Figure 2.3: Piemonte Overlay Land Use Plan

EXHIBIT C—PROPOSED BOUNDARY AND LAND USE MAP

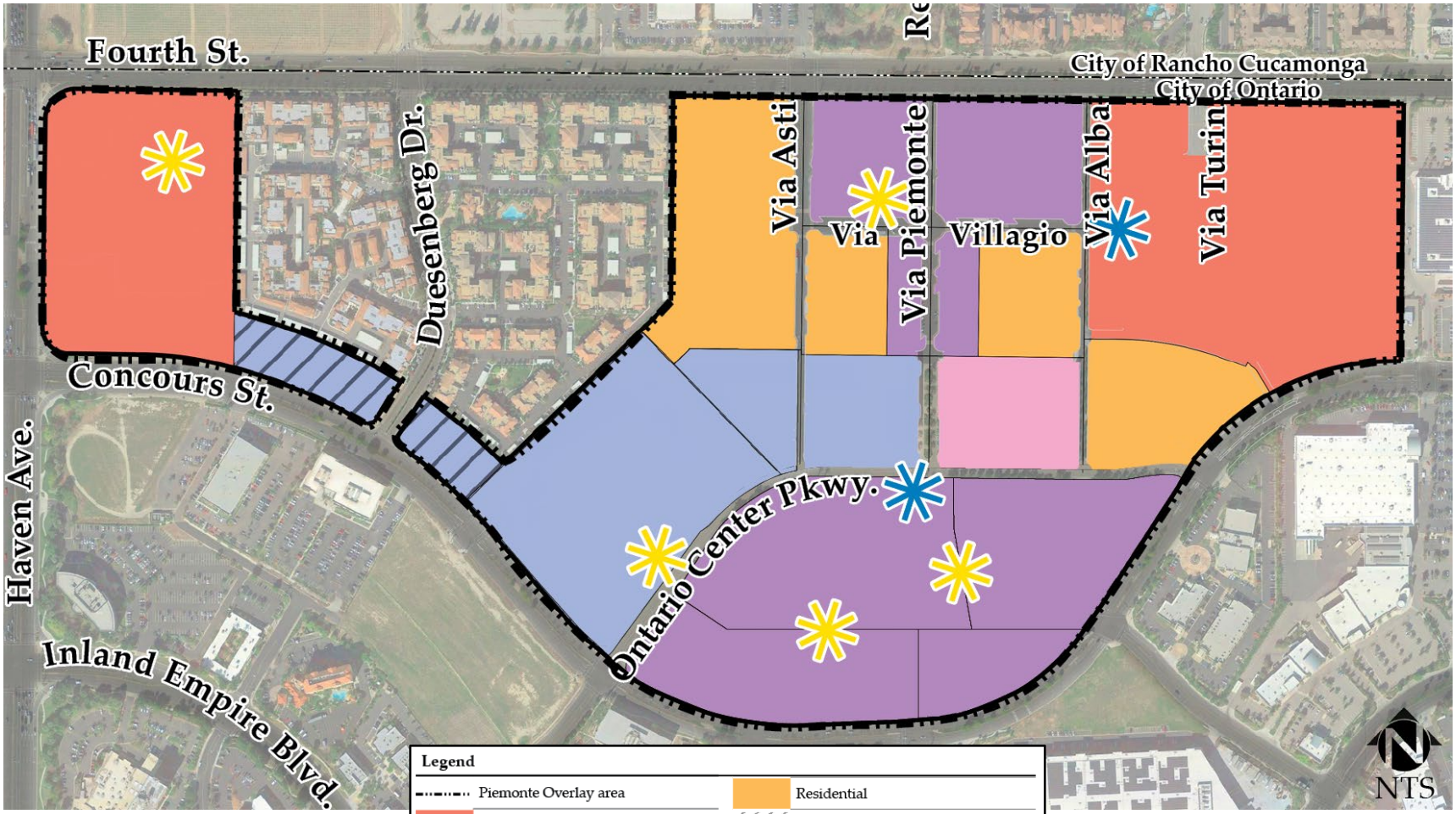
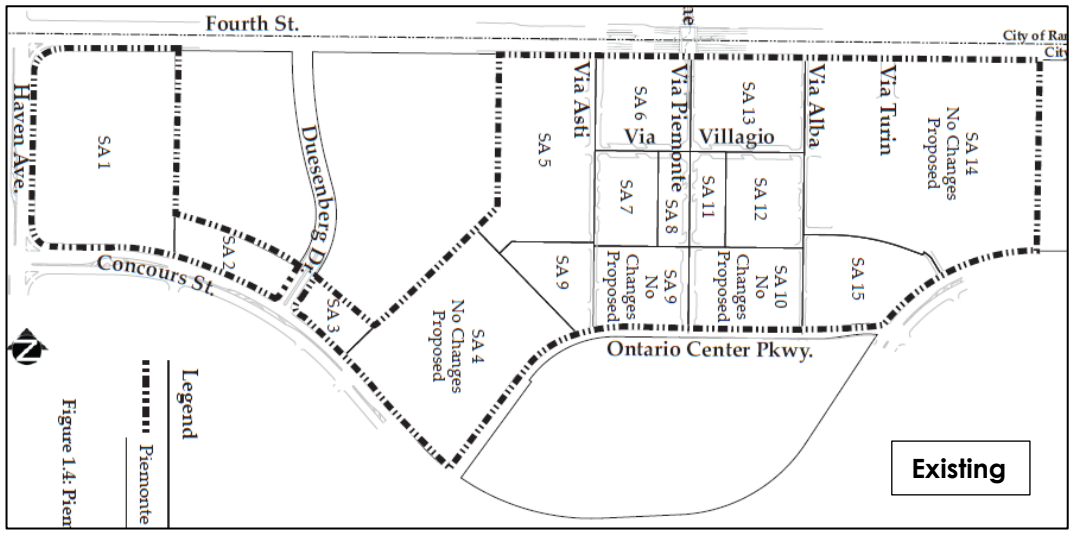
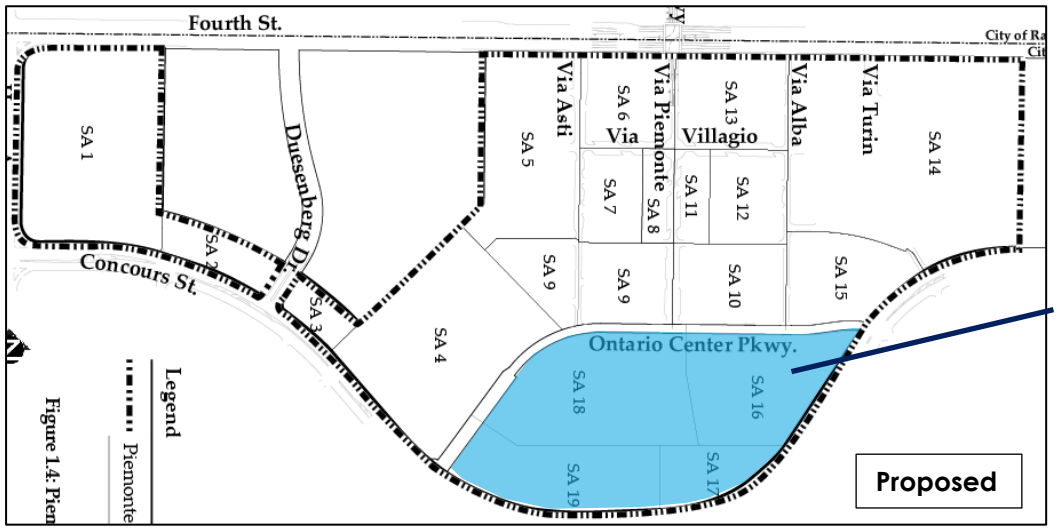


Figure 2.3: Piemonte Overlay Land Use Plan

EXHIBIT D—EXISTING AND PROPOSED SUBAREAS





Addition to Overlay Project Area

RESOLUTION NO. PC22-014

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF ONTARIO APPROVING AN ADDENDUM TO THE ONTARIO CENTER SPECIFIC PLAN ENVIRONMENTAL IMPACT REPORT, PURSUANT TO THE REQUIREMENTS OF THE CALIFORNIA ENVIRONMENTAL QUALITY ACT, AS AMENDED, FOR FILE NO. PSPA21-001.

WHEREAS, the City of Ontario (hereinafter referred to as "City") has initiated a Specific Plan Amendment, File No. PSPA21-001, which consists of an Amendment to the Piemonte Overlay of the Ontario Center Specific Plan, in the City of Ontario, California (hereinafter referred to as "Application" or "Project"); and

WHEREAS, the Ontario Center Specific Plan Environmental Impact Report (State Clearinghouse No. 89041009) was certified on March 19, 1991, (hereinafter referred to as “Certified EIR”), in which development and use of the Project site was discussed in the Amendment to the Ontario Center Specific Plan (File No. 4059-SPA); and

WHEREAS, a Mitigated Negative Declaration was subsequently adopted on May 16, 2017, (hereinafter referred to as “MND”), in which development and use of the Project site was discussed in association with an Amendment to the Ontario Center Specific Plan (File No. PSPA16-003); and

WHEREAS, the Planning Director of the City of Ontario has prepared and approved for attachment to the certified EIR and adopted MND, an Addendum to the Certified EIR and MND (hereinafter collectively referred to as “EIR Addendum”) in accordance with the requirements of the California Environmental Quality Act of 1970, together with State and local guidelines implementing said Act, all as amended to date (collectively referred to as “CEQA”); and

WHEREAS, the EIR Addendum concluded that implementation of the Project could result in a number of significant effects on the environment that were previously analyzed in the Certified EIR and MND, and that the Certified EIR and MND identified mitigation measures that would reduce each of those significant effects to a less-than-significant level; and

WHEREAS, pursuant to State CEQA Guidelines Section 15164(a), a lead agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary to a project, but the preparation of a subsequent or supplemental EIR is not required; and

WHEREAS, pursuant to State CEQA Guidelines Section 15164(b), an addendum to an adopted MND may be prepared if only minor technical changes or additions are necessary but the preparation of a subsequent EIR or MND is not required; and

WHEREAS, the City determined that none of the conditions requiring preparation of a subsequent or supplemental EIR or MND would occur from the Project, and that preparation of an Addendum to the Certified EIR and MND was appropriate; and

WHEREAS, the City of Ontario is the lead agency on the Project, and the Planning Commission is the recommending authority for the requested approval to undertake the Project; and

WHEREAS, the Planning Commission has reviewed and considered the EIR Addendum for the Project, has concluded that none of the conditions requiring preparation of a subsequent of supplemental EIR or MND have occurred, and intends to take actions on the Project in compliance with CEQA and state and local guidelines implementing CEQA; and

WHEREAS, the EIR Addendum for the Project is on file in the Planning Department, located at 303 East B Street, Ontario, CA 91764, is available for inspection by any interested person at that location and are, by this reference, incorporated into this Resolution as if fully set forth herein; and

WHEREAS, all legal prerequisites to the adoption of this Resolution have occurred.

NOW, THEREFORE, IT IS HEREBY FOUND, DETERMINED, AND RESOLVED by the Planning Commission of the City of Ontario, as follows:

SECTION 1: ***Environmental Determination and Findings.*** As the recommending authority for the Project, the Planning Commission has reviewed and considered the information contained in the administrative record for the Project. Based upon the facts and information contained in the administrative record, including all written and oral evidence presented to the Planning Commission, the Planning Commission finds as follows:

(1) The environmental impacts of this project were reviewed in conjunction with an Addendum to the Ontario Center Specific Plan Environmental Impact Report (State Clearinghouse No. 89041009), certified by the Ontario City Council on March 19, 1991, in conjunction with File No. 4059-SPA; and

(2) The environmental impacts of this project were reviewed in conjunction with a Mitigated Negative Declaration, adopted by the Ontario City Council on May 17, 2017, in conjunction with File No. PSPA16-003; and

(3) The EIR Addendum and administrative record have been completed in compliance with CEQA, the State CEQA Guidelines, and the City of Ontario Local CEQA Guidelines; and

(4) The City's "Guidelines for the Implementation of the California Environmental Quality Act (CEQA)" provide for the use of a single environmental assessment in situations where the impacts of subsequent projects are adequately analyzed. This Application introduces no new significant environmental impacts.

(5) All previously adopted mitigation measures shall be a condition of project approval, as they are applicable to the Project, and are incorporated herein by this reference.

(6) The EIR Addendum contains a complete and accurate reporting of the environmental impacts associated with the Project, and reflects the independent judgment of the Planning Commission; and

(7) There is no substantial evidence in the administrative record supporting a fair argument that the project may result in significant environmental impacts.

SECTION 2: ***Additional Environmental Review Not Required.*** Based on the Addendum, all related information presented to the Planning Commission, and the specific findings set forth in Section 1, above, the Planning Commission finds that the preparation of a subsequent or supplemental EIR or MND is not required for the Project, as the Project:

(1) Does not constitute substantial changes to the Certified EIR or MND that will require major revisions to the Certified EIR or MND due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; and

(2) Does not constitute substantial changes with respect to the circumstances under which the Certified EIR or MND were prepared, that will require major revisions to the Certified EIR or MND due to the involvement of new significant environmental effects or a substantial increase in the severity of the previously identified significant effects; and.

(3) Does not contain new information of substantial importance that was not known and could not have been known with the exercise of reasonable diligence at the time the Certified EIR or MND were certified/adopted, that shows any of the following:

(a) The project will have one or more significant effects not discussed in the Certified EIR or MND; or

(b) Significant effects previously examined will be substantially more severe than shown in the Certified EIR or MND; or

(c) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the Project, but the City declined to adopt such measures; or

(d) Mitigation measures or alternatives considerably different from those analyzed in the Certified EIR or MND would substantially reduce one or more significant effects on the environment, but which the City declined to adopt.

SECTION 3: ***Planning Commission Action.*** Based upon the findings and conclusions set forth in Sections 1 and 2, above, the Planning Commission hereby recommends the City Council finds that based upon the entire record of proceedings before it, and all information received, that there is no substantial evidence that the Project will constitute substantial changes to the Certified EIR or MND, and does hereby recommend the City Council approve the use of the EIR Addendum, attached hereto as "Attachment A," and incorporated herein by this reference.

SECTION 4: ***Indemnification.*** The Applicant shall agree to defend, indemnify and hold harmless, the City of Ontario or its agents, officers, and employees from any claim, action or proceeding against the City of Ontario or its agents, officers or employees to attack, set aside, void, or annul this approval. The City of Ontario shall promptly notify the applicant of any such claim, action, or proceeding, and the City of Ontario shall cooperate fully in the defense.

SECTION 5: ***Custodian of Records.*** The documents and materials that constitute the record of proceedings on which these findings have been based are located at the City of Ontario City Hall, 303 East "B" Street, Ontario, California 91764. The custodian for these records is the City Clerk of the City of Ontario.

SECTION 6: ***Certification to Adoption.*** The Secretary shall certify to the adoption of the Resolution.

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The Secretary Pro Tempore for the Planning Commission of the City of Ontario shall certify as to the adoption of this Resolution.

I hereby certify that the foregoing Resolution was duly and regularly introduced, passed and adopted by the Planning Commission of the City of Ontario at a regular meeting thereof held on the 22nd day of March 2022, and the foregoing is a full, true and correct copy of said Resolution, and has not been amended or repealed.

Rick Gage
Planning Commission Chairman

ATTEST:

Rudy Zeledon
Planning Director and
Secretary to the Planning Commission

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, Gwen Berendsen, Secretary Pro Tempore of the Planning Commission of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. PC22-014, was duly passed and adopted by the Planning Commission of the City of Ontario at their regular meeting held on March 22, 2022, by the following roll call vote, to wit:

AYES: Anderson, Dean, DeDiemar, Gage, Willoughby

NOES: None

ABSENT: Lampkin, Ricci

ABSTAIN: None

Gwen Berendsen
Secretary Pro Tempore

RESOLUTION NO. PC22-015

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF ONTARIO, CALIFORNIA, APPROVING FILE NO. PSPA21-001, AN AMENDMENT TO THE PIEMONTE OVERLAY AT THE ONTARIO CENTER SPECIFIC PLAN, [1] REVISING THE OVERLAY BOUNDARY TO ADD APPROXIMATELY 24.9 ACRES, COMPRISING OF THE PROPERTY LOCATED AT 4000 ONTARIO CENTER PARKWAY, TO THE OVERLAY AREA, [2] CHANGING THE LAND USE DESIGNATION ON APPROXIMATELY 4.9 ACRES OF LAND FROM OFFICE AND ENTERTAINMENT/RETAIL TO MIXED USE, IN AN AREA BOUNDED BY FOURTH STREET TO THE NORTH, CONCOURS STREET AND ONTARIO CENTER PARKWAY TO THE SOUTH, VIA ALBA TO THE EAST, AND THE CAMDEN LANDMARK APARTMENTS AND VACANT LAND TO THE WEST, [3] ESTABLISH DEVELOPMENT STANDARDS AND DESIGN GUIDELINES FOR THE MIXED USE LAND USE AREA WITHIN THE PIEMONTE OVERLAY AT ONTARIO CENTER SPECIFIC PLAN, AND MAKING FINDINGS IN SUPPORT THEREOF—APN: 0210-204-12, 0210-204-13, 0210-204-14, 0210-204-15, 0210-204-17, 0210-204-18, 0210-204-20, 0210-204-21, 0210-204-22, 0210-204-23, 0210-204-23, 0210-204-24, 0210-204-25, 0210-204-26, 0210-204-28, 0210-204-36, 0210-204-37, 0210-204-37, 0210-204-38, 0210-204-39, 0210-204-40, 0210-204-41, 0210-531-06, 0210-531-07, 0210-531-08, 0210-531-09, 0210-531-10, 0210-231-11, 0210-231-12, 0210-231-13, 0210-231-14, 0210-231-15, 0210-231-16, 0210-205-01.

WHEREAS, the City of Ontario (hereinafter referred to as "City") has initiated a Specific Plan Amendment, File No. PSPA21-001, which consists of an Amendment to the Piemonte Overlay of the Ontario Center Specific Plan, in the City of Ontario, California (hereinafter referred to as "Application" or "Project"); and

WHEREAS, the Application applies to 119.8 acres of land generally located at the northerly boundary of the City of Ontario, south of Fourth Street, east of Haven Avenue, west of Milliken Avenue, and north of Concours Street, within the Piemonte Overlay at the Ontario Center Specific Plan zoning district, and is presently improved with commercial, office, hotel, Arena, and vacant land; and

WHEREAS, Fourth Street forms the project site’s north boundary and is the corporate boundary dividing the cities of Ontario and Rancho Cucamonga. The properties to the north of the Project site are developed with industrial, residential, and commercial uses. The properties to the east are within the Ontario Center Specific Plan zoning district and is developed with commercial uses. The properties to the south are within the Ontario Center Specific Plan zoning district, and are developed with office, commercial, open space, and vacant land uses. The properties to the west are within the Ontario Center

Specific Plan zoning district, and are developed with residential and commercial uses; and

WHEREAS, on March 23, 2006, City Council adopted Resolution No. 2006-11, approving the creation of the Piemonte Overlay at the Ontario Center Specific Plan within the Urban Commercial land use district of the Ontario Center Specific Plan (File No. PSPA05-003), establishing a master plan for the development of 84 acres of land, which was the former 800-acre Ontario Motor Speedway. The racing facility was completed in 1970 and closed approximately 10 years later. The facility was razed in 1981 and remained vacant until 2006, following the approval of the Piemonte at the Ontario Center Project, which established the Piemonte Overlay, allowing for the development of approximately 1.3 million square feet of retail, office, hotel, and entertainment uses, and more than 800 multiple-family dwelling units on the project site; and

WHEREAS, on May 16, 2017, City Council adopted Resolution No. 2017-041, approving an Amendment to the Piemonte Overlay of the Ontario Center Specific Plan (File No. PSPA16-003) to reduce the development intensity of the project area, designate plaza areas, and expand the design concept to include more contemporary architectural design concepts; and

WHEREAS, on June 2, 2020, City Council adopted Resolution No. 2020-065, approving and Amendment to the Piemonte Overlay at the Ontario Center Specific Plan within the Urban Commercial land use district of the Ontario Center Specific Plan (File No. PSPA19-009) to allow required residential parking to be provided as tandem parking spaces; and

WHEREAS, the Ontario Center Specific Plan Environmental Impact Report (State Clearinghouse No. 89041009) was certified on March 19, 1991 (hereinafter referred to as “Certified EIR”), in which development and use of the Project site was discussed; and

WHEREAS, a Mitigated Negative Declaration was adopted on May 16, 2017, (hereinafter referred to as “MND”), in association with an Amendment to the Ontario Center Specific Plan (File No. PSPA16-003); and

WHEREAS, the Planning Director of the City of Ontario prepared and approved for attachment to the certified EIR and adopted MND, an Addendum to the Certified EIR and MND (hereinafter collectively referred to as “EIR Addendum”) in accordance with the requirements of the California Environmental Quality Act of 1970, together with State and local guidelines implementing said Act, all as amended to date (collectively referred to as “CEQA”); and

WHEREAS, the environmental impacts of this project were thoroughly analyzed in the EIR Addendum, which concluded that implementation of the Project could result in a

number of significant effects on the environment that were previously analyzed in the Certified EIR, and that the Certified EIR identified mitigation measures that would reduce each of those significant effects to a less-than-significant level; and

WHEREAS, the City's "Local Guidelines for the Implementation of the California Environmental Quality Act (CEQA)" provide for the use of a single environmental assessment in situations where the impacts of subsequent projects are adequately analyzed; and

WHEREAS, the Application is a project pursuant to the California Environmental Quality Act — Public Resources Code Section 21000 et seq. — (hereinafter referred to as "CEQA") and an EIR Addendum has been prepared to determine possible environmental impacts; and

WHEREAS, Ontario Development Code Table 2.02-1 (Review Matrix) grants the Planning Commission the responsibility and authority to review and make recommendation to the City Council on the subject Application; and

WHEREAS, the Project has been reviewed for consistency with the Housing Element of the Policy Plan component of The Ontario Plan, as State Housing Element law (as prescribed in Government Code Sections 65580 through 65589.8) requires that development projects must be consistent with the Housing Element, if upon consideration of all its aspects, it is found to further the purposes, principals, goals, and policies of the Housing Element; and

WHEREAS, the Project is located within the Airport Influence Area of Ontario International Airport, which encompasses lands within parts of San Bernardino, Riverside, and Los Angeles Counties, and is subject to, and must be consistent with, the policies and criteria set forth in the Ontario International Airport Land Use Compatibility Plan (hereinafter referred to as “ALUCP”), which applies only to jurisdictions within San Bernardino County, and addresses the noise, safety, airspace protection, and overflight impacts of current and future airport activity; and

WHEREAS, City of Ontario Development Code Division 2.03 (Public Hearings) prescribes the manner in which public notification shall be provided and hearing procedures to be followed, and all such notifications and procedures have been completed; and

WHEREAS, as the first action on the Project, on March 22, 2022, the Planning Commission issued a Resolution recommending the City Council approve the EIR Addendum, finding that the proposed Project introduces no new significant environmental impacts and applying all previously adopted mitigation measures to the Project, which were incorporated by reference; and

WHEREAS, on March 22, 2022, the Planning Commission of the City of Ontario conducted a hearing to consider the Project, and concluded said hearing on that date; and

WHEREAS, all legal prerequisites to the adoption of this Resolution have occurred.

NOW, THEREFORE, IT IS HEREBY FOUND, DETERMINED, AND RESOLVED by the Planning Commission of the City of Ontario, as follows:

SECTION 1: ***Environmental Determination and Findings.*** As the recommending body for the Project, the Planning Commission has reviewed and considered the information contained in the Addendum, the initial study, and the administrative record for the Project, including all written and oral evidence provided during the comment period. Based upon the facts and information contained in the Addendum, the initial study, and the administrative record, including all written and oral evidence presented to the Planning Commission, the Planning Commission finds as follows:

(1) The environmental impacts of the Project were reviewed in conjunction with an Addendum to the Ontario Center Specific Plan Environmental Impact Report (State Clearinghouse No. 89041009), certified by the Ontario City Council on March 19, 1991 in conjunction with File No. 4059-SPA, in combination with an Addendum to the Mitigated Negative Declaration, adopted by the Ontario City Council on May 17, 2017 in conjunction with File No. PSPA16-003; and

(2) The EIR Addendum and administrative record have been completed in compliance with CEQA, the State CEQA Guidelines, and the City of Ontario Local CEQA Guidelines; and

(3) The City's "Guidelines for the Implementation of the California Environmental Quality Act (CEQA)" provide for the use of a single environmental assessment in situations where the impacts of subsequent projects are adequately analyzed. This Application introduces no new significant environmental impacts; and

(4) All previously adopted mitigation measures shall be a condition of project approval, as they are applicable to the Project, and are incorporated herein by this reference; and

(5) The EIR Addendum contains a complete and accurate reporting of the environmental impacts associated with the Project, and reflects the independent judgment of the Planning Commission; and

(6) There is no substantial evidence in the administrative record supporting a fair argument that the project may result in significant environmental impacts.

SECTION 2: ***Subsequent or Supplemental Environmental Review Not Required.*** Based on the EIR Addendum, all related information presented to the Planning Commission, and the specific findings set forth in Section 1, above, the Planning Commission finds that the preparation of a subsequent or supplemental Certified EIR is not required for the Project, as the Project:

(1) Does not constitute substantial changes to the Certified EIR that will require major revisions to the Certified EIR or MND due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; and

(2) Does not constitute substantial changes with respect to the circumstances under which the Certified EIR or MND were prepared, that will require major revisions to the Certified EIR or MND due to the involvement of new significant environmental effects or a substantial increase in the severity of the previously identified significant effects; and.

(3) Does not contain new information of substantial importance that was not known and could not have been known with the exercise of reasonable diligence at the time the Certified EIR or MND were certified/adopted, that shows any of the following:

(a) The Project will have one or more significant effects not discussed in the Certified EIR or MND; or

(b) Significant effects previously examined will be substantially more severe than shown in the Certified EIR or MND; or

(c) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the Project, but the City declined to adopt such measures; or

Mitigation measures or alternatives considerably different from those analyzed in the Certified EIR or MND would substantially reduce one or more significant effects on the environment, but which the City declined to adopt.

SECTION 3: ***Housing Element Compliance.*** Pursuant to the requirements of California Government Code Chapter 3, Article 10.6, commencing with Section 65580, as the recommending body for the Project, the Planning Commission finds that based upon the facts and information contained in the Application and supporting documentation, at the time of Project implementation, the project is consistent with the Housing Element of the Policy Plan (General Plan) component of The Ontario Plan. The project site contains

four properties listed in the Available Land Inventory contained in Table A-3 (Available Land by Planning Area) of the Housing Element Technical Report Appendix. The proposed changes affect two of the four properties listed in the Available Land Inventory (Subareas 8 and 11; Map ID No. 124 and 125). The residential capacity proposed in this Project is consistent with the number of dwelling units (198) and density (48 DU/AC) specified in the Available Land Inventory.

SECTION 4: ***Ontario International Airport Land Use Compatibility Plan ("ALUCP") Compliance.*** The California State Aeronautics Act (Public Utilities Code Section 21670 et seq.) requires that an Airport Land Use Compatibility Plan be prepared for all public use airports in the State; and requires that local land use plans and individual development proposals must be consistent with the policies set forth in the adopted Airport Land Use Compatibility Plan. On April 19, 2011, the City Council of the City of Ontario approved and adopted the ALUCP, establishing the Airport Influence Area for Ontario International Airport (hereinafter referred to as "ONT"), which encompasses lands within parts of San Bernardino, Riverside, and Los Angeles Counties, and limits future land uses and development within the Airport Influence Area, as they relate to noise, safety, airspace protection, and overflight impacts of current and future airport activity. As the recommending authority for the Project, the Planning Commission has reviewed and considered the facts and information contained in the Application and supporting documentation against the ALUCP compatibility factors, including [1] Safety Criteria (ALUCP Table 2-2) and Safety Zones (ALUCP Map 2-2), [2] Noise Criteria (ALUCP Table 2-3) and Noise Impact Zones (ALUCP Map 2-3), [3] Airspace protection Zones (ALUCP Map 2-4), and [4] Overflight Notification Zones (ALUCP Map 2-5). As a result, the PLANNING COMMISSION, therefore, finds and determines that the Project, when implemented in conjunction with the conditions of approval, will be consistent with the policies and criteria set forth within the ALUCP.

SECTION 5: ***Concluding Facts and Reasons.*** Based upon the substantial evidence presented to the Planning Commission during the above-referenced hearing, and upon the specific findings set forth in Sections 1 thru 4, above, the Planning Commission hereby concludes as follows:

(1) ***The proposed Specific Plan, or amendment thereto, is consistent with the goals, policies, plans and exhibits of the Vision, Policy Plan (General Plan), and City Council Priorities components of The Ontario Plan.*** The proposed Specific Plan Amendment is consistent with the Vision, Policy Plan (General Plan), and City Council Priorities components of The Ontario Plan, in that the Specific Plan Amendment contributes toward the legislative framework for the implementation of The Ontario Plan components, guiding growth and development within the project area to achieve optimum results from the City's physical, economic, environmental, and human resources.

(2) ***The proposed Specific Plan, or amendment thereto, would not be detrimental to the public interest, health, safety, convenience, or general welfare of the City.*** The development standards and guidelines established by the proposed Specific Plan Amendment have been created with the intent to safeguard and further the public interest, health, safety, convenience, and/or general welfare, and to ensure that the purposes of The Ontario Plan and the proposed Specific Plan Amendment, are maintained.

(3) ***The proposed Specific Plan Amendment will not adversely affect the harmonious relationship with adjacent properties and land uses.*** The location of the proposed Specific Plan Amendment, and the proposed conditions under which future developments will be constructed and maintained, is consistent with the Policy Plan component of The Ontario Plan and the City's Development Plan, and, therefore, will not adversely affect the harmonious relationship with adjacent properties and land uses.

(4) ***In the case of an application affecting specific properties, the subject site is physically suitable, including, but not limited to, parcel size, shape, access, and availability of utilities, for the request and anticipated development.*** The proposed Specific Plan Amendment has been reviewed by all City departments, which have established that the project site is physically suitable for the anticipated development in terms of parcel size, shape, and availability of utilities.

SECTION 6: ***Planning Commission Action.*** Based upon the findings and conclusions set forth in Sections 1 through 5, above, the Planning Commission hereby RECOMMENDS THE CITY COUNCIL APPROVE the herein described Application.

SECTION 7: ***Indemnification.*** The Applicant shall agree to defend, indemnify and hold harmless, the City of Ontario or its agents, officers, and employees from any claim, action or proceeding against the City of Ontario or its agents, officers or employees to attack, set aside, void, or annul this approval. The City of Ontario shall promptly notify the applicant of any such claim, action, or proceeding, and the City of Ontario shall cooperate fully in the defense.

SECTION 8: ***Custodian of Records.*** The documents and materials that constitute the record of proceedings on which these findings have been based are located at the City of Ontario City Hall, 303 East "B" Street, Ontario, California 91764. The custodian for these records is the City Clerk of the City of Ontario.

SECTION 9: ***Certification to Adoption.*** The Secretary shall certify to the adoption of the Resolution.

- - - - - - - - - - - - - -

The Secretary Pro Tempore for the Planning Commission of the City of Ontario shall certify as to the adoption of this Resolution.

I hereby certify that the foregoing Resolution was duly and regularly introduced, passed and adopted by the Planning Commission of the City of Ontario at a regular meeting thereof held on the 22nd day of March 2022, and the foregoing is a full, true and correct copy of said Resolution, and has not been amended or repealed.

Rick Gage
Planning Commission Chairman

ATTEST:

Rudy Zeledon
Planning Director and
Secretary to the Planning Commission

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, Gwen Berendsen, Secretary Pro Tempore of the Planning Commission of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. PC22-015, was duly passed and adopted by the Planning Commission of the City of Ontario at their regular meeting held on March 22, 2022, by the following roll call vote, to wit:

AYES: Anderson, Dean, DeDiemar, Gage, Willoughby

NOES: None

ABSENT: Lampkin, Ricci

ABSTAIN: None

Gwen Berendsen
Secretary Pro Tempore

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, APPROVING AN ADDENDUM TO THE ONTARIO CENTER SPECIFIC PLAN ENVIRONMENTAL IMPACT REPORT, PURSUANT TO THE REQUIREMENTS OF THE CALIFORNIA ENVIRONMENTAL QUALITY ACT, AS AMENDED, FOR FILE NO PSPA21-001.

WHEREAS, THE CITY OF ONTARIO (hereinafter referred to as "Applicant") has initiated a Specific Plan Amendment, File No. PSPA21-001, which consists of an Amendment to the Piemonte Overlay of the Ontario Center Specific Plan, in the City of Ontario, California (hereinafter referred to as "Application" or "Project"); and

WHEREAS, the Ontario Center Specific Plan Environmental Impact Report (State Clearinghouse No. 89041009) was certified on March 19, 1991, (hereinafter referred to as “Certified EIR”), in which development and use of the Project site was discussed in the Amendment to the Ontario Center Specific Plan (File No. 4059-SPA); and

WHEREAS, a Mitigated Negative Declaration was subsequently adopted on May 16, 2017, (hereinafter referred to as “MND”), in which development and use of the Project site was discussed in associated with an Amendment to the Ontario Center Specific Plan (File No. PSPA16-003); and

WHEREAS, the Planning Director of the City of Ontario has prepared and approved for attachment to the certified Environmental Impact Report, an Addendum to the Certified EIR (hereinafter referred to as “EIR Addendum”) in accordance with the requirements of the California Environmental Quality Act of 1970, together with State and local guidelines implementing said Act, all as amended to date (collectively referred to as “CEQA”); and

WHEREAS, the EIR Addendum concluded that implementation of the Project could result in a number of significant effects on the environment that were previously analyzed in the Certified EIR and MND, and that the Certified EIR and MND identified mitigation measures that would reduce each of those significant effects to a less-than-significant level; and

WHEREAS, pursuant to State CEQA Guidelines Section 15164(a), a lead agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary to a project, but the preparation of a subsequent or supplemental EIR is not required; and

WHEREAS, pursuant to State CEQA Guidelines Section 15164(B), an addendum to an adopted MND may be prepared if only minor technical changes or additions are necessary but the preparation of a subsequent EIR or MND is not required; and

WHEREAS, the City determined that none of the conditions requiring preparation of a subsequent or supplemental EIR or MND would occur from the Project, and that preparation of an Addendum to the Certified EIR and MND was appropriate; and

WHEREAS, on March 22, 2022, the Planning Commission of the City of Ontario conducted a hearing to consider the Addendum and concluded said hearing on that date, voting to issue Resolution No. PC22-014 recommending that the City Council conclude that none of the conditions requiring preparation of a subsequent or supplemental EIR have occurred, and further recommending that the City Council take actions on the Project in compliance with CEQA and state and local guidelines implementing CEQA; and

WHEREAS, the City of Ontario is the lead agency on the Project, and the City Council is the decision-making authority for the requested approval to construct and otherwise undertake the Project; and

WHEREAS, the City Council has reviewed and considered the EIR Addendum for the Project, has concluded that none of the conditions requiring preparation of a subsequent or supplemental EIR or MND have occurred, and intends to take actions on the Project in compliance with CEQA and state and local guidelines implementing CEQA; and

WHEREAS, the EIR Addendum for the Project is on file in the Planning Department, located at 303 East B Street, Ontario, CA 91764, are available for inspection by any interested person at that location and are, by this reference, incorporated into this Resolution as if fully set forth herein; and

WHEREAS, all legal prerequisites to the adoption of this Resolution have occurred.

NOW, THEREFORE, IT IS HEREBY FOUND, DETERMINED, AND RESOLVED by the City Council of the City of Ontario, as follows:

SECTION 1. ***Environmental Determination and Findings.*** As the decision-making authority for the Project, the City Council has reviewed and considered the information contained in the administrative record for the Project. Based upon the facts and information contained in the administrative record, including all written and oral evidence presented to the City Council, the City Council finds as follows:

(1) The environmental impacts of this project were reviewed in conjunction with an Addendum to the Ontario Center Specific Plan Environmental Impact Report (State Clearinghouse No. 89041009), certified by the Ontario City Council on March 19, 1991, in conjunction with File No. 4059-SPA; and

(2) The environmental impacts of this project were reviewed in conjunction with a Mitigated Negative Declaration, adopted by the Ontario City Council on May 17, 2017, in conjunction with File No. PSPA16-003; and

(3) The EIR Addendum and administrative record have been completed in compliance with CEQA, the State CEQA Guidelines, and the City of Ontario Local CEQA Guidelines; and

(4) The City's "Guidelines for the Implementation of the California Environmental Quality Act (CEQA)" provide for the use of a single environmental assessment in situations where the impacts of subsequent projects are adequately analyzed. This Application introduces no new significant environmental impacts; and

(5) All previously adopted mitigation measures shall be a condition of project approval, as they are applicable to the Project, and are incorporated herein by this reference; and

(6) The EIR Addendum contains a complete and accurate reporting of the environmental impacts associated with the Project, and reflects the independent judgment of the City Council; and

(7) There is no substantial evidence in the administrative record supporting a fair argument that the project may result in significant environmental impacts.

SECTION 2. ***Additional Environmental Review Not Required.*** Based on the Addendum, all related information presented to the City Council, and the specific findings set forth in Section 1, above, the City Council finds that the preparation of a subsequent or supplemental Environmental Impact Report is not required for the Project, as the Project:

(1) Does not constitute substantial changes to the Certified EIR or MND that will require major revisions to the Certified EIR or MND due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; and

(2) Does not constitute substantial changes with respect to the circumstances under which the Certified EIR or MND was prepared, that will require major revisions to the Certified EIR or MND due to the involvement of new significant environmental effects or a substantial increase in the severity of the previously identified significant effects; and.

(3) Does not contain new information of substantial importance that was not known and could not have been known with the exercise of reasonable diligence at the time the Certified EIR or MND was certified/adopted, that shows any of the following:

(a) The project will have one or more significant effects not discussed in the Certified EIR or MND; or

(b) Significant effects previously examined will be substantially more severe than shown in the Certified EIR or MND; or

(c) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the Project, but the City declined to adopt such measures; or

(d) Mitigation measures or alternatives considerably different from those analyzed in the Certified EIR or MND would substantially reduce one or more significant effects on the environment, but which the City declined to adopt.

SECTION 3. ***City Council Action.*** Based upon the findings and conclusions set forth in Sections 1 and 2, above, the City Council hereby finds that based upon the entire record of proceedings before it, and all information received, that there is no substantial evidence that the Project will constitute substantial changes to the Certified EIR, and does hereby approve the EIR Addendum, attached hereto as "Attachment A," and incorporated herein by this reference.

SECTION 4. ***Indemnification.*** The Applicant shall agree to defend, indemnify and hold harmless, the City of Ontario or its agents, officers, and employees from any claim, action or proceeding against the City of Ontario or its agents, officers or employees to attack, set aside, void, or annul this approval. The City of Ontario shall promptly notify the applicant of any such claim, action, or proceeding, and the City of Ontario shall cooperate fully in the defense.

SECTION 5. ***Custodian of Records.*** The documents and materials that constitute the record of proceedings on which these findings have been based are located at the City of Ontario City Hall, 303 East "B" Street, Ontario, California 91764. The custodian for these records is the City Clerk of the City of Ontario.

The City Clerk of the City of Ontario shall certify as to the adoption of this Resolution.

PASSED, APPROVED, AND ADOPTED this 19th day of April 2022.

_____
PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO FORM:

_____
BEST, BEST & KRIEGER LLC
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. 2022- was duly passed and adopted by the City Council of the City of Ontario at their regular meeting held April 19, 2022, by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

The foregoing is the original of Resolution No. 2022- duly passed and adopted by the Ontario City Council at their regular meeting held April 19, 2022.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

ATTACHMENT A:

Addendum to the Ontario Center Specific Plan Environmental Impact Report

(Addendum to follow this page)

Addendum

to the

Ontario Center Specific Plan EIR

for the

Adept-Piemonte Overlay Project

March 2022

Addendum

to the Ontario Center Specific Plan EIR

for the Adept-Piemonte Overlay Project

(EIR No. 88-2, SCH No. 89041009)

Prepared for:

The City of Ontario
303 East "B" Street
Ontario, California 91764

Technical Assistance Provided By:

Kimley-Horn and Associates
3880 Lemon Street, Suite 420
Riverside, California 92501

March 2022

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1.0 Introduction

1.0 INTRODUCTION

This Addendum to the Certified Ontario Center Specific Plan Environmental Impact Report No. 88-2 (Certified EIR) has been prepared in response to an application for the construction and operation of approximately 71,200 square feet (SF) of retail and 694 Multi-Family Residential Dwelling Units (DU) (540,373 SF) and approximately 998 parking spaces in the City of Ontario; refer to **Figure 1**, ***Regional Vicinity Location*****.**

1.1 PROJECT BACKGROUND

The City of Ontario approved the Ontario Center Specific Plan (OCSP) in August 1981. As adopted in 1981, the OCSP provided for up to 1,530 residential units, close to seven million square feet of commercial development, and nearly two million square feet of industrial uses on approximately 600 acres. Several amendments to the 1981 OCSP, along with appropriate environmental review, have been approved by the City since its adoption. Specifically, EIR 80-3 (State Clearinghouse No. 80062538), which evaluated the original OCSP along with development proposals for adjacent areas totaling more than 1,500 acres (the "Ontario International Center" project), was certified by the City in 1980. EIR 88-2 (the Certified EIR considered by this Addendum, State Clearinghouse (No. 89041009) was certified in 1990 as a "Subsequent EIR" to EIR 80-3. The analysis presented in the Certified EIR was limited to those undeveloped portions of the OCSP remaining as of 1990, comprising approximately 495 acres located between Fourth Street and Interstate 10, and between Turner Avenue and Interstate 15.

The Project Description from the Certified EIR includes the following:

Certified Ontario Center Specific Plan Environmental Impact Report 88-2 (Certified EIR)

EIR 88-2 was prepared to review and update, where necessary, existing environmental conditions, to address the proposed redistribution of allowable building density within The Ontario Center, and to address expected impacts of a proposed regional shopping center within the Center. (EIR 88-2, page II-1).

The regional shopping center referenced above was developed in the mid-1990s as the "Ontario Mills," revising the OCSP's original concept to implement industrial uses between Milliken and the I-15. The remaining portions of the OCSP, designated for commercial and residential uses, have largely been developed. In recent years, multi-family residential development to the north of Fourth Street has occurred rapidly and has been accompanied by multiple commercial infill projects along the Milliken Avenue and Fourth Street corridors. Two multi-family residential projects totaling approximately 800 units on 32 acres, known as the Fairfield and Sares-Regis projects, are currently under construction south of Fourth Street and east of Haven Avenue. The Project described within this Addendum will account for the majority of the remaining undeveloped areas of the original OCSP; refer to **Figure 2**, ***The Ontario Center Specific Plan (OCSP)***.

As noted above, since the Certification of the Certified EIR, several addenda to the original EIR have been adopted. The following three amendments to the original Certified EIR have been certified by the City:

1) The Community Events Center Addendum (CECA), 2006, which consisted of a request for approval to construct a 9,000-seat Community Events Center, a multi-purpose stadium totaling 214,420 square feet (SF) on approximately 24.5 acres, located at the northeast corner of Concours Street and Mercedes Lane, within the Urban Commercial land use district and within the OCSP in the southernmost portion of Statistical Area "E."

2) The Piemonte at Ontario Center Addendum to the Certified EIR (POCA), 2006, was permitted to realize approximately 1,292,068 SF of mixed retail, commercial, office, and hotel uses; and up to 806 condominium/apartment units. Excluding the Project's proposed residential uses.

3) The 2017 Piemonte Overlay at Ontario Center (POOC) Mitigated Negative Declaration (MND) (PSPA 16-003) proposed approximately 1.3 million SF of retail, office, hotel, and entertainment uses; however, 791 multiple-family DU were proposed. These are summarized in Section 3.4 below and are incorporated by reference.

1.2 PROJECT SUMMARY

The proposed Project consists of a request for approval to construct 694 Multi-family DUs (540,373 SF), 71,20071,200 SF of commercial and approximately 998 parking spaces, all within Statistical Area "E"; refer to **Figure 2**. Because the proposed Project Statistical Area "E" footprint was separately amended by the previously identified CECA, POCA and the POOC MND, the proposed Project will cite to these various documents where appropriate to adequately note how the proposed Project's footprint was previously amended. The Project consists of construction and operation of a mixed-use town center development with residential and commercial/retail land use within six development areas/lots (A, B, C, D, F, and G). More specifically, the proposed Project Lots A and B will be developed in the portion of the STATISTICAL AREA "E" originally amended by the CECA. Lots C, D, F and G of the proposed Project will occur just north of Lots A and B within the portion of STATISTICAL AREA "E" previously amended by the POCA and later amended by the POOC. Refer to Section 2.0, Project Description, of this addendum. Refer to **Table 2-1**, ***Detailed Proposed Project Summary***, and **Table 2-2**, ***Land Use Comparison Summary***.

1.3 PURPOSE

The purpose of this EIR Addendum is to define, describe, compare, and contrast potential environmental impacts of the proposed Project in the context of the environmental impacts associated with the OCSP (March 1990), as assessed in the Certified EIR. In so doing, this Addendum will provide environmental documentation for the Adept-Piemonte Overlay Project at the Ontario Center consistent with the requirements of the California Environmental Quality Act (CEQA).

Section 15164 of the *CEQA* Guidelines states that an Addendum to an EIR shall be prepared "if some changes or additions [to a Certified EIR] are necessary, but none of the conditions described in [*CEQA Guidelines*] Section 15162 calling for preparation of a subsequent EIR have occurred." Section 15162 of the *CEQA Guidelines* identifies the conditions that require preparation of a subsequent EIR as follows:

No subsequent EIR shall be prepared for a project unless the lead agency determines, on the basis of substantial evidence, that one or more of the following conditions are met:

- Substantial changes are proposed in the project that require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of the previously identified significant effects;
- Substantial changes have occurred with respect to the circumstances under which the project is undertaken that will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of the previously identified significant effects; or New information of substantial importance, which was not known and could not have been known with exercise of reasonable diligence at the time the previous EIR was certified, shows any of the following:
- The project will have one or more significant effects not discussed in the previous EIR;
- Significant effects previously examined will be substantially more severe than identified in the previous EIR;
- Mitigation measures or alternatives previously found not to be feasible would, in fact, be feasible, and would substantially reduce one or more significant effects of the project, but the project proponent declines to adopt the mitigation measures or alternatives;
- Mitigation measures or alternatives that are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponent declines to adopt the mitigation measures or alternatives.

This Addendum to the Certified EIR describes the Project and substantiates how the potential environmental effects of the proposed Project are appropriately and adequately addressed in the Certified EIR and the aforementioned certified addenda and MND. The focus of the analysis is the adequacy of the previously Certified EIR, addenda and MND, relative to the Project in its current environmental context.

1.4 DOCUMENT ORGANIZATION

This Addendum is presented in four (4) sections, as follows:

- **Section 1.0**, "Introduction," provides an overview of the Project, its context, and environmental documentation applicable to the proposed development. A table summarizing impacts and mitigation from the Ontario Center Certified EIR is included in this section, and mitigation measures applicable to the Project are identified. No new or substantially modified mitigation measures are required.
- **Section 2.0**, "Project Description," presents the Project in greater detail, and describes its relationship to existing and anticipated vicinity development.
- **Section 3.0,** "Environmental Analysis," assesses potential environmental impacts of the Project. The analysis considers potential effects of the Project for all environmental topics addressed in the Certified EIR.
- **Section 4.0,** "Determination," presents the determination regarding the appropriate environmental document for the Project.

1.5 CONCLUSIONS

The analysis presented in this document substantiates that the Certified EIR for the Ontario Center is sufficient to satisfy CEQA requirements for the approval of the proposed Project at the OCSP. That is, implementation and operation of the proposed Project described herein would not result in any new or substantially more severe environmental impacts than were previously considered and addressed in the Certified EIR, or in the previously noted CECA, POCA, and POOC. Further, the Project would implement all applicable mitigation measures presented in the Certified EIR. As such, potential environmental impacts of the Project are considered to be adequately and appropriately addressed by analysis presented in the Certified EIR. The Project does not require any major revision of the Certified EIR, nor would the Project result in conditions that would require preparation of a Subsequent or Supplemental EIR as described in Sections 15162 and 15163 of the *CEQA Guidelines*.

1.6 SUMMARY OF IMPACTS AND MITIGATION MEASURES FROM THE ONTARIO CENTER CERTIFIED EIR

The following **Table 1-1**, ***The Ontario Center EIR Mitigation Measures***, is excerpted from the Certified EIR (SCH No. 89041009) and includes a summary of impacts and mitigation measures associated with *that* project. To the satisfaction of the City, the proposed Project will implement all applicable mitigation measures. As substantiated within Section 3.0 of this Addendum, no new or modified or modified mitigation measures are required.

Table 1-1: The Ontario Center EIR Mitigation Measures Monitoring and Reporting Program

Timing	Responsible Entity/Agency	Mitigation Measures	Draft EIR Page
FIRE PROTECTION			
1. Prior to issuance of a building permit	Developer	The developer will pay a fair share of "in-lieu" fees to subsidize additional facilities and equipment as mutually agreed upon by both the developer and the City of Ontario.	III-20
2. At the time of Water Master Plan Update	Developers within TOC	All new development will participate in updating the City of Ontario Water Master Plan and will contribute on a "fair share" basis toward implementation of Master Plan programs.	III-20
3. Prior to issuance of a building permit	Ontario Fire Department/Developers within TOC	Ontario Fire Department and project developer will provide, in writing, assurance of water supply adequacy from local water purveyor.	III-20
4. During site plan review	Ontario Fire Department	Design features at the site plan level will reduce risk of fire hazard. Site plan proposals will be reviewed during site plan review by Ontario Fire Department (OFD). Protection measures recommended by the OFD will be implemented by project proponent.	III-20
LAW ENFORCEMENT			
1. At the issuance of a building permit	Developer	If a proposed ordinance is adopted, the regional center builder/developer may be required to pay a one-time developer assessment fee to the Police Department at the time of issuance of a building permit. This developer fee will mitigate the fiscal impact incurred by the Police Department. Due to the projected increase in police calls for service to be generated by the development. The amount of this fee will be established by the Ontario Police Department based on land use and projected calls-for-service from that use.	III-23
2. During site plan review for individual projects	Developers within TOC	Each individual project within The Ontario Center will incorporate on-site security measures. These measures will be reviewed by the Ontario Police Department. They will include, but not be limited to, limited-height landscaping, exterior lighting, security hardware.	III-23
3. During site plan review for individual projects	Developers within TOC	In addition to these physical security and lighting requirements, the Police Department requests that the developer submit a plan delineating which functions are to be addressed by on-site private security and what functions are to be served by the Police Department. This plan may include	III-23

Timing	Responsible Entity/Agency	Mitigation Measures	Draft EIR Page
		personnel selection and training and physical security measures, i.e., video surveillance, emergency call boxes, communication and alarms. This plan shall be approved by the Police Department prior to implementation.	
SCHOOLS			
1. Prior to the issuance of a building permit	Residential Developers within TOC	Developers of residential projects within The Ontario Center will pay required school impact mitigation fees of $29,000 per gross acre to Cucamonga School District per agreement reached between the District and the developer dated December 31, 1986.	III-26
2. Prior to the issuance of a building permit	Residential Developers within TOC	Developers of projects within The Ontario Center will pay fees, as noted below, to the Chaffey Joint Unified School District: Residential $.48/square foot Commercial/Industrial/Office $.08/square foot	III-26
PARKS AND RECREATION			
1. Prior to the issuance of a building permit if a County ordinance is adopted	Developers within TOC	*Regional Parks:* The responsibility for rehabilitating existing regional parks and/or building new facilities, rests with the County of San Bernardino Parks Department. A Draft Ordinance has been prepared by the County Parks Department which will require developers to pay fees for future parks and open space. Developers within The Ontario Center shall comply with the City of Ontario's implementation of the County's fee ordinance for the collection of development fees for regional parks, trails, and open space if and when it is enacted.	III-30
2. At the time of issuance of building permit	Developers within TOC	*Local Parks:* A Park Development Fund Fee of $802/single family detached unit and $700/multiple family unit will be paid at the time of issuance of building perm its.	III-30
3. During site plan review for individual projects	Developers within TOC	Private recreational opportunities shall be encouraged for the commercial retail/industrial use areas.	III-30
WATER SUPPLY			
1. During site plan review	Developer and Ontario Municipal Utilities Company	All existing and future users will share in costs of supplemental city-wide water supply system	III-34
2. During site plan review for individual projects when water is available	Developers within TOC	Reclaimed water, as it is available from CBMWD Regional Plan No. 4, will be used for open space irrigation when economically feasible.	III-34

Timing	Responsible Entity/Agency	Mitigation Measures	Draft EIR Page
3. Ongoing	Developers within TOC	Cooperation between CBMWD, the City of Ontario, developers of The Ontario Center and other landowners will be necessary to ensure adequate capacity.	III-34
WASTEWATER			
1. During site plan review of individual project	Developer and Ontario Municipal Utilities Company	Design and construction of wastewater collection facilities within the Ontario Center will be completed under the jurisdiction of the City of Ontario.	III-38
2. Ongoing and during site plan review of individual projects	Developer and Ontario Municipal Utilities Company	Any plans for use of the non-reclaimable waste line (NRW) system will be made known to the City and CBMWD.	III-39
3. Prior to issuance of construction permits	Developer	Wastewater collection facilities will be designed so that all parcels can be served by gravity mains without pumping.	III-39
4. Ongoing	Developer and Ontario Municipal Utilities Company	The Ontario Center project development will coordinate construction activities with the City of Ontario and CBMWD to assure adequate interceptor, trunk sewer and treatment plant capacity is available as development proceeds.	III-39
5. Ongoing	Developer and Ontario Municipal Utilities Company	Continued coordination between CBMWD, the City, the developers of The Ontario Center, and other property owners/developers will occur to assure adequate capacity is available in the Cucamonga Interceptor as development occurs within the tributary area.	III-39
SOLID WASTE			
1. 2-3 Years	City of Ontario Community Facilities Department, Integrated Waste Department	Solid waste will be disposed of in Milliken Landfill. Upon closing of the Milliken Landfill, waste will be disposed of at the San Timoteo Landfill. A transfer station for the City will be constructed by the City in the next 2 to 3 years to transport waste from Ontario to the San Timoteo Landfill.	III-44, III-45
2. Ongoing	Developers within TOC/City of Ontario Community Facilities Department, Integrated Waste Department	Reusable materials will be recycled. Trash compactors will be used.	III-45

Timing	Responsible Entity/Agency	Mitigation Measures	Draft EIR Page
3. During site plan review of individual projects	Developers within TOC	Site plans shall address the use of trash bins (dumpsters) provided for office, commercial, industrial, residential other land uses.	III-45
4. Prior to ultimate build-out	City of Ontario Community Facilities Department, Integrated Waste Department	One (1) additional commercial trash vehicle will be required to serve The Ontario Center at ultimate development.	III-45
5. Ongoing	Developers within TOC	A recycling program will be undertaken within The Ontario Center to encourage the economic re-use of such items as paper, glass, metal and other salvageable material.	III-45
TELEPHONE			
1. When needed	Developer	New facilities are proposed, including a switching station and a remote switching station. Supporting Structure expenses will be shared by GTE (the telephone services provider) and the developer.	III-46
2. Ongoing	Developers within TOC	Ultimate phasing of telephone improvements shall be consistent with the development of land uses in the Center.	III-47
3. Prior to installation	City of Ontario Engineering Department	All substructure and supporting structures shall be subject to approval by the City Engineer.	III-47
4. Prior to building occupancy	GTE	GTE (telephone services provided) will place cable and wire to each unit at its own expense and there will be no charges by GTE to individual subscribers other than normal connection charges. New connections will be provided by GTE under contract to any new clients will-serve basis.	III-47
TRAFFIC			
1. As warranted by traffic volume	TOC and Developers within TOC	Buildout in the project vicinity of the proposed circulation system defined in the Specific Plan Amendment will occur.	III-60
2. When peak hour traffic reaches LOS C as determined by City Engineer	TOCOA/City of Ontario Engineering Department	Development and implementation of a Transportation Systems Management (TSM) program with a goal of a ten percent reduction in peak hour trips will occur as defined in the Specific Plan Amendment.	III-63
3. Prior to issuance of building permits	Developer(s) within and adjacent to The Ontario Center	Applicants for all future specific plans and specific plan amendments in the vicinity of The Ontario Center project will be required to complete traffic impact and mitigation studies to ensure that the forty (40) intersections studied this EIR will not exceed an intersection capacity utilization greater than Level of Service E.	III-63

Timing	Responsible Entity/Agency	Mitigation Measures	Draft EIR Page
AIR QUALITY			
1. During construction	Ontario Building Department, TOC, Developers within TOC and contractor(s)	Regular watering, paving construction roads, or other dust control measures defined in SCAQM D Rule 403 will occur during construction.	III-86
2. During construction	Developer and contractor(s)	Construction equipment will be maintained in proper tune to minimize the volume of equipment exhaust emissions.	III-86
3. When peak hour traffic reaches LOS C as determined by City Engineer	TOC, TOCOA, Developers within TOC/City of Ontario Engineering Department	Comprehensive ridesharing incentive program will be developed as part of a Transportation System Management.	III-87
4. During site review of individual projects	Developers within TOC/City of Ontario Engineering Department	Orientation of project for transit convenience and accessibility will occur in design phase; provision of easy pedestrian access will occur in design phase; provision of bus shelters, benches and bus pockets on streets.	III-87
5. During site review of individual projects	Developers within TOC/City of Ontario Engineering Department	Provision of traffic flow improvements will occur as buildout of project occurs.	III-87
6. During design phase	Developers within TOC	Inclusion of solar and other energy-saving devices in residences and businesses including: • Delamping • increased building insulation • heating/ventilation/air conditioning Improvements • solar heaters • utilization of landscape features to shade buildings	III-87
7. During construction	Developers within TOC and contractor(s)	Construction activities should avoid high ozone days and discontinue construction during second stage alerts. After grading, seed and water until vegetation cover is established.	III-87
8. During construction	TOC, Developers and contractor(s)	Wet area down, sufficient enough to form a crust on the surface with repeated soakings, as necessary, to maintain the crust and prevent dust pickup by the wind.	III-87
9. During construction	Contractor(s) within TOC	Use water trucks or sprinkler systems to keep all areas where vehicles move damp enough to prevent dust from being raised beyond site operations. W et construction areas down in the late morning and after work is completed in the day.	III-87

Timing	Responsible Entity/Agency	Mitigation Measures	Draft EIR Page
10. During construction	TOC, Developers and contractor(s)	Use low sulfur fuel for construction equipment (0.5 percent by w eight).	III-87
NOISE			
1. During construction	City of Ontario Building Department	The City of Ontario will enforce the City's noise ordinance during all phases of construction which limits the hours construction to normal weekday working hours.	III-98
2. Prior to issuance of building permit	Developers with TOC, City of Ontario Building Department	Project applicants will design private offices to 40 50 Leq (l 2), general offices and retail uses to 45 55 Leq (l 2), and industrial buildings to 55-65 Leq (l). Interior noise levels will be in accordance with the City's interior noise requirement for commercial uses.	III-98
3. Prior to issuance of building permit	Developers with TOC, City of Ontario Building Department	The project applicant will specify measures to comply with the 45 CNEL interior noise standards for residences at the time of building permit application.	III-98
4. During site plan review	Developers within TOC/City of Ontario Building Department	Locate truck access routes and loading areas away sensitive land uses such as residential areas.	III-98
5. During site plan review	Developers within TOC/City of Ontario Building Department	Locate mechanical equipment such as ventilation and air conditioning units away from sensitive receptors and install equipment with proper acoustical shielding.	III-98
6. During site plan review	Developer within TOC, City of Ontario Building Department	Minimize noise impacts through proper selection of such ventilation and air conditioning equipment.	III-98
7. Prior to issuance of building permit	Developers within TOC, City of Ontario Building Department	The project applicants will design all structures in accordance with the most recent revision of the Uniform Building Code and will implement measures to reduce noise to acceptable levels where residential buildings are proposed within the 65 CNEL contours.	III-99
8. Prior to issuance of building permit	Developers within TOC, City of Ontario Building Department	The City will review the design of proposed structures to ensure that adequate noise mitigation measures have been incorporated.	III-99
AESTHETICS			
1. During site plan review and prior to issuance of building permit	Developers within TOC/City of Ontario Planning Department	Design and construction standards as defined in the Specific Plan shall be adhered to.	III-104

Timing	Responsible Entity/Agency	Mitigation Measures	Draft EIR Page
SEISMICITY			
1. Prior to issuance of building permit	Developers within TOC/City of Ontario Building Department	The potential for groundshaking, associated with seismic activity in the region exists and is unavoidable. All requirements of the Uniform Building Code shall be met in the design and engineering of buildings on site in order to minimize the effects of seismic activity.	III-104
HYDROLOGY			
1. Prior to issuance of grading permit	Developers within TOC/City of Ontario Engineering Department	On-site drainage plans will be designed, submitted to, and approved by the City of Ontario prior to the issuance of a grading permit.	III-110
2. Prior to construction	Developers with TOC, City of Ontario Engineering Department	Proposed storm drainage facilities to be installed as The Ontario Center develops, will be placed in public streets. W here storm drains must be placed in areas other than public streets, a drainage easement will be dedicated as needed.	III-111
3. Prior to issuance of occupancy permit	Developers with TOC, City of Ontario Engineering Department	Some modification will be necessary to existing drainage facilities. No existing facility will be removed without replacement by another structure to serve the particular condition.	III-111
4. During construction	Developers within TOC/City of Ontario Engineering Department	As development proceeds, there will be a need for temporary siltation basins to reduce sedimentation from construction activities. These will be located in specific areas of construction and sized in accordance with City of Ontario criteria.	III-111
WATER QUALITY			
1. During construction	Developers within TOC and contractors, City of Ontario Engineering Department	During construction, a variety of temporary structural measures such as velocity dissipators, siltation fences or basins and. vegetative buffer zones will be used to reduce siltation and sedimentation runoff from construction sites.	III-115
2. Prior construction	Developers with TOC, contractors/City of Ontario Public Works Agency.	Periodic cleaning of storm drains and inlets, construction of pervious pavement surfaces in areas designated by the City, periodic street sweeping.	III-115
3. Ongoing	City of Ontario Public Works Agency/Developers within TOC/TOCOA	Periodic street sweeping will be conducted by the City of Ontario for streets dedicated to the City. Periodic vacuum sweeping will be conducted by the owners of individual sites.	III-115

Source: Final Mitigation Monitoring and Reporting Plan for the Ontario Center Specific Plan. SCH No. 89041009. Dated October 12, 1990.

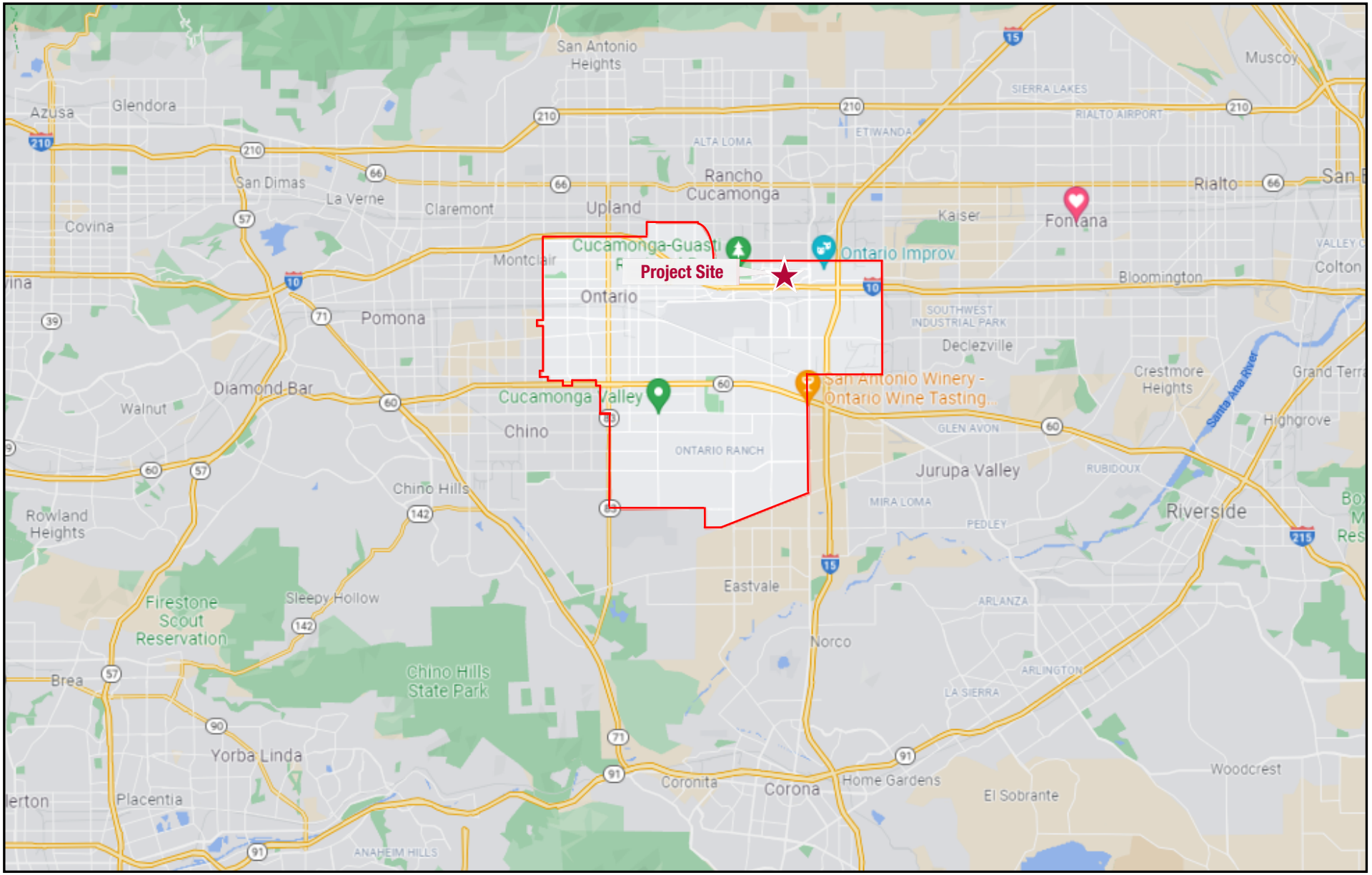

Figure 1: Regional Vicinity Map

Adept-Piemonte Overlay Project Addendum EIR

City of Ontario

Kimley»Horn

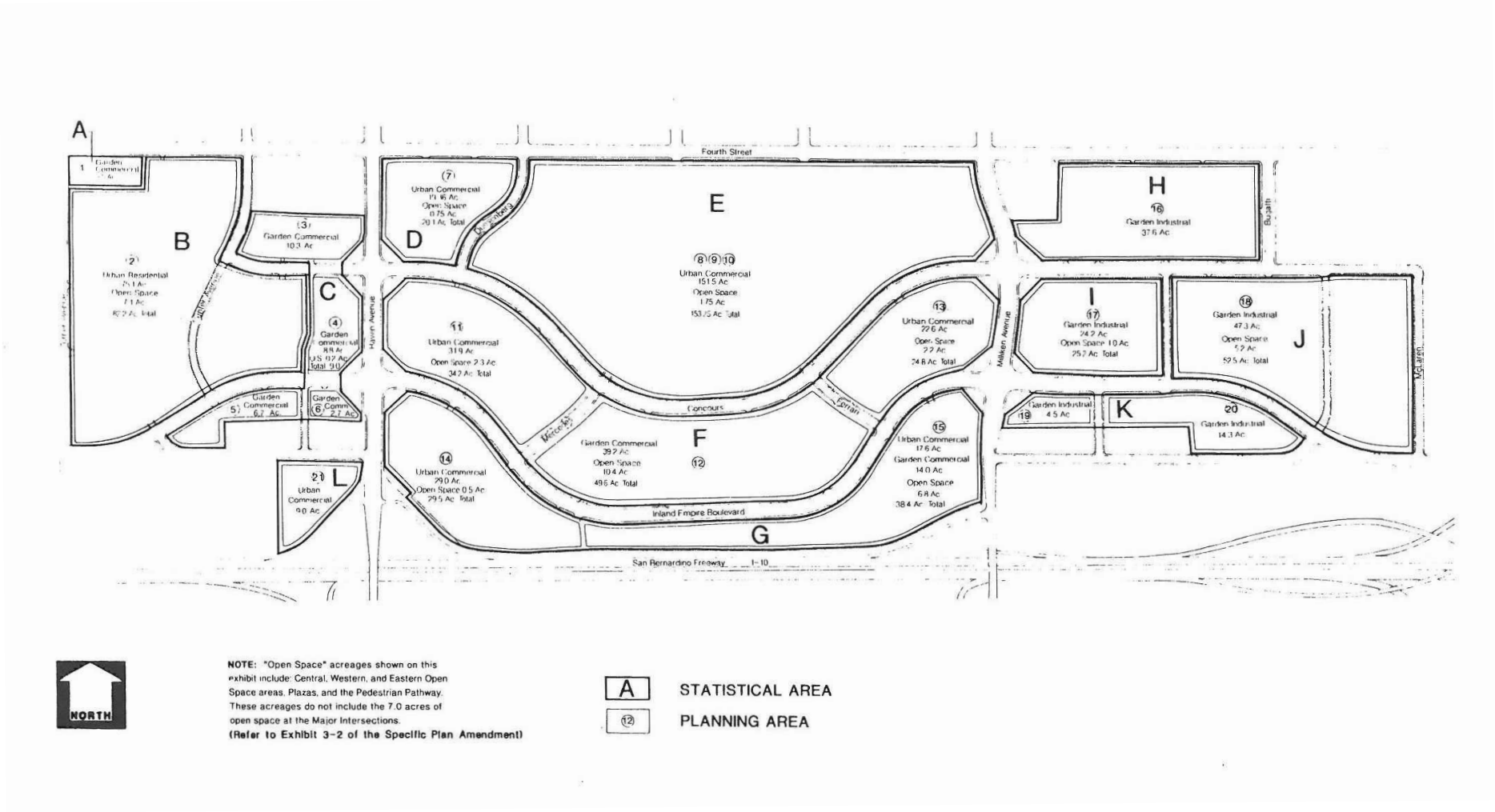

Figure 2: The Ontario Center Specific Plan (OCSP)

Adept-Piemonte Overlay Project Addendum EIR

City of Ontario

Kimley»Horn

2.0 Project Description

2.0 PROJECT DESCRIPTION

2.1 SETTING

The Project site consists of approximately 19 acres of fully developed and previously graded land located at the northerly boundary of the City of Ontario, south of Fourth Street, north of Concours Street, between Haven Avenue and Milliken Avenue, and less than one-quarter mile north of Interstate 10 (I-10); refer to **Figure 1**.

Regional access to the Project site and vicinity is provided by the I-10 and Interstate 15 (I-15) freeways, which converge approximately one mile southeasterly of the Project site. Local access to I-10 is provided at Milliken and Haven Avenues, and access to I-15 is available from Fourth Street. Supplementing freeway and surface street access, a Metrolink transit station is located approximately 1.5 miles northerly of the Project site, west of Milliken Avenue at Eighth Street.

2.1.1 Surrounding Land Uses

Figure 3, ***Local Vicinity***, provides an aerial view of the Project site and surrounding land uses. Local context of the Project is described below.

Fourth Street, which forms the site's northerly boundary, is also the corporate boundary dividing the cities of Ontario and Rancho Cucamonga. Multi-family residential uses (apartments) and a small retail/restaurant development are located northerly of the Project site across Fourth Street, in Rancho Cucamonga.

To the east, across Milliken Avenue, is the Ontario Mills Shopping Center, comprised of a central mall surrounded by free-standing commercial, entertainment, and restaurant uses. The Kohl's department store is located between the Project site and Milliken Avenue, at the southwest corner of Milliken and Fourth Street.

To the southeast, across Concours, additional existing retail uses are located adjacent to Milliken Avenue. Directly within the Project area is the existing multi-purpose Toyota Arena along with its supporting facilities. To the west, on both sides of Duesenberg Drive between Fourth Street and Concours, is the 800-unit Fairfield/Sares-Regis multi-family residential complex.

2.2 PROJECT CHARACTERISTICS

The proposed Project is the Adept-Piemonte Overlay Project, which is composed of the following six Lots: A, B, C, D, F and G, see Figure 2. Lots A and B are currently developed as vehicle parking areas serving the Toyota Arena (formerly the Citizens Business Bank Arena) and developed under the CECA. Lots C, D, F and G are vacant, but have been previously graded and are located north of Lots A and B. Lots C, D, F and G do not contain native habitat, they are fenced and are bounded by a fully developed internal roadway system. To this day, other development has occurred mostly within the western portion of Statistical Area E, see Figure 2.

The proposed Project includes a total of 694 multi-family residential DUs, 71,200 square feet of retail uses and approximately 998 parking spaces on the approximately 19-acre site. The site plan used for this analysis is provided in **Figures 9 and 10** Also refer to **Table 2-1*, Proposed Project Summary,*** and **Table 2-2, *Previous Projects vs. Proposed Project Comparison Summary***.

Table 2-1: Proposed Project Summary

Lot	Commercial (SF)	DU (SF)	Parking Area (SF)	Dwelling Units	Parking Stalls
A	25,870	268,181	153,284	384	504
B	20,802	111,021	47,526	112	194
C	11,047	75,866	37,192	94	138
D	14,095	85,305	40,966	104	162
TOTAL	71,200	540,373	278,968	694	998

Notes:
DU: Dwelling Unit(s)
SF: Square Feet

Table 2-2: Previous Projects vs. Proposed Project Comparison Summary

Land Use	Certified EIR/ OCSP (Statistical Area "E")	CECA (Statistical Area "E")	POCA (Statistical Areas "D" & "E")	POOC (Statistical Areas "D" & "E")	Proposed Project (Statistical Area "E")
Commercial/ Entertainment (SF)	-	214,420 (Arena)	447,313	562,068	-
Urban Commercial (SF)	2,200,000 (Statistical Area "E")	-	-	-	71,200
Hotel (SF)	-	-	290,400 (336 rooms)	180,000 (236 rooms)	-
Office (SF)	-	-	554,355	550,000	-
Multi-Family Residential (DU)	-	-	806	791	694
Total	**2,200,000 SF**	**214,420 SF**	**1,292,068 SF & 806 DU**	**1,292,068 SF & 791 DU**	**71,200 SF & 694 DU**

Notes:
DU: Dwelling Unit(s)
SF: Square Feet
CECA: Community Events Center Addendum
POCA: Piemonte at Ontario Center Addendum to the Certified EIR
POOC: Piemonte Overlay at Ontario center Mitigated Negative Declaration

Construction of the proposed Project is estimated to occur in one phase and is anticipated to begin in the last quarter of 2022 and last approximately 21 months. Construction activities are expected to consist of demolition, site preparation, grading, building construction, paving, and architectural coating. The proposed Project is anticipated to demolish an existing asphalt surface parking lot of approximately 7.5 acres within Lots A and B. The proposed Project is not expected to require the import or export of earthwork materials; preliminary grading estimates show a balanced site. The Project is expected to be operational in the year 2023.

2.2.1 Development Concept

The proposed Project development concept is illustrated in **Figure 4**, ***Development Concept – Lot A*** through **Figure 7**, ***Development Concept – Lot D***. The overall design concept for the proposed Project depicts a contemporary, pedestrian-oriented development, with an emphasis on wide sidewalks, outdoor seating, retail, dining areas, and landscape.

The central corridor or spine of the Project development concept is established by the north-south Via Piemonte roadway which traverses the Project site and Fourth street on the north, and terminates at Ontario Center Parkway, just north of Lots A and B. Via Piemonte is currently anchored by offices to the south and the Toyota Area and other uses further south and commercial to the east.

The proposed Project will incorporate varied landscape/hardscape features and pedestrian-oriented activity areas. Building mass and placement along Via Piemonte will be used to create interesting spaces, to include courtyards and outdoor seating areas. In so doing, the Via Piemonte development concept (Lots C and D) will provide a visually and spatially varied streetscape. Similarly, the development of Lots A and B will provide visually and spatially varied street scape visible from Concours Street and Ontario Center Parkway; refer to Figures 4 – 9.

Lots A and B are designed to emphasize dining and entertainment opportunities and will be delineated by decorative pavement and other defining landscape/hardscape treatments. This central core area is also designed to encourage visitors to move in a north/south direction, thereby fostering interaction with the hotel use and office uses located in the south and central portion of the Project site. Via Piemonte will allow for direct connectivity between all of the proposed developments. The various land use components within the Project will be connected by a series of defined pedestrian walkways. Pedestrian links have also been designed to allow workers, residents, and visitors to move through the site.

The Project will provide ample parking located in Lots E and F, abutting Fourth Street. As indicated in **Figures 4** through **9**, the proposed Project will integrate residential and commercial uses seamlessly to provide an active area that is utilized to its potential.

2.3 LAND USE AND DEVELOPMENT

2.3.1 Adept-Piemonte Land Uses and Development Components

At completion, the Project will realize more than six-hundred thousand square feet of development, as summarized in **Table 2-1**.

2.3.2 Development Intensity

The proposed Project is proposed within Statistical Area “E” of the OCSP. Statistical Area “E” is made up of Planning Areas (PAs) 8-10, totals 153.25 acres, and was originally approved for 2,200,000 square feet (SF) of urban commercial; refer to **Figure 2**.

Table 2-1 shows a breakdown of the proposed Project features. Also refer to **Table 2-2** for a comparison between the proposed Project and previous Projects approved on the site. Additionally, refer to **Table 2-3**,

Detailed Project Land Use Summary, for a specific breakdown of the proposed Project uses. As shown in **Table 2-2**, the Project is anticipated to develop the Project site with much less intensity compared than the previously analyzed and approved uses in the Certified EIR/OCSP, CECA, POCA, and POOC.

Table 2-3: Detailed Project Land Use Summary

Lot	Land Use	Units	Residential Square Feet (SF)	Commercial (SF)	Parking Spaces
A	Residential 2 Bedroom 1 Bedroom Studio	 120 180 84	268,181	-	504
	Retail	-	-	25,256	-
B	Residential 3 Bedroom 2 Bedroom 1 Bedroom	 19 63 30	111,021	-	194
	Retail	-	-	20,802	-
C	Residential 2 Bedroom 1 Bedroom Studio	 44 32 18	75,866	-	138
	Retail	-	-	11,047	-
D	Residential 2 Bedroom 1 Bedroom Studio	 58 42 4	85,305	-	162
	Retail	-	-	14,095	-
Project Total		**694**	**540,373**	**71,200**	**998**
Source: Adept-Piemonte Overlay at Ontario Center Project Site Plan Concept, March 2022.					

As noted above in **Table 2-3**, the proposed Project would realize approximately 71,200 SF of mixed retail, 694 multi-family DUs (540,373 SF) and would include approximately 998 vehicle parking spaces. The proposed commercial/retail/residential uses that would be realized under the proposed Project are consistent with uses envisioned under the Certified EIR and OCSP and would comprise 611,573 of combined SF or 1,588,427 SF less than the originally approved 2.2 million SF of allowable maximum development intensity for Statistical Area "E" which was anticipated to be a composition of urban commercial under the original OCSP and the Certified EIR, and later amended by the CECA, POCA, and POOC addendums to allow residential/ commercial/entertainment/retail, urban commercial, and office.

The subsequent addendums to the OCSP and the Certified EIR introduced a multi-family residential component which allowed up to 806 apartments within the POCA and 791 apartments within the POOC, but these amendments also included Statistical Area "D" in their analysis which is a smaller portion of the OCSP. Statistical Area "D" was also originally planned for urban commercial uses. Statistical Area "D" and

will occasionally be referenced throughout this addendum for reference purposes only in order to accurately reference the POCA and POOC projects.

Because the 694 multi-family DUs proposed by the Project would be less intense than that previously approved for the site and based on the 1,548,710 SF balance of development SF referenced above, it can be reasonably anticipated that the proposed Project in total would not exceed the remaining allowable maximum development intensity for Statistical Area E, as noted in the Certified EIR.

Additionally, an approximation of relative development intensity can be discerned by comparing defining characteristics of land uses, such as traffic generation, water demand, and wastewater generation rates. These factors are particularly appropriate when assessing the Project's relative development intensity, in that the upper limit of development intensity defined for the OCSP is founded largely on estimated roadway and water/sewer carrying capacities. In short, the forecast trip generation from the proposed Project is anticipated to be well-below the trips available for future use within Statistical Area "D and E" of the OCSP. The proposed Project is anticipated to generate approximately 94 percent less weekday trips, approximately 86 percent less weekday AM Peak Hour trips and approximately 84 percent less weekday PM Peak Hour trips than the total trips available for future uses within Statistical Areas D and E, as noted in **Table 3-3**.

As noted above, traffic generation rates would be reduced because of the Project's lower overall proposed development intensity compared to the approved development under the POOC. Similarly, water demands, and wastewater generation rates would be much lower when compared to the maximum allowable development from the OCSP on the same acreage. More specifically, it is anticipated that 694 apartment units would result in mean annual water demands of approximately 298,420 gallons per day (GPD) and 71,200 SF of commercial is anticipated to demand approximately 34,309 GPD, for a total combination of 332,729 GPD for the proposed Project. In contrast, if the same acreage was developed with commercial uses at the maximum allowable development intensity of the remaining 1,772,000 SF of urban commercial as permitted under the OCSP, water demands would be approximately 855,876 GPD[1].

Under the POCA, the site was proposed to include approximately 1.3 million square feet of mixed commercial, hotel, and office uses, as well as up to 806 condominium/apartment units would have been implemented. Total water demands of these uses were forecast at 727,888 GPD. Compared to the previously approved POCA, the proposed Project would reduce water consumption by approximately 55 percent. Total water demands of the proposed Project land uses are summarized in **Table 2-4*, Estimated Water Demand***.

Table 2-4: Estimated Water Demand

Land Use [1]	Units	Demand Factor [2]	Total Dem and
Commercial	71,200 TSF	483 GPD/TSF	34,389 GPD
Residential	694 DU	430 GPD/DU	298,420 GPD
Total Water Demand			**332,729 GPD**

[1] Ontario Center Specific Plan. Page 122

Sources:
[1]Land uses from: Piemonte at Ontario Center Development Concept, February 2006.
[2]Water demand rates from *Preliminary Sewer and Water Demand Study for Rancho Piemonte* (SB&O, Inc.) January 2006.
[3]Commercial water demand rate of 483 GPD/thousand square feet (TSF) derived from *Final Environmental Impact Report #88-2 for the Ontario Center* (P&D Technologies) October 1990, SCH #890410009, Table III-6, "Domestic Water Consumption Ultimate Development," Page III, and the POCA, Table 2-2, Estimated Water Demand Piemonte at Ontario Center Project

Additionally, maximum allowable building coverage for the Project site under the adopted OCSP is 60 percent, as averaged over the net area of each urban commercial PA. Based on the Project proposed 71,200SF of combined commercial development as shown in **Table 2-3**, and compared to the maximum allowable commercial development intensity of the remaining 1,772,000 SF of urban commercial as permitted under the OCSP, the Project proposed a building coverage for the Project site of 4.0 percent, or 56 percent less commercial building coverage than permitted under the OCSP.

Based on the preceding discussions, development intensities realized under the proposed Project would be no greater than those anticipated under the adopted OCSP. Further, related environmental effects of the proposed Project would be no greater than, and would be reduced, when compared to anticipated environmental effects that would result under commercial development of the site envisioned under the adopted OCSP, and also the POCA and POOC as these last two originally proposed greater development intensity of the site than the proposed Project.

2.3.3 Circulation Plan Concept

The Project would utilize the existing private and public circulation system (namely Ontario Center Parkway, Via Piemonte, Via Asti, Concours Street, and Fourth Street) and would follow the established design standards for vehicular and pedestrian movement. Following are summary descriptions of both the vehicular and pedestrian circulation systems.

2.3.4 Vehicular Circulation

Primary access to the Project would be provided via public roadways that border the Project site, including Haven Avenue to the west, Concours Street to the south, and Fourth Street to the north. Within the Project site, access to individual uses would be provided by privately owned and maintained streets, as well as the public Ontario Center Parkway. Private streets within the Project site would provide for and incorporate necessary access/public utilities easements.

Pedestrian Circulation

The proposed Project will make use of the existing pedestrian network which provides connections, to and supports interaction, between the various Project land uses. The Project pedestrian network largely parallels the serving roadway network, with additional internal pedestrian linkages providing connections between the Project land uses. Defined connections are also provided where the Project pedestrian network connects to other existing pedestrian paths.

The pedestrian network will be enhanced with landscaping and would typically include ornamental grasses, groundcover, and shrubs, all of which are thematically employed throughout the Project site.

2.4 LANDSCAPE CONCEPT

Figures 9 and 10 provide a sense of landscaping features and their locations within the proposed Project. The proposed landscape would be consistent with the design guidelines of the Specific Plan, specifically as noted as Operational Design Features E-DF-4, and those design elements as noted in **Table 1-1**.

2.5 PROJECT PHASING AND CONSTRUCTION SEQUENCE

2.5.1 Buildings and Facilities

Construction of the proposed Project may occur in more than one phase. Construction is anticipated to begin during year 2022.

2.5.2 Utilities and Infrastructure

The Project site and its vicinity is fully developed, and utilities infrastructure have been previously installed and fitted to accommodate the maximum planned development under the CECA, POCA, and POOC. According to the OCSP and the Certified EIR, maximum allowed development intensity within Statistical Area "E" was 2,200,000 SF, while Statistical Area "D" maximum allowed intensity was 640,000 SF. As previously noted, the proposed Project would introduce a mixed-use development with a lower development intensity of 71,200 SF of commercial and 694 multi-family apartment units. All roadway improvements (public and private) have been previously developed with the implementation of the existing uses.

2.5.3 Parks and Open Space

Public and private urban open/common space areas within the Project would be completed concurrent with, and largely as a consequence of, completion of adjacent building and facilities within the Project area. In this sense, open/common space areas would support and complement other aspects of the Project in a manner and fashion consistent with likely demands for, and use of, these facilities. In addition, the Project would comply with applicable City/OCSP park dedication/in-lieu fee payment requirements.

2.6 INTENDED USE OF THIS ADDENDUM, PROJECT DISCRETIONARY ACTIONS

2.6.1 Use of this Addendum

This EIR Addendum will serve as the City of Ontario's environmental review of the Project as required under CEQA. The City may also employ this Addendum EIR in any subsequent review or consideration of the individual development proposals within the Project area.

2.6.2 Project Discretionary Actions, Permits, Consultation

Discretionary actions, permit and related consultation(s) necessary to approve and implement the Project include, but are not limited to, the following.

2.6.2.1 Discretionary Actions

CEQA Section 15124 states in pertinent part that if "a public agency must make more than one decision on a project, all its decisions subject to CEQA should be listed." Requested decisions, or discretionary actions, necessary to realize the Adept-Piemonte Overlay Project at The Ontario Center include the following:

- Certification of this Addendum to the Ontario Center EIR;
- Adoption of the -Piemonte Overlay at Ontario Center Specific Plan Amendment (File no. PSPA21-001);
- Approval of Parcel Maps;
- Approval of Tract Map(s) for condominium purposes;
- Development Plan Approvals for various development parcels;
- Approval of the Project Development Agreement;
- Approval of Infrastructure Improvement Plan, including but not limited to: roads, sewer, water, and stormwater management systems;
- Approval of Conditional Use Permit(s).

2.6.2.2 Consultation and Permits

CEQA Section 15124 also states that environmental documentation should, to the extent known, list other permits or approvals required to implement the Project. Based on the current Project design concept, in addition to City permits and approvals, anticipated permits necessary to realize the proposal will likely include, but are not limited to the following:

- Permitting may be required by/through the Regional Water Quality Control Board (RWQCB) pursuant to requirements of the City's National Pollutant Discharge Elimination System (NPDES) Permit;
- Permitting may be required by/through the South Coast Air Quality Management District (SCAQMD) for certain equipment or land uses that may be implemented within the Project area.
- Various construction, grading, and encroachment permits allowing implementation of the Project facilities.

Figure 3: Local Vicinity Map

Adept-Piemonte Overlay Project Addendum EIR

City of Ontario

Not to Scale

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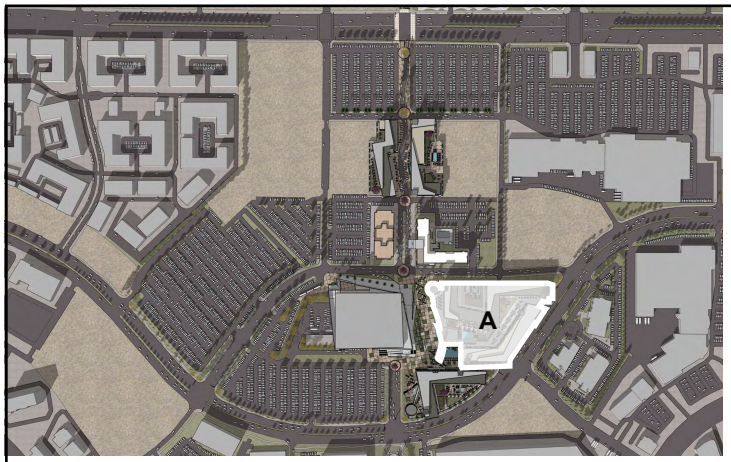

Unit Count - Total 384
120 - 2 Bedroom
180 - 1 Bedroom
84 - Studio

Parking Count - Total: 504

Retail Area: 25,870 ft²
Net Residential Area: 268,181 ft²

Figure 4: Development Concept - Lot A
Adept-Piemonte Overlay Project Addendum EIR
City of Ontario

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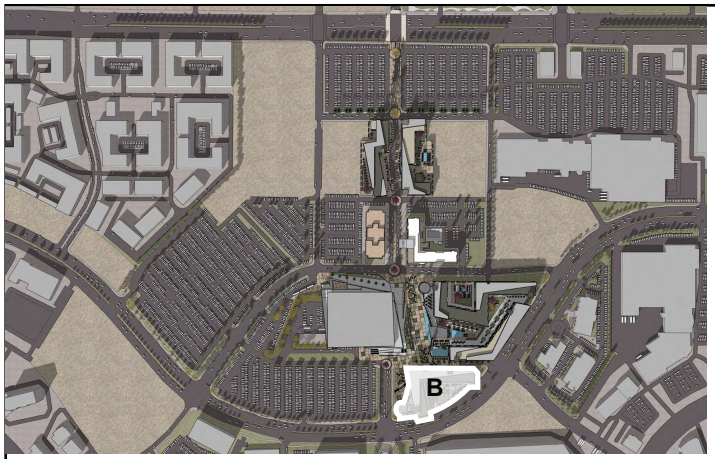

Unit Count - Total 112
19 - 3 Bedroom
63 - 2 Bedroom
30 - 1 Bedroom

Parking Count - Total: 194

Retail Area: 20,802 ft²
Net Residential Area: 111,021 ft²

Figure 5: Development Concept - Lot B
Adept-Piemonte Overlay Project Addendum EIR
City of Ontario

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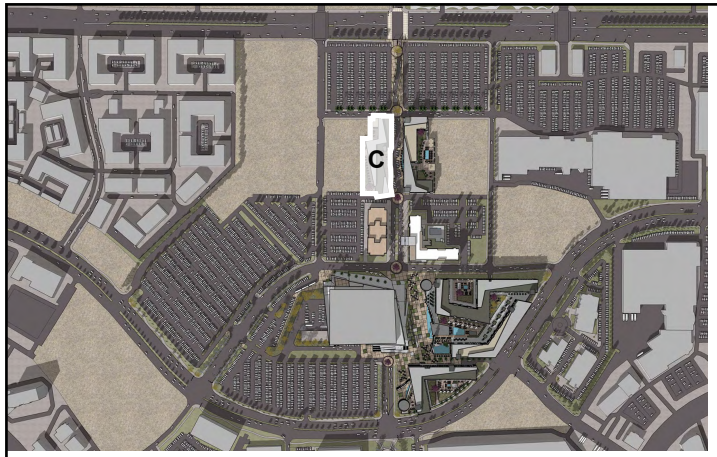

Unit Count - Total 94
44 - 2 Bedroom
32 - 1 Bedroom
18 - Studios

Parking Count - Total: 138

Retail Area: 11,047 ft²
Net Residential Area: 75,866 ft²

Figure 6: Development Concept - Lot C
Adept-Piemonte Overlay Project Addendum EIR
City of Ontario

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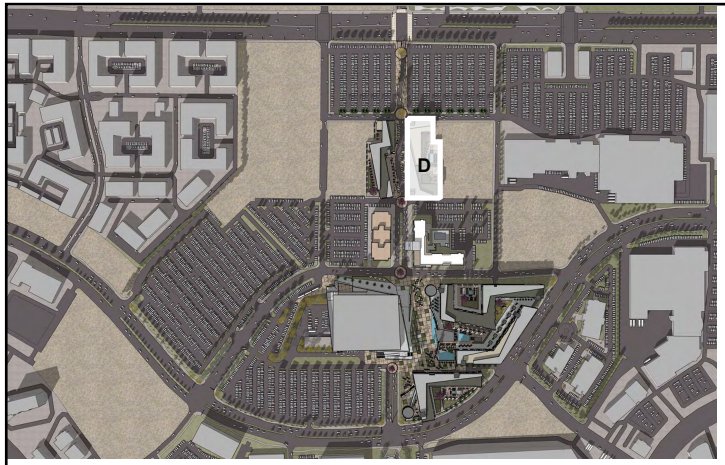

Unit Count - Total 104
58 - 2 Bedroom
42 - 1 Bedroom
4 - Studios

Parking Count - Total: 162

Retail Area: 14,095 ft²
Net Residential Area: 85,305 ft²

Figure 7: Development Concept - Lot D
Adept-Piemonte Overlay Project Addendum EIR
City of Ontario

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3.0 Environmental Analysis

3.0 ENVIRONMENTAL ANALYSIS

3.1 INTRODUCTION

Land uses and development characteristics of the proposed Project are similar in scope but lower in intensity to development of the subject site anticipated under the OCSP, the CECA, POCA, and POOC. Potential environmental impacts of the OCSP were comprehensively assessed in the Certified EIR for the Ontario Center, State Clearinghouse No. 89041009 (Certified EIR). The following discussions summarize potential environmental impacts of the proposed Project within the context of the environmental analysis presented in the Certified EIR. As demonstrated by the subsequent environmental analysis, the Project would not result in any new, different, or substantially increased impacts than those that were considered and addressed in the Certified EIR, CECA, POCA, or the POOC.

3.2 ALLOWED AND PROPOSED MAXIMUM DEVELOPMENT INTENSITY

The proposed Project will occupy a portion of Statistical Area "E" of the OCSP. The Certified EIR addressed potential impacts that would result from implementation of a calculated maximum allowable development intensity of the Statistical Area "E," as provided for under the OCSP. The referenced maximum allowable development intensity considered in the Certified EIR included up to 2,200,000 SF of regional retail center.

The proposed Project would realize a different mix of urban commercial uses than those originally envisioned under the OCSP as well as the proposed Project would incorporate multi-family residential units which is a consistent use for the site based on the previously approved CECA, POCA, and POOC. However, as demonstrated within this Addendum, development intensity of the proposed Project will not exceed the maximum allowable development intensity considered under the Certified EIR, the CECA, POCA, and POOC for both the multi-family and commercial components.

3.3 ALLOWED AND PROPOSED LAND USES

The Project site was originally designated as "Urban Commercial" by the OCSP. Permitted uses within the Urban Commercial land use designation include retail and service-oriented businesses; administrative, professional and medical offices; institutional, financial and governmental facilities; indoor and outdoor restaurants and cocktail lounges; theaters and entertainment complexes; parking lots and parking facilities; outdoor vendors; automobile services and service stations; hotels, motels and motor inns; conference and convention facilities; medical and hospital facilities; residential dwellings (above the ground floor); trade schools; and community facilities, such as libraries, police or fire stations.

As presented in Addendum Section 2.0, Project Description, the CECA, POCA, and later the POOC amended the original OCSP which proposed uses that were consistent with the Urban Commercial land use designation and intent of the OCSP to provide for an integrated mixed-use urban commercial center within the City while also adding multi-family residential uses. As such, in order to realize the Project as proposed in the POCA, certain development standards of the OCSP were amended to allow for specific facilities configurations and design elements proposed by the POCA. As discussed subsequently in this Addendum, land uses realized under the proposed Project would not generate any new or additional

environmental impacts that were not previously considered and addressed in the Certified EIR, the CECA, POCA, or the POOC.

3.4 PREVIOUS ENVIRONMENTAL DOCUMENTATION, DOCUMENTS INCORPORATED BY REFERENCE

Section 15150 of the State CEQA Guidelines permits and encourages that an environmental document incorporate by reference other documents that provide relevant data. The documents outlined in this section are hereby incorporated by reference, and the pertinent material from each is summarized throughout this Addendum. All documents incorporated by reference are available from the Planning Department at the City of Ontario, located at 303 East "B" Street, Ontario, CA 91764.

- **Ontario General Plan Final EIR/Master Environmental Assessment.** The Ontario General Plan Final EIR/Master Environmental Assessment provides an overall description of City's environmental setting; addresses potential environmental impacts associated with implementation of the City General Plan under buildout conditions; and identifies applicable policies and implementation programs which act to reduce potentially significant environmental effects resulting from General Plan implementation/buildout. Background information and areawide analyses presented in the Ontario General Plan Final EIR/Master Environmental Assessment provide context for the Piemonte at Ontario Center Project and its potential environmental effects.

- **Final Environmental Impact Report (FEIR) No. 88-2 (Certified EIR) for The Ontario Center Specific Plan (OCSP), 1990.** The Final Environmental Impact Report for the OCSP identifies anticipated environmental impacts resulting from the Specific Plan and presents a responsive Mitigation Monitoring Plan (MMP) or Mitigation Monitoring and Reporting Program (MMRP). The MMP/MMRP was developed to avoid or minimize the extent and severity of anticipated impacts of the Specific Plan.

  Information and analysis presented in the Final EIR including the MMP provide the basis and context for evaluation of the Adept-Piemonte at Ontario Center Project's (proposed Project) potential environmental impacts. As discussed in this Addendum, the proposed Project will not result in any new or substantially different environmental impacts than were previously considered and addressed in the Final EIR for the OCSP. As also presented in this Addendum, the proposed Project would comply with, and implement all applicable mitigation measures presented in the OCSP Final EIR MMP/MMRP.

- **Community Event Center Addendum to the Certified EIR.** The Community Events Center Addendum (CECA) to the Certified EIR was certified February 1, 2006, and is relevant to the proposed Project in that it was prepared in response to an application for the development of the City of Ontario Community Events Center. This project proposed the development of a 214,420 square foot multi-purpose indoor stadium and events center, with fixed seating for approximately 9,000 persons, associated pedestrian plazas, landscaping, off-street parking facilities for approximately 2,100 automobiles and a truck loading/unloading area, with related truck parking and outdoor storage areas and provides an updated description of the encompassing OCSP and establishes a general framework for comparative analysis resulting from recent and previous

amendment(s) to the Specific Plan; refer to **Figure 8, *Community Events Center Specific Plan (CECA)***. The CECA area is currently developed with the Toyota Arena and vehicle parking areas. The CECA eastern vehicle parking areas are anticipated to host the proposed Project portions identified as Lots "A and B"; refer to **Figure 9, *Project Site Plan (Lots A and B)*** and **Figure 10, *Project Site Plan (Lots C and D)***.

- **Piemonte at Ontario Center Addendum to the Certified EIR.** The Piemonte at Ontario Center Addendum (POCA) to the Certified EIR project was certified in February 2006 and is relevant to the proposed Project in that it amended Statistical Areas "D and E." In 2004, an application was made by Panattoni Development to the City of Ontario for an urban character mixed-use project, to be constructed on an approximately 88-acre site located between Fourth Street and I-10, exclusive of the then approved Fairfield/Sares-Regis residential project, and west of the existing Kohl's retail center. The POCA provides an updated description of the encompassing OCSP and establishes a general framework for comparative analysis resulting from recent and previous amendment(s) to the Specific Plan; refer to **Figure 11**, ***Piemonte at Ontario Center Addendum Specific Plan (POCA)***. The POCA encompassed a large northeast portion of the OCSP Statistical Area "E." This area is anticipated to host Lots C, D, F, and G of the proposed Project; refer to Figure 5.
- **Piemonte Overlay at OCSP (PSPA 16-003).** More recently, the Piemonte Overlay at Ontario Center (POOC) Mitigated Negative Declaration (MND) (PSPA 16-003) was certified on May 16, 2017, and is relevant to the proposed Project in that it also amended Statistical Areas "D and E." The project proponent submitted a request for approval of an amendment to the OCSP, which revised the land use map and development concept of the POCA area to facilitate the development of the balance of the 84-acre site. Like the POCA, this amendment proposed approximately 1.3 million square feet of retail, office, hotel, and entertainment uses and 791 multi-family DUs. The 791 multi-family DUs were slightly fewer DU than the quantity allowed by the POCA. The POOC amended the land use configuration of the same footprint considered in the POCA. The POCA provides an updated description of the encompassing OCSP and establishes a general framework for comparative analysis resulting from recent and previous amendment(s) to the OCSP; refer to **Figure 12, *Piemonte Overlay at Ontario Center Specific Plan (POOC)***. Identical to the POCA project area, the POOC MND encompassed the same large portion of the OCSP Statistical Areas "D and E." The portion of the OCSP that is within Statistical Area "E" is anticipated to host Lots C, D, F, and G of the proposed Project, as shown in Figure 2.

3.5 ENVIRONMENTAL TOPICS

The Certified EIR addressed the following major environmental topics: land use and planning, socioeconomics, public services, public utilities, traffic and circulation, biology, air quality, noise, aesthetics, seismicity, hydrology, and water quality. As presented in **Table 1-1** of this Addendum, the Certified EIR proposed mitigation measures for all potentially significant impacts. All applicable mitigation measures identified in **Table 1-1** will be implemented by the Adept-Piemonte at Ontario Center Project. For each environmental topic presented in the Certified EIR, the following analyses substantiate the proposed Project's consistency with development envisioned under the OCSP Project and analyzed in the Certified EIR.

3.5.1 Land Use and Planning

The Certified EIR considered potential land use/planning impacts of the OCSP. The current General Plan Land Use designation is "Mixed Use Ontario Center" and the subject site has a specific plan land use of "OCSP, Urban Commercial Land Use – Piemonte Overlay." As previously noted, under this General Plan Land Use designation, a maximum of 2,840,000 square-feet (SF) of Urban Commercial uses are permitted within Statistical Areas D and E combined or 2,200,000 SF of Urban Commercial within Statistical Area E only, of the encompassing OCSP. As discussed in the Certified EIR for the OCSP, this upper limit of development intensity is based primarily on the carrying capacities of the Specific Plan roadways and utilities systems.

The OCSP Urban Commercial land use designation provides for development of tourist-related commercial uses, high and medium-rise office buildings, entertainment/recreation clusters, and high-density residential uses integrated with adjacent uses. The Project proposes land uses and development concepts that are consistent with development envisioned under and encouraged by the Urban Commercial land use designation but would amend the OCSP to establish the definitive mix of uses in the proposed Adept-Piemonte at Ontario Center Addendum EIR Project.

3.5.1.1 Development Intensity

According to the POCA, under the adopted OCSP, the Statistical Areas D and E could accommodate up to 2,840,000 SF of development intensity.[2] Of the maximum 2,840,000 SF of development intensity allowed within Statistical Areas "D and E," an estimated 1,068,000 SF existed at the time the POCA was certified, or was anticipated under other development proposals.[3] The remaining approximately 1,772,000 SF of allowable development intensity provides a baseline for comparison of development intensities that could be realized under the current OCSP, vis-a-vis development that is proposed under the Project.

As currently envisioned, the proposed Project would realize approximately 71,200 SF of commercial and 540,373 SF of multi-family residential (694 units). Excluding the Project's proposed residential uses, the approximately 71,200 SF of commercial uses that would be realized under the Project are consistent with uses envisioned under the OCSP, and would comprise 1,700,800 SF less than the calculated 1,772,000 SF of remaining allowable maximum development intensity for Statistical Areas D and E. Therefore, because of the 694 multi-family DUs proposed, the Project is determined to be no more intense than the 1,700,800 SF balance referenced above, it can be reasonably inferred that the Project in total would not exceed the remaining allowable maximum development intensity for Statistical Areas D and E, refer to **Table 2-3**.

An approximation of relative development intensity was typically discerned by comparing defining characteristics of land uses, such as traffic generation, water demand, and wastewater generation rates. These factors were particularly appropriate when assessing the Project's relative development intensity, in that the upper limit of development intensity defined for the OCSP is founded largely on estimated

[2] Ontario Center Specific Plan, Page 15, Table 3-A "Development Intensity."

[3] Approximately 108,000 s.f. is developed as "Khol's"; an estimated 530,000 s.f. in development intensity is allocated for the 32-acre Fairfield/Sares-Regis residential project; and an estimated 430,000 s.f. is allocated for the 28.85-acre future OCEC project. Assumes an average 0.38 FAR over aggregated Statistical Areas D and E, based on maximum allowable development intensity of 2.86 million square feet on approximately 153.25 acres.

roadway and water/sewer carrying capacities. Water/sewer demands of the Project, as compared to water/sewer demands resulting from correlating maximum buildout of urban commercial uses per the adopted OCSP are summarized below.

Regarding traffic/trip generation, in response to Senate Bill (SB) 743, the California Natural Resource Agency (CNRA) certified and adopted new CEQA Guidelines in December 2018 which now identify Vehicle Miles Traveled (VMT) as the most appropriate metric to evaluate any give project's transportation impact under CEQA (Section 15064.3). Effective July 1, 2020, the previous CEQA metric of Level of Service (LOS), typically measured in terms of automobile delay, roadway capacity and congestion, generally will no longer constitute a significant environmental impact. The City of Ontario has adopted guidelines to provide recommendations in the form of and methodology and thresholds of significance for identifying VMT related impacts. The proposed Project is subject to a VMT analysis and will adhere to the recommendations and practices described in the *City of Ontario Planning Commission Resolution No. PC20-021 (May 26, 2020).*

As discussed in greater detail at Section 3.5.5, *Traffic and Circulation*, total average daily traffic that would be generated by the Project is approximately 95 percent less than would otherwise result under buildout of the subject site per the maximum development intensities allowed under the OCSP. Development intensity of the Project, as characterized by traffic generation, is therefore substantially reduced when compared to maximum allowable development intensities identified under the OCSP. This reduction in traffic generation rates is due largely to the fact that the Project will implement an integrated residential component, which would result in substantially reduced daily trips, and p.m. peak-hour trip generation rates compared to trip generation rates that would result from maximum allowable commercial intensities on the same acreage. Relative traffic generation rates would be substantially reduced because of the Project's residential component.

Similarly, because of the large difference in development intensities between the maximum allowed under the OCSP and the Certified EIR and the proposed Project, it is anticipated that water demands and wastewater generation rates when compared to maximum allowable commercial intensities on the same acreage would also be reduced. More specifically, it is anticipated that 694 multi-family units and 71,200 SF of commercial uses would result in mean annual water demands of approximately 332,729 GPD; refer to Table 2-4. In contrast, if the same acreage was developed with Urban Commercial uses at the maximum allowable development intensity of 1,772,000 SF (2,200,000 SF – 428,000 SF of existing development = 1,772,000 SF of remaining buildable SF), water demands would be approximately 855,876 GPD.

As wastewater generation is a direct function of water consumption, it can be anticipated that the Project's residential component would also result in lower wastewater generation than would result under maximum development of the same acreage with commercial uses, or under the previously approved CECA, POCA, or POOC which all assumed a higher development intensity than the proposed Project, as shown in **Table 2-2**.

If considered independently then, the Project's residential uses would result in decreased water/sewer demands compared to maximum development of the same acreage with commercial uses. When

considered in the context of the total Project, the calculated water and sewer demands resulting from the Project residential land uses are minimal relatively to the permitted development under the approved OCSP. Total water demands of the Project land uses are summarized in **Table 2-4**.

Based on the preceding discussions, development intensities realized under the proposed Project would be no greater than those anticipated under the adopted OCSP. Further, related environmental effects of the proposed Project would be no greater than, and would likely be reduced, when compared to anticipated environmental effects that would result under commercial development of the site envisioned under the adopted OCSP.

3.5.1.2 Development Standards and Land Use Compatibility

The Project proposes commercial and residential uses similar to those allowed for and envisioned under the OCSP Urban Commercial land use designation and under the POCA and POOC. Further, development concepts and plans articulated for the proposed Project are considered to be substantially consistent with the themes and standards of the approved OCSP, the General Plan, and the Zoning Ordinance. The Project does, however, propose to amend the OCSP to allow for facilities, configurations and design elements specific to the proposed Project.

As discussed previously in this Section, Statistical Areas "D and E" of the OCSP are designated as Urban Commercial land uses. Within the Urban Commercial land use designation, permitted uses include "high density residential uses integrated with adjacent uses." [*Ontario Center Specific Plan*, Page 10] The Urban Commercial land use designation does not specify an upper limit to residential development densities, other than such development may not exceed the maximum allowable development intensity for the encompassing Statistical Area.

Further, all proposed residential units will be designed and constructed to achieve noise standards contained in the Ontario Municipal Code, as required under 4.2.1.13 (B). As presented above in Addendum Section 3.5.1.1, "Development Intensity," the Project in total will not exceed the maximum allowable development intensity for Statistical Areas D and E, including water and sewer demands. Design and construction of water and sewer services available to the Project land uses will be reviewed and approved by the City Engineer prior to issuance of development permits, consistent with the requirements of 4.2.1.13 (C).

Multi-story, high-density residential development as proposed by the Project supports the intent of the OCSP to provide:

- A balance of employment, shopping, and housing opportunities, reducing the need for long commutes.

  and

- A higher density housing orientation, recognizing trends toward smaller household size.

  [*Ontario Center Specific Plan*, Page 8]

More specifically, the considered residential units will be located immediately adjacent to the commercial/retail types of uses, and in this sense, the Project provides for an integrated balance of

employment, shopping, and housing opportunities, and establishes a sense of community through collocation of residential uses and supporting retail/commercial/entertainment uses.

Association of the Project's urban residential densities with commercial uses also promotes, and makes feasible pedestrian access throughout the Project area, acting to reduce reliance on private automobiles. This is consistent with the intent of the OCSP to reduce dependence on private automobiles, with correlating reductions in VMT.

Residential development will reflect architectural themes and hardscape/landscape elements evidenced throughout the Project area, acting to visually tie these residential uses to other Project land uses. A direct visual/architectural tie is made between abutting residential areas. Multi-story residential uses will also reflect urban themes, building heights, and building masses evidenced elsewhere within the Project; refer to **Figure 13, *Elevations (Lots A and B)*** and **Figure 14**, ***Elevation (Lots C and D)***.

Lastly, it is noted that residential densities proposed by the Project (at least 40 units per acre) provide for efficient use of available land and recognize local and regional demographic trends towards smaller household sizes. As noted previously in this Section, proposed residential densities as described are achieved within the maximum allowable development intensities for Statistical Areas "D and E."

Summary

Development intensities proposed by the proposed Project are less than the maximum allowable development intensities considered in the Certified EIR. It will not be necessary for the proposed Project to modify the OCSP as the POCA was previously amended it in February 2006 and the POOC further amended it in May 2017 to allow for specific Project facilities configurations and design elements, to include certain allowances for construction of multi-story residential DUs, with ground floor units at a greater intensity than the currently proposed Project.

Land uses proposed by the proposed Project are considered to be consistent with the mix of land uses and development intent of the OCSP, POCA, and POOC, and would not result in land use impacts not already considered and addressed in the Certified EIR. On the basis of the preceding discussions, the Project will not create new, additional, or substantially different land use impacts than those identified within the Certified EIR. Therefore, no changes or additions to the Certified EIR analysis are necessary.

3.5.2 Socioeconomics

The Certified EIR considered potential socioeconomics impacts of the OCSP. As a general note, it is recognized that the *2004 CEQA Guidelines* no longer reflect "socioeconomics" as an environmental topic. The relevant areas of discussion addressed previously under the heading of socioeconomics are now reflected in consideration of potential population, housing, and jobs/housing balance impacts, and related transportation and air quality impacts. Economic effects of the proposed Project would be considered only to the extent that they may result in adverse physical impacts.

Of the above considerations, localized effects of the Project will include increased housing availability, combined with supporting commercial, office, recreation, and entertainment uses. Localized effects will

also include new employment potentials accruing from the Project's non-residential land uses. Increased employment and housing availability resulting from the Project reflect areawide projections for continuing population and jobs growth within the City and region.

By integrating residential and business/commercial land uses, the Project supports City and areawide goals and policies providing for a balance of jobs and housing. One of the primary benefits of a balanced jobs/housing ratio within the region is a potential reduction in commute distances, as places of employment will be located closer to residential areas.

As the Project proposes land uses consistent with those allowed by the OCSP and would not result in development intensities greater than those considered in the Certified EIR, the Project will not result in any new or substantially different socioeconomic considerations than were addressed in the Certified EIR. No changes or additions to the Certified EIR analysis are necessary, nor is there a need for any additional mitigation measures. Please also refer to Section 3.5.1, "Land Use."

3.5.3 Public Services

The Certified EIR considered potential public services impacts of the OCSP. As discussed under Addendum Section 3.5.1, "Land Use," the Project proposes land use categories and development intensities contemplated under the adopted OCSP and Certified EIR. As land use categories and development intensities largely define demands for public services, it is anticipated that public services demand from the proposed Project would not exceed, nor be substantially different than, those considered and addressed in the Certified EIR. On this basis, the Project will not result in any new or substantially different public services impacts than were addressed in the Certified EIR. No changes or additions to the Certified EIR analysis are necessary, nor is there a need for any additional mitigation measures. Please refer also to Addendum Section 3.5.1, "Land Use and Planning."

3.5.4 Utilities

The Certified EIR considered potential utilities impacts of the OCSP. Defining examples of utilities demands of the Project, as compared to demands anticipated under the Certified EIR are presented in Addendum Section 3.5.1, "Land Use and Planning." Under the cited topical areas of traffic generation, water demand, and wastewater generation, it is anticipated that impacts of the proposed Project would be less than those addressed under the maximum development intensities considered in the Certified EIR. It is anticipated that impacts to all other utilities would be similarly reduced under the proposed Project when compared to utilities demands resulting from maximum allowable development intensities for the subject site.

3.5.4.1 Infrastructure

Extensive utility infrastructure surrounds, and is available to, the Project site. In general, the existing infrastructure serving the Project site and vicinity has been sized to accommodate anticipated future development of the area and is adequately sized to serve the Project. Because the Project site has been previously developed with various uses, infrastructure is already in place. This section describes the existing backbone infrastructure system available to the Project site. Infrastructure systems described

within this section include wastewater collection/ treatment, potable water distribution, recycled water distribution, and stormwater management/treatment.

3.5.4.2 Wastewater

Wastewater treatment services for the City of Ontario and other nearby communities are provided by Inland Empire Utilities Agency (IEUA). This Agency is responsible for treatment of wastewater generated by the Project. Wastewater will be transported to IEUA Regional Plant No. 1 (RP-1) via the City of Ontario wastewater collection and conveyance system. IEUA Regional Plant No. 1 is located south of the Pomona Freeway (SR-60) and west of Archibald Avenue. The backbone sanitary sewer system for the Project site and vicinity is made up of private and public sewer system components. Along the Project perimeter, public streets would accommodate sewer system improvements to be implemented by the Project.

A 24-inch IEUA sewer interceptor exists in Fourth Street along the northerly boundary of the Project site. This interceptor captures all wastewater from north of Fourth Street within Rancho Cucamonga and transfers it west along Fourth Street. Therefore, the Project area does not accept any off-site wastewater from the north. All wastewater flows generated by the Project would be transported via 8-to-10- inch sewer lines to Concours Street. At Concours Street, these lines would connect to the existing 8-to-12- inch sewer mains. These mains currently connect to an 18-inch main, that in turn connects to the Inland Empire Boulevard sewer main to the south.[4]

The collection sewer main to the south of the Project site, originally called the Ontario Motor Speedway Outfall, was sized to handle flows from the site. This outfall line ultimately flows west along Inland Empire Boulevard then proceeds south beneath I-10. Sanitary sewer facilities constructed south of I-10 have previously been upgraded and sized to adequately handle development of the Project site and surrounding area.

With regard to Project-related wastewater system requirements, based on information presented in the POCA, the existing receiving wastewater transmission facilities within Concours Street have enough overall capacity to adequately convey wastewater generated by the POCA project as proposed. More specifically, as concluded in the POCA, the depth to diameter (d/D) design standard of 0.50 for these transmission facilities was maintained even with the addition of wastewater generated by the POCA project. The POCA further noted that it conservatively assumed 2.7 persons per dwelling unit, with a calculated wastewater generation rate of 100 gpd/person, or 270 gpd/DU which would have resulted in approximately 217,620 GPD of wastewater. However, approximately one-half of the Project dwelling units where originally anticipated to be of single bedroom configuration(s), and as such would have likely resulted in reduced overall resident populations with correlating reductions in wastewater generation. The Project proposes to construct 694 multi-family DU (111 DU less than the previously approved by the POCA) and at the 270 gpd/DU would equate to approximately 186,570 GPD of wastewater. Based on the previous data, the proposed Project is anticipated to generate approximately nine percent less GPD of wastewater compared to the POCA. As wastewater generation is a direct function of water consumption, it can be anticipated that the Project would similarly result in less wastewater generation than would the

[4] Final Environmental Impact Report (FEIR) No. 88-2 (Certified EIR) for The Ontario Center Specific, 1990.

maximum development of the same acreage with commercial-office uses or compared to the OCSP, POCA, and POOC since these all proposed a greater development intensity than the Project site.

3.5.4.3 Water Service

Water service to the Project site is provided by the City of Ontario. Existing water facilities include mains located in both Fourth Street and Concours Street. A 12-inch main in Fourth Street serves properties north of the Project site, in Rancho Cucamonga. An existing City of Ontario 18-inch main located in Fourth Street serves the Project site. Fourth Street also contains a 36-inch City of Ontario transmission main. Additionally, Concours Street contains a 16-inch water main that is used to serve the Project site. The POCA concludes that the existing water system infrastructure surrounding the general site is adequate to serve the Project area. Existing water infrastructure will be utilized to provide water to the proposed Project buildings.[5]

3.5.4.4 Recycled/Reclaimed Water System

Overview

The use of recycled water is regulated through the California Code of Regulations (CCR). Pertinent excerpts from Titles 17 and 22 of the CCR statutes are compiled in the California Health Laws related to Recycled Water, also referred to as "The Purple Book," which was updated in June 2001. The California Water Code (Section13550) states that use of potable water in instances where non-potable water applications are appropriate and feasible is “a waste of water if recycled water is of adequate quality and is available for these (non- potable) uses and can be furnished at a reasonable cost to the user.”

Use of recycled water is also feasible and recommended if it “is not detrimental to public health and will not adversely affect downstream water rights, degrade water quality, and is not injurious to plant life, fish, and wildlife.” In this regard, regulations and guidelines for recycled water and recycled water purveyors have been established by the California Department of Health Services (DHS) and are published in the CCR. These regulations and guidelines establish recycled water treatment requirements, quality standards, and source reliability criteria, thereby ensuring protection and preservation of the public health and welfare. The IEUA provides reclaimed water to the City of Ontario.

Water demands (potable and non-potable) are expected to increase in the City of Ontario concurrent with ongoing and increasing development pressures. Accordingly, and to release potable water supplies for applications where it is required, reclaimed water should increasingly replace use of potable water where use of non-potable water is determined to be feasible and appropriate. Non-potable water applications typically include irrigation, recreation lakes and ponds, cooling towers, air conditioners, evaporative condensers, flushing toilets, decorative fountains, commercial laundries, commercial car washes, washing down roads or sidewalks, and firefighting. The IEUA treats its wastewater to tertiary treatment standards including disinfections at four treatment plants.

[5] Final Environmental Impact Report (FEIR) No. 88-2 (Certified EIR) for The Ontario Center Specific, 1990.

Existing Reclaimed Water System

Nearest to the Project are the IUEA reclaimed water main which is installed in Sixth Street, a short segment of reclaimed water line in Haven Avenue between Sixth and Fourth Streets, with another segment located within Fourth Street west of Haven Avenue. More specifically, a 30-inch reclaimed water main exists in Haven Avenue, turning west in Fourth Street. A 12-inch reclaimed water lateral exists in Milliken that terminates near Fourth Street. An 8-inch dry reclaimed water line has been installed in the east portion of Concours, from station 65+09.72 near Founder's Park extending to Milliken Avenue. This dry reclaimed water line was installed as part of the Concours street improvements in 2002.

Reclaimed Water System Improvements

The POCA project constructed new reclaimed water facilities within the Project site, as well as construction of the remaining planned connecting segment(s) in Milliken, Concours and Haven. Reclaimed water system improvements realized under the POCA include the following:

- An extension of the reclaimed water lateral from Milliken Avenue and Fourth Street, connecting to the dry reclaimed water line in Concours Street.
- Construction of the remaining portion of the reclaimed water main in Concours Street from Haven Avenue, extending to station 65+09.72 near Founder's Fountain.
- Completed the reclaimed water loop by constructing a segment from Haven Avenue and Fourth Street extending to Concours Street.
- Construct a reclaimed water loop in Public Street "A" to each intersection of Concours Street.
- Reclaimed water distribution lines will be extended northerly from Concours Street into the Project site and will be located within Street "A" and Street "C."

Reclaimed water lines within public streets are maintained by the City of Ontario. According to the POCA, the ownership and maintenance of common reclaimed water system components and lines within the Project site will be the responsibility of the Piemonte at Ontario Center Property Owners Association, established pursuant to the Piemonte Covenants, Conditions & Restrictions (CC&R's).

3.5.4.5 Stormwater Management

The following discussions describe existing stormwater management facilities serving the Project area and identify stormwater conveyance facilities and stormwater quality treatment systems and management practices required of the Project. As a general note, Project-related improvements and connections located within public streets are maintained by the City. However, the ownership and maintenance of common stormwater system components and lines, as well as water quality treatment facilities within the Project site, are the responsibility of the Project.

3.5.4.6 Stormwater Collection and Conveyance Facilities

The proposed Project comprises the central portion of the OCSP. Drainage in the area flows in a generally north to south direction. North of the Project site, an existing storm drain is located in Fourth Street. This storm drain collects and transports all drainage flows from the north and west to Guasti Park. As such, the Project would not have to accommodate stormwater flows from the north. Stormwater runoff from the

Project site would drain southerly to Concours Street. Receiving reinforced concrete pipe(rcp) drainage facilities are located within Concours Street, and range in size from 48-inches in diameter to 72-inches in diameter. Flows from these Concours facilities empty into a 9-foot by 6-foot reinforced concrete box (rcb). Flows then continue southerly toward Inland Empire Boulevard, then westerly to Mercedes Lane, and then southerly beneath I-10 in a 12-foot by 7-foot rcb to Lower Deer Creek Channel. Lower Deer Creek Channel confluences with Cucamonga Creek Channel and flows to the Prado Basin.[6]

The POCA concluded that the existing storm drainage facilities serving the Project site and vicinity have been previously sized to accommodate the proposed development. The POCA noted that as part of the site development, there would be construction of additional internal drainage system improvements, which connect to the existing area-wide drainage system. Connection points to the existing system would have been located so as to take full advantage of available carrying capacities. Because the POCA proposed a higher intensity than the proposed Project, it is anticipated that stormwater collection and conveyance facilities would be adequate to accommodate the proposed Project.

3.5.4.7 Stormwater Treatment/Water Quality Management Plan (WQMP)

In addition to construction of required stormwater conveyance facilities described above, the City of Ontario and the governing Regional Water Quality Control Board (RWQCB) require that the Project incorporate certain stormwater quality treatment facilities and water quality management practices, as discussed below.

Overview

The Santa Ana RWQCB, under Order Number R8- 2002-0012, NPDES Permit No. CAS618036, requires post-construction Best Management Practices (BMPs) to be implemented for new development and significant redevelopment, for both private and public agency projects. The purpose of a Water Quality Management Plan (WQMP) is to develop and implement a program, including application of BMPs, which minimizes the potential detrimental effects of urban stormwater runoff on the beneficial uses of receiving waters, including potential effects of increased pollutant loads and changes in hydrology.

Potentially adverse effects on receiving waters may be minimized through the implementation of site designs which minimize impervious surface areas and maximize onsite infiltration, resulting in corollary reductions in total stormwater runoff discharge volumes and rates and associated pollutant transport. Potential impacts to receiving waters are further reduced through implementation of source control BMPs, on-site structural treatment control BMPS, and participation in regional or watershed based structural treatment control BMPs.

Previous development of the site realized under the POCA met applicable RWQCB criteria for preparation and implementation of a WQMP. In this regard, the proposed Project will also incorporate any combination of site designs, source controls, and/or treatment control BMPs. Stormwater quality and

[6] Final Environmental Impact Report (FEIR) No. 88-2 (Certified EIR) for The Ontario Center Specific, 1990.

treatment requirements may also be realized through Project participation in a regionally-based treatment program which addresses all identified pollutants and hydrologic conditions of concerns.

Project-related Stormwater Treatment Requirements

The proposed Project is located within the Santa Ana Basin, designated as Region 8 by the RWQCB, and is tributary to Lower Deer Creek, the Chris Basin, Cucamonga Creek Flood Control Channel, Mill Creek, the Prado Flood Control Basin, and finally the Santa Ana River. In accordance with the Clean Water Act, the State of California maintains a list of impaired water bodies and the pollutant causing the impairment. The Cucamonga Creek Flood Control Channel is included on the State's list of impaired water bodies because of high coliform content. Mill Creek is also included on the impaired water body's list for nutrients, suspended solids, and pathogens. Because these receiving waters (which are tributary to the Project) are impaired, the Project must incorporate BMPs that are rated high to medium in effectiveness for reducing the impairments. This assures a no net loading on the affected tributaries and ensures that there are no additional pollutants added to the already impaired water bodies. Additionally, this Project is subject to the latest trash capture requirements from the State and RWQCB.

Project-Related Stormwater Treatment Improvements

The proposed Project would accomplish mandated stormwater quality standards and mitigate pollutants of concern through the use of stormwater clarifiers and underground infiltration systems on each individual parcel. All proposed treatment facilities would be designed and implemented consistent with City and RWQCB requirements. Additionally, this Project shall implement the appropriate trash capture devices in order to comply with the latest trash capture requirements.

Based on the preceding discussion, the proposed Project would not result in any new, increased or substantially different impacts to utilities than those considered and addressed in the Certified EIR. No changes or additions to the Certified EIR analysis are necessary, nor is there a need for any additional mitigation measures. Please refer also to Addendum Section 3.5.1, Land Use and Planning**.**

3.5.5 Traffic and Circulation

The Certified EIR considered potential traffic/circulation impacts of the OCSP. To determine relative traffic impacts resulting from the Project vis-a-vis traffic/circulation impacts identified in the Certified EIR, a detailed analysis was conducted to determine the number of vehicular trips that will be generated by the proposed Project (please refer to the Traffic Impact Analysis prepared by RK Engineering Group, Inc., dated September 17, 2021, included in this Addendum as Appendix A). This trip generation was then compared to the potential trip generation of correlating maximum development intensities considered in the Certified EIR.

Specifically, Statistical Area "E" is listed in the OCSP as having an allowable maximum development intensity of 2,200,000 SF, while Statistical Area "D" is listed as having an allowable maximum development intensity of 640,000 SF. Land uses in both Statistical Areas are defined as "Urban Commercial." For the purposes of developing correlating trip generation rates, Project-related trip generation calculations

exclude areas within Statistical Areas E and D that are currently developed. As noted in the Statistical Areas included below:

- A 32-acre site between Fourth Street and Concours Street, on either side of Duesenberg Drive (known as the Fairfield/Sares-Regis development which includes 800 multi-family DUs located within Statistical Area D).
- An approximately 26-acre parcel (Parcel 7) north of Concours Street that has been developed by the City of Ontario with an arena within Statistical Area E.
- A site in the south-west quadrant of the intersection of Milliken Avenue and Fourth Street, which has been developed with just under 108,000 square feet of retail/restaurant uses anchored by a Kohl's' department store located within Statistical Area E.

Traffic generation for the OCSP is shown in **Table 3-1**, *Summary of OCSP Trip Generation,* below:

Table 3-1: Summary of OCSP Trip Generation

Development	Land Use (ITE Code)	Quantity	Units 2	AM			PM			Daily
				In	Out	Total	In	Out	Total	
OCSP Assumptions										
Urban Commercial (OCSP Stat. Area E)	General Retail	2,220.000	TSF	1,382	884	2,266	3,960	4,290	8,250	94,468
Urban Commercial (OCSP Stat. Area D)	General Retail	640.000	TSF	402	257	659	1,152	1,248	2,400	27,482
Specific Plan Trip Generation Total				**1,784**	**1,141**	**2,925**	**5,112**	**5,538**	**10,650**	**121,950**

1 Source:
Piemonte at Ontario Center Addendum. February 2006. Table 1, Ontario Center Specific Plan (OCSC) Project Trip Generation, page 136.

2021 ITE Trip Generation Manual (11th Edition)
2 TSF = Thousand Square Feet
DU = Dwelling Units
3 Source: 2017 ITE Trip Generation Manual (10th Edition)

As noted in **Table 3-2**, above, Statistical Areas " D and E" were anticipated to generate 121,950 weekly trips, with 2,925 Weekday AM Peak Hour trips and 10,650 Weekday PM Peak Hour trips. **Table 3-2*, Summary of OCSP Project Trip Generation Available for Future Land Uses,*** shows the trip generation assumed to be available for other/new projects to be developed within Statistical Areas "D and E" of the OCSP. In this instance, the proposed Project's forecast trip generation would be compared against the trip generation assumed to be available for other/new projects, as shown in **Table 3-2**, below.

Table 3-2: Summary of OCSP Project Trip Generation Available for Future Land Uses

Development	Land Use (ITE Code)	Quantity	Units2	AM			PM			Daily
				In	Out	Total	In	Out	Total	
OCSP Assumptions										
Urban Commercial (OCSP Stat. Area E)	General Retail	2,220.000	TSF	1,382	884	2,266	3,960	4,290	8,250	94,468
Urban Commercial (OCSP Stat. Area D)	General Retail	640.000	TSF	402	257	659	1,152	1,248	2,400	27,482
Specific Plan Trip Generation Total				**1,784**	**1,141**	**2,925**	**5,112**	**5,538**	**10,650**	**121,950**

Development	Land Use (ITE Code)	Quantity	Units2	AM			PM			Daily
				In	Out	Total	In	Out	Total	
OCSP Assumptions										
Developed / Planned Areas										
955 N. Diesenberg Dr. (Vintage Apartments)	Multifamily Housing (Low-Rise) (220)	309	DU	30	94	124	99	58	157	2,083
950 N. Diesember Dr. (Camden Landmark Apartments)	Multifamily Housing (Low-Rise) (220)	491	DU	47	149	196	158	93	251	3,309
4000 E. Ontario Center Parkway (Arena)	Arena (460)[3]	8,000	Seats	NA	NA	NA	374	666	1,040	NA
901 N. Via Piemonte (5-Story Office)	General Office (710)	125.685	TSF	168	23	191	31	150	181	1,362
900 N. Via Piemonte (Marriott - Element Ontario Hotel)	Hotel (310)	131	Rooms	34	27	61	39	38	77	1,047
1051 N. Milliken Ave. (Kohl's)	Shopping Center (820)	96.736	TSF	50	31	81	158	171	329	3,580
1041 N. Milliken Ave. (Starbucks)		1.500	TSF	1	0	1	2	3	5	56
1021 N. Milliken Ave. (Applebee's)		4.603	TSF	2	1	3	8	8	16	170
4290 E. Fourth St. (El Pollo Loco)		2.406	TSF	1	1	2	4	4	8	89
4275 E. Concours St. (Home Thai/Professional Nail/Sunrise Optometry)		8.528	TSF	4	3	7	14	15	29	316
4295 E. Concours St. (Comerica Bank)		3.262	TSF	2	1	3	5	6	11	121
4150 E. Fourth St. (Spa/Wax Center/Weight Watchers)		8.385	TSF	4	3	7	14	15	29	310
4190 E. Forth St. (Jeweler/Hair Salon/Dentist)		7.320	TSF	4	2	6	12	13	25	271
4240 E. Fourth St. (Wells Fargo)		4.845	TSF	3	2	5	8	9	17	179
4120 E. Fourth St. (Big Al's/Petsmart/DSW Shoes)		91.280	TSF	48	29	77	149	161	310	3,378
4200 E. Fourth St. (Target and Garden Center)		151.741	TSF	79	48	127	248	268	516	5,616
SWC of N. Via Alba & E. Via Villagio	Multifamily Housing (Low-Rise) (220)	72	DU	7	22	29	23	14	37	485
NEC of Ontario Center Parkway & N.	Multifamily Housing (Low-	110	DU	11	33	44	35	21	56	741

Development	Land Use (ITE Code)	Quantity	Units2	AM			PM			Daily
				In	Out	Total	In	Out	Total	
OCSP Assumptions										
Via Alba	Rise) (220)									
Used-Up Allocation of Trips Total				**495**	**469**	**964**	**1,381**	**1,713**	**3,094**	**23,113**
Trips Available for Future Uses				**1,289**	**672**	**1,961**	**3,731**	**3,825**	**7,556**	**98,837**

1 Source:
Piemonte at Ontario Center Addendum. February 2006. Table 1, Ontario Center Specific Plan (OCSC) Project Trip Generation, page 136.
2021 ITE Trip Generation Manual (11th Edition)
2 TSF = Thousand Square Feet
DU = Dwelling Units
3 Source: 2017 ITE Trip Generation Manual (10th Edition)

As shown in **Table 3-2**, above, trip generation rate available for future uses include 98,837 Weekday Daily Trips, including 1,961 Weekday AM Peak Hour Trips and 7,556 PM Peak Hour Trips.

As discussed within this Addendum Section 3.0, "Environmental Analysis," total average daily traffic that would be generated by the proposed Project is forecast at 6,447 Weekday Daily Trips which include approximately 315 AM Peak Hour Trips and approximately 575 PM Peak Hour Trips. Additionally, the proposed Project is forecast to generate approximately 6,677 Saturday daily trips which include approximately 624 Saturday Peak Hour Trips.

After accounting for internal trip capture and applicable Institute of Transportation Engineers (ITE) pass-by trip rates, the proposed Project is forecast to generate approximately 5,691 Weekday Daily Trips with 300 Weekday AM Peak Hour Trips, and approximately 458 Weekday PM Peak Hour Trips. An internal trip capture reduction is applicable when a project site has more than one destination (such as the proposed Project), in which a person visits more than one destination onsite during the same visit.

Additionally, the proposed Project is forecast to generate approximately 5,813 Saturday daily trips which include approximately 490 Saturday Peak Hour trips. Compared to the originally anticipated and approved trip generation forecast for the Certified EIR/OCSP, the proposed Project would generate approximately 4.6 percent of the overall weekday daily trips and only 4.7 percent of Saturday trips compared to the Certified EIR/OCSP approved project.

Regarding the overall development intensity, the proposed Project is anticipated to be approximately 72 percent less intense than the OCSP, or only about 28 percent of the intensity would otherwise result under buildout of the Project site under the proposed Project per the maximum development intensities allowed under the OCSP for Statistical Areas "D and E."

Development intensity of the Project site, as characterized by traffic generation and intensity, is therefore substantially reduced when compared to maximum allowable development intensities identified under the OCSP. This reduction in traffic generation rates is due largely to the fact that the Project will implement an integrated lower residential component than the originally allowed under the OCSP, the POCA and the POOC, which would result in substantially reduced Daily and, AM and PM Peak Hour Trip generation rates compared to trip generation rates that would result from maximum allowable commercial intensities on the same acreage under the Certified EIR and the subsequently approved addendums.

In accordance with the Project site plan and land use concepts, the proposed Project will realize a mixed-use development of approximately 71,200 SF of commercial and up to 694 multi-family units. Detailed trip generation calculations for the Project land uses are included in the Traffic Impact Analysis, provided as Appendix A to this Addendum, and the relevant trip generation information is summarized in **Table 3-3,** *Comparison of Weekday Peak Hour Trip Generation.*

Table 3-3: Comparison of Weekday Peak Hour Trip Generation

Trip Generation Comparison	Daily	A.M. Peak Hour	P.M. Peak Hour
Allowable trips per Ontario Center Specific Plan (OCSP) [1]	98,837	1,961	7,556
Total Net Adept-Piemonte Trips [2]	5,691	300	458
Trip Generation Difference Between OCSP and Adept-Piemonte	93,146	1,661	7,098
Percent of Trips Used by Adept-Piemonte Project	6.1%	18%	6.4%
Source: Piemonte at Ontario Center Addendum. 2006. Table 3-2, Comparison of Weekday Trip Generation. Page 3-16.			

As presented in **Table 3-3**, above, total average daily trips generated by the Project is approximately 95 percent less than would otherwise result under buildout of the subject site per the maximum development intensities allowed under the OCSP and considered in the Certified EIR. Project related AM Peak Hour Trip generation is forecast to be only 18 percent of the allowable trips or 82 percent less than the maximum allowed under the OCSP. Similarly, the PM Peak Hour Trip generation forecast for the Project is 6.4 percent of the allowable trips or 93.6 percent less than the maximum development allowed under the OCSP.

The trip generation data summarized in Table 3-3 indicates that the Project would not exceed the total daily, nor peak-hour trip generation estimates resulting from maximum allowable development intensities considered and addressed in the Certified EIR. On this basis, the Project will not generate new or additional traffic or transportation impacts that were not previously identified in the Certified EIR. No changes or additions to the Certified EIR analysis are necessary, nor is there a need for any additional mitigation measures.

3.5.5.1 CEQA VEHICLE MILES TRAVELED ANALYSIS

In response to SB 743, the CNRA certified and adopted new CEQA Guidelines in December 2018 which now identify VMT as the most appropriate metric to evaluate a project's transportation impact under CEQA (Section 15064.3).

Effective July 1, 2020, the previous CEQA metric of LOS, typically measured in terms of automobile delay, roadway capacity and congestion, generally will no longer constitute a significant environmental impact. The City of Ontario has adopted guidelines to provide recommendations and methodology and thresholds of significance for identifying VMT related impacts. The proposed Project is subject to a VMT analysis and will adhere to the recommendations and practices described in the City of Ontario Planning Commission Resolution No. PC20-021 (May 26, 2020).

Based on the analysis methodology described in the City of Ontario's adopted Planning Commission Resolution regarding VMT, project screening procedures have been implemented to identify projects that may be presumed to have a less than significant impact absent substantial evidence to the contrary and

will be exempted from further project-level VMT assessment. According to the City's guidelines, land use projects located within a Transit Priority Area (TPA) and that have the following characteristics are presumed to have a less than significant impact absent substantial evidence to the contrary:

- Has a Floor Area Ratio of 0.75 or higher;
- Includes no more parking for residents, customers, or employees than the City Development Code mandates;
- Is consistent with the Sustainable Communities Strategy (SCS) as determined by the City with input from the Southern California Association of Governments (SCAG) or San Bernardino County Transportation Authority (SBCTA); and
- If there are existing affordable residential units, replaces those residential units with at least as many similarly affordable units and not with a smaller number of moderate or high-income residential units.

Based on the Project site plan, the proposed Project encompasses the following Assessor Parcel Numbers shown in **Table 3-4***, Parcel Numbers*.

Table 3-4: Parcel Numbers

Lot	Assessor Parcel Number (APN)
A & B	021-020-501
C	021-020-438
D	021-020-438
F	021-020-412-15
G	021-020-420-25

Hence, the VMT analysis examined in this study focuses on the land use components from Lot A, Lot B, Lot C, and Lot D. After utilizing the SBCTA VMT Screening Tool, all Project parcels, with the exception of a portion of Parcel F of the proposed Project, are located within a TPA and therefore do not require a VMT analysis.

The portion of Parcel F which is not within the TPA is not planned to consist of any trip-generating land uses as those portions of the site will only be used to relocate some of the existing parking capacity on the Project site. Hence, those non-TPA areas are not subject to VMT analysis. Additionally, the proposed Project is expected to implement the following design features identified in the Toyota Arena Mixed-Use Development Air Quality and Greenhouse Gas Impact Study, City of Ontario, California, June 4, 2021. The following Project design features are trip reduction measures to reduce the number of auto-based trips and encourage the use of transit, bicycling, and walking:

1 Improve the walkability and design of the Project by including pedestrian and bicycling connections within the Project site and to adjacent off-site facilities (i.e., sidewalks, crosswalks, footpaths, protected bike lanes, multi-purpose trails, direct parcel-to-parcel connections, wayfinding signage, etc.).

2 Provide traffic calming measures (i.e., marked crosswalks, raised crosswalks, raised intersections, count-own signal timers, curb extensions, speed tables, median islands, tight

corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, etc.).

3 Provide bicycle racks for the retail and commercial uses and secure bicycle parking areas for the office and residential uses.

In addition, the PA VMT Per Population and PA VMT Per Worker is lower than the jurisdiction average VMT. Therefore, the proposed Project is found to have a *less than significant VMT impact.*

3.5.6 Biological Resources

The Certified EIR addressed potential biological resources impacts of the OCSP, including potential impacts to native plants and wildlife species. Due to the site's previous uses (including operation of the Ontario Motor Speedway, along with agricultural and industrial uses) the site was found to be extremely disturbed. The Certified EIR notes that "Due to the lack of native vegetation and the disturbed nature of the site, no unique (listed or candidate) species of plants or animals were observed or are anticipated." (EIR 88-2, Page III-65). No impacts were identified, and no mitigation measures were proposed.

The scope and character of the proposed Project development are consistent with the type and scope of development considered in the Certified EIR, and as such would not result in new, additional, or different impacts to biological resources than were considered and addressed in the Certified EIR. No changes or additions to the Certified EIR analysis are necessary.

3.5.7 Air Quality

A Project specific Air Quality and Greenhouse Gas Impact Study was prepared by RK Engineering Group, Inc. Findings are summarized herein, and the technical study is available as Appendix B of this Addendum.

The Certified EIR considered potential air quality impacts resulting from the OCSP. Temporary air quality impacts were anticipated to result from Project construction activities, which include preparation of the Project site, and construction of the proposed commercial, residential, and supporting facilities. During construction, air pollutants would be emitted by construction equipment. Dust (PM_{10} emissions) would also be generated by grading and site preparation activities.

The Certified EIR addresses construction-related air quality impacts as follows:

> "Construction emissions will be short-term. Pollutants from construction-related activities are from final site development on 560 acres over an undefined time period. The Ontario Center will ultimately be a mixed-use development on 700 acres. The generally referenced full buildout date is 2010. Presently, portions of the site are in varying stages of development including constructed buildings and roadways. Additionally, the entire site has already been "rough" graded, meaning approximately 75 percent of construction-related activities have been conducted (i.e., excavations, the removal and transport of material and the construction of building pads). (*The Ontario Center EIR*, page III-13)."

As noted in the discussion of traffic and circulation presented in Addendum Section 3.5.5, a reduction in traffic is projected to occur when comparing the proposed Project operations to maximum development intensities considered in the Certified EIR; thus, no increase in mobile air emissions is expected to occur.

Operational emissions resulting from the consumption of natural gas and electricity by new project-related land uses (area sources) were also estimated within the Certified EIR. As the proposed Project would realize an overall reduction in development intensity when compared to the maximum allowable intensities considered in the Certified EIR, area source emissions would be no greater than, and would likely be reduced when compared to emissions estimates presented in the Certified EIR. It is also noted that on a project-by-project basis, area source emissions are incrementally insignificant when compared to mobile source emissions, and typically account for less than one percent of a given project's total operational emissions. Therefore, any potential increase in area source emissions resulting from the proposed Project would be more than offset by the projected reduction in mobile source emissions. It is further noted, that in providing an integrated mix of residential and commercial products, the proposed Project establishes and supports land use plans that act to reduce commute distances, with correlating reductions in vehicle source emissions. The Project specific Air Quality and Greenhouse Gas Impact Study concluded the following regarding Mobile Source Emissions:

Mobile Source Emissions

Mobile source emissions are the largest source of long-term air pollutants from the operation of the Project. Mobile sources are direct sources of Project emissions that are primarily attributed to tailpipe exhaust and road dust (tire, brake, clutch, and road surface wear) from motor vehicles traveling to and from the site. Estimates of mobile source emissions require information on four parameters: trip generation, trip length, vehicle/fleet mix, and emission factors (quantity of emission for each mile traveled or time spent idling by each vehicle). The trip generation rates, trip length and trip percentages for the Project are based on the latest version of the Toyota Arena Mixed Use Development Traffic Impact Study Scoping Agreement, by RK, May 2021 and SBCTA VMT Tool7.[7]

The Emission Factors (EMFAC2017) 2017 model and off-model adjustments factors to account for the Statistical AreaFE Vehicle Rule is used to estimate the mobile source emissions that are embedded in the CalEEMod emissions model. No adjustments have been made to default emission factors. The Project's total VMT estimated by CalEEMod is shown in the **Table 3-5***, Operational Vehicle Miles Traveled,* for this project.

Table 3-5: Operational Vehicle Miles Traveled

Land Use	Annual VMT
Multi-family Mid-Rise[1]	5,682,657
Commercial/Retail Center	4,539,098
Total	**10,221,755**

Source: RK Engineering. Air Quality and GHG Analysis. *Table 10, Operational Vehicle Miles Traveled*.
[1] The VMT estimates for residential home-based trips are based on estimates from the SBCTA VMT Tool, which shows daily home-based VMT per capita for TAZ 53690101 of 7.9 VMT per population for model year 2023.

[7] SBCTA VMT Screening Tool. https://devapps.fehrandpeers.com/sbctavmt/

The operational vehicle fleet mix has been adjusted to reflect vehicle types used for typical residential home-based trips and the commercial/retail and office trips generated by the Project. The SCAG regional travel demand model does not include heavy-duty trucks, buses or other large vehicles that would require passenger car equivalent (PCE) adjustments for residential home-based trips.

The proposed Project does not consist of land uses that would typically require PCE adjustments to account for large trucks, such as warehousing. To be conservative, the Air Quality/GHG analysis has assumed that two percent of the total residential home-based trips and commercial/retail and office trips will include trucks with a gross vehicle weight rating (GVWR) of 10,000 pound or greater. This includes LHD2, MHD, HHD, OBUS, UBUS, and SBUS vehicles. The 2% mix is also consistent with the default Highway Capacity Manual (HCM) assumptions. The adjusted vehicle mix is proportioned according to the default CalEEMod vehicle mix.

Air Quality Regional Significance Thresholds

The SCAQMD has established air quality emissions thresholds for criteria air pollutants for the purposes of determining whether a project may have a significant effect on the environment per Section 15002(g) of the Guidelines for implementing CEQA. By complying with the thresholds of significance, the Project would be in compliance with the SCAQMD Air Quality Management Plan (AQMP) and the federal and state air quality standards. **Table 3-6*, SCAQMD Regional Significance Air Quality Thresholds***, lists the air quality significance thresholds for the six air pollutants analyzed in this report. Lead is not included as part of this analysis as the Project is not expected to emit lead in any significant measurable quantity.

Table 3-6: SCAQMD Regional Significance Air Quality Thresholds

Pollutant	Construction (lbs/day)	Operation (lbs/day)
NOx	100	55
VOC	75	55
PM_{10}	150	150
$PM_{2.5}$	55	55
SOx	150	150
CO	550	550
Source: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significancethresholds.pdf		

Short Term Air Quality Impacts – Construction

Daily Emissions - Construction

Daily air quality emissions include both on-site and off-site emissions associated with construction of the Project. Regional daily emissions of criteria pollutants are compared to the SCAQMD thresholds of significance.

As shown in **Table 3-7*, Daily Construction Emissions,*** daily emissions of criteria pollutants are expected to be below the allowable thresholds of significance. CalEEMod daily emissions outputs are provided in Appendix A of the Air Quality and Greenhouse Gas Emissions Impact Study, provided as Appendix B to this Addendum.

Table 3-7: Daily Construction Emissions

Maximum Daily Emissions (lbs/day)[1,2]						
Activity	**VOC**	**NOx**	**CO**	**SO_2**	**MP_{10}**	**$PM_{2.5}$**
Demolition	0.91	14.16	26.89	0.09	7.84	1.56
Site Preparation	0.55	2.08	21.68	0.04	7.78	3.98
Grading	0.85	3.36	33.90	0.06	3.85	1.56
Building Construction	4.86	17.12	60.88	0.16	11.46	3.28
Paving	1.29	1.25	17.86	0.02	0.21	0.08
Architectural Coating	70.26	0.56	8.39	0.02	1.96	0.53
Maximum[1]	**70.26**	**17.12**	**60.88**	**0.16**	**11.46**	**3.98**
SCAQMD Threshold	75	100	550	150	150	55
Exceeds Threshold?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Source: RK Engineering. Air Quality and GHG Analysis. *Table 13, Daily Construction Emissions.*
Notes:
DU: Dwelling Unit(s)
SF: Square Feet

The Project must follow mandatory SCAQMD rules and requirements with regards to fugitive dust control, as described in Section 6.1.3 of the SCAQMD rules. Compliance with the standard dust control measures is considered to be part of the conditions of approval for the Project and built into the design features. Table 3-7, above, shows that, the Project's daily construction emissions would be below the applicable SCAQMD air quality standards and thresholds of significance. As a result, the Project would not contribute substantially to an existing or projected air quality violation.

Furthermore, by complying with the SCAQMD standards, the Project would not contribute to a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors). The Project's short-term construction impact on regional air resources would be less than significant.

On the basis of the preceding discussions, the proposed Project does not create new, additional, or substantially different air quality impacts than were considered and addressed in the Certified EIR. No changes or additions to the Certified EIR analysis are necessary.

3.5.8 Noise

A Project specific Noise Impact Study was prepared by RK Engineering Group, Inc. Findings are summarized herein, and the technical study is available as **Appendix C** to this Addendum.

The Certified EIR considered potential noise impacts resulting from implementation and operations of the OCSP and identified two characteristic noise sources typically identified with land use intensification. These include construction activities, especially heavy equipment, which will create short-term noise increases, and operational noise, including noise generated by traffic (mobile sources) and on-site facilities (area sources). In addition, sources of existing noise affecting the Project area are assessed, including vehicular noise from surrounding roadways.

3.5.8.1 Potential Off-site Noise Impacts

Since the Certified EIR was adopted, numerous development projects have been approved and constructed in the Project vicinity, including residential uses, which are considered to be noise-sensitive receptors. Residential uses that may be affected by Project-related noise include the adjacent Fairfield/Sares-Regis residential project, and to lesser extent, residential uses located northerly of Fourth Street within the neighboring City of Rancho Cucamonga.

Potential Construction Noise and Vibration Impacts

Construction equipment, activities, and techniques required to construct the Project are consistent with the character and extent of construction methodologies considered in the Certified EIR. That is, the Project would not require, nor employ extraordinary construction techniques nor unusual construction equipment that would generate noise not previously considered in the Certified EIR. Nor would the Project result in construction beyond the physical limits of construction considered in the Certified EIR. As such, construction-related noise sources and noise levels would not be substantially greater, nor different than, those previously considered and addressed in the Certified EIR.

It is also important to note that noise-intensive construction activities are limited in duration to the construction period; and, except in unusual circumstances, noise-producing construction activities typically end by 4:00 p.m. The Project is also required to comply with construction time limitations established by the City Noise Ordinance, which limitations act to reduce the extent, intensity, and duration of construction noise during noise-sensitive morning and evening hours, as well as on weekends and holidays. On the basis of the preceding discussions, the proposed Project would not result in new, additional, or substantially different off-site construction-related noise impacts than were considered and addressed in the Certified EIR.

Construction and Vibration Impacts

Temporary construction noise and vibration impacts have been assessed from the Project site to the nearest sensitive residential use to the north of Lot F and Lot G. The degree of construction noise would vary depending on the type of construction activity taking place and the location of the activity relative to the surrounding properties. Chapter 29: Noise, Section 5-29.06 of the City's municipal code states that the following activities shall be exempted from the provisions of the noise code.

- Noise sources associated with construction, repair, remodeling, demolition or grading of any real property. Such activities shall instead be subject to the following provisions of § 5-29.09;
    - No person, while engaged in construction, remodeling, digging, grading, demolition or any other related building activity, shall operate any tool, equipment or machine in a manner that produces loud noise that disturbs a person of normal sensitivity who works or resides in the vicinity, or a Police or Code Enforcement Officer, on any weekday except between the hours of 7:00 a.m. and 6:00 p.m. or on Saturday or Sunday between the hours of 9:00 a.m. and 6:00 p.m.

- No landowner, construction company owner, contractor, subcontractor, or employer shall permit or allow any person or persons working under their direction and control to operate any tool, equipment, or machine in violation of the provisions of this section.

To help further assess potential construction noise level impacts under CEQA, the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment (2006) criteria is used as a referenced threshold of significance in this report. The FTA provides reasonable criteria for assessing construction noise impacts based on the potential for adverse community reaction. For residential uses, the daytime noise threshold is 80 dBA Leq for an 8-hour period. In compliance with the City's Municipal Code, it is assumed construction would not occur during the noise-sensitive nighttime hours.

Typical Construction Noise Levels

Table 3-8*, Typical Construction Noise Levels*, shows typical construction noise levels compiled by the Environmental Protection Agency (EPA) for common type construction equipment. Typical construction noise levels are used to estimate potential project construction noise levels at the adjacent sensitive receptors.

Table 3-8: Typical Construction Noise Levels

Type	Noise Levels (dBA) at 50 Feet
Earth Moving	
Compactors (Rollers)	73 – 76
Front Loaders	73 – 84
Backhoes	73 – 92
Tractors	75 - 95
Scrapers, Graders	78 – 92
Pavers	85 – 87
Trucks	81 – 94
Materials Handling	
Concrete Mixers	72 – 87
Concrete Pumps	81 – 83
Cranes (Movable)	72 – 83
Cranes (Derrick)	85 – 87
Stationary	
Pumps	68 - 71
Generators	71 – 83
Compressors	75 - 86
Impact Equipment	
Pneumatic Wrenches	82 – 87
Jack Hammers, Rock Drills	80 – 99
Pile Drivers (Peak)	95 – 105
Other	
Vibrators	62 – 82
Saws	71 - 82

Source: RK Engineering. Noise Analysis. *Table 17, Typical Construction Noise Levels.*
Referenced Noise Levels from the Environmental Protection Agency (EPA)

Construction Noise Impact Analysis

The assessment analyzed potential noise impacts during all expected phases of construction, including: demolition, site preparation, grading, building construction, paving, and architectural coating. Construction phasing and equipment usage assumptions are referenced from the Air Quality and Greenhouse Gas Impact Study provided as Appendix B to this Addendum.

The Project's estimated construction noise levels have been calculated using the Federal Highway Administration (FHA) Roadway Construction Noise Model Version 1.1. **Table 3-9*, Project Construction Noise Levels – Residential Uses to the North,*** shows the noise level impacts to the nearest residential property lines to the north at 160 feet.

Table 3-9: Project Construction Noise Levels – Residential Uses to the North

Phase	Equipment	Quantity	Equipment Noise Level at 160 ft (dBA Leq)	Combined Noise Level (dBA Leq)
Demolition	Concrete/Industrial Saw	1	72.5	76.3
	Excavator	3	66.6	
	Rubber Tired Dozer	2	67.6	
Site Preparation	Rubber Tired Dozers	3	67.6	77.5
	Tractors/Loaders/Backhoes	4	69.9	
Grading	Excavators	2	66.6	78.1
	Graders	1	70.9	
	Rubber Tired Dozers	1	67.6	
	Scrappers	2	69.5	
	Tractors/Loaders/Backhoes	2	69.9	
Building Construction	Cranes	1	62.5	78.1
	Forklifts	3	60.9	
	Generator Sets	1	67.5	
	Tractors/Loaders/Backhoes	3	69.9	
	Welders	1	59.9	
Paving	Cement and Mortar Mixer	2	64.7	71.8
	Pavers	2	64.1	
	Paving Equipment	2	62.9	
Architectural Coating	Air Compressor	1	63.6	63.6
Worst Case Construction Phase Noise Level – Leq (dBA)				78.1
FTA Construction Noise Criteria (Detailed Assessment: 8 Hour Leq)				80.0
Noise Level Exceeds FTA Criteria?				**No**
Source: RK Engineering. Noise Analysis. *Table 18, Project Construction Noise Levels – Residential Uses to the North.*				

As shown in **Table 3-9**, above, Project construction noise levels are expected to be below the recommended 8-hour construction noise threshold provided by the FTA for adverse community reaction at the adjacent residential uses.

Construction Vibration

To determine the vibratory impacts during construction, reference construction equipment vibration levels were utilized and then extrapolated to the façade of the nearest adjacent structures. The nearest sensitive receptors are the commercial/retail structures located adjacent to the Project site. All structures surrounding the Project site are "new structures." No historical or fragile buildings are known to be located within the vicinity of the site.

The construction of the proposed Project is not expected to require the use of substantial vibration inducing equipment or activities, such as pile drivers or blasting. The main sources of vibration impacts during construction of the Project would be the operation of equipment such as bulldozer activity during demolition, loading trucks during grading and excavation, and vibratory rollers during paving. The construction vibration assessment utilizes the referenced vibration levels and methodology set forth within the Transit Noise and Vibration Impact Assessment Manual, FTA, September 2018. **Table 3-10***,* ***Typical Construction Vibration Levels,*** shows the referenced vibration levels.

Table 3-10: Typical Construction Vibration Levels

Equipment	Peak Particle Velocity (PPV) (inches/seconds) at 25 feet	Approximate Vibration Level (LV) at 25 feet
Piledriver (impact)	1.518 (upper range)	112
	0.664 (typical)	104
Piledriver (sonic)	0.734 upper range	105
	0.170 typical	93
Clam shovel drop	0.202	94
Hydromill	0.008 in soil	66
(slurry wall)	0.017 in rock	75
Vibratory roller	0.210	94
Hoe ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

Source: RK Engineering. Noise Analysis. *Table 19, Typical Construction Vibration Levels.*
[1] Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, September 2018

Table 3-11*, Construction Vibration Impact Analysis,* shows the Project's construction-related vibration analysis at the nearest structures to the Project construction area. Construction impacts are assessed from the closest area on the Project site to the nearest adjacent structure at approximately 50 feet. The worst-case vibratory impact from the site is estimated to be 0.098 PPV (in/sec) at the structures to the west. No damage potential is expected.

Table 3-11: Construction Vibration Impact Analysis

Construction Activity	Distance Nearest Structure (ft)	Duration	Calculated Vibration Level - PPV (in/sec)	Damage Potential Level	Annoyance Criteria Level
Large Bulldozer	50	Continuous/Frequent	0.042	No Impacts	Distinctly Perceptible
Vibratory Roller	50	Continuous/Frequent	0.035	No Impacts	Barely Perceptible
Loaded Trucks	50	Continuous/Frequent	0.098	Extremely Fragile Buildings, Ruins, Ancient Mountains	Distinctly Perceptible
Caisson Drilling	50	Continuous/Frequent	0.042	No Impacts	Distinctly Perceptible

Source: RK Engineering. Noise Analysis. *Table 20, Construction Vibration Impact Analysis.*

As shown in **Table 3-11**, above, Project related construction activity is not expected to cause any potential damage to the nearest structures. The annoyance potential of vibration from construction activities would range from "distinctly perceptible" to "barely perceptible." Construction vibration calculation worksheets are shown in Appendix D of the Noise Study, provided as Appendix C of this Addendum.

Operational Noise

With regard to operational noise, land uses proposed by the Project are consistent with development envisioned under the OCSP, and overall development intensities resulting from the Project are less than the maximum allowable development intensities for Statistical Areas D and E, as assessed in the Certified EIR. As such, the traffic and attendant vehicular noise from both passenger vehicles and delivery operational noise can be expected to be similar, but not greater than that presented in the Certified EIR.

Stationary Source Noise Impacts

The Project is not expected to consist of significant sources of stationary noise. The main sources of potential stationary noise impacts from the Project would mainly include on-site circulation and parking lot noise, Heating, Ventilation and Air Conditioning (HVAC) units and outdoor conversational noise.

The types of on-site noise from the Project are typically considered compatible with other adjacent commercial/mixed use and would not typically be categorized as loud, unnecessary, or unusual noise that disturbs the peace or quiet of any neighborhood, or that causes discomfort or annoyance to any person of normal sensitiveness. In particular, social activities and vehicular related noise are generally substantially less during the noise sensitive nighttime hours. Although, mechanical HVAC equipment does have the potential to operate 24-hours a day.

Rooftop mechanical HVAC equipment are expected to be located at the center of each building. The nearest noise sensitive residential receptors are located approximately 750 feet away to the west of the proposed Lot C HVAC units and the noise impacts from the operation of mechanical HVAC equipment is expected to not be significant at this distance. Therefore, a preliminary evaluation of noise impacts at the adjacent commercial uses has been provided.

Parking lot noise would occur from vehicle engine idling and exhaust, doors slamming, tires screeching, people talking, and the occasional horn honking. Parking lot noise is expected to occur on Lot F and Lot G and is conservatively assessed from the first parking space to northern residential properties; approximately 160 feet away. The site plan shows commercial/retail uses would face Via Piemonte and would be mostly shielded from the line of sight from the adjacent receptor property lines. Therefore, the outdoor conversational noise from the commercial/retail uses would not substantially contribute noise impacts to adjacent properties and was not included as a part of this analysis. Refer to **Table 3-12**, ***Stationary Noise Impact Analysis***.

Table 3-12: Stationary Noise Impact Analysis[1]

Receptor			Stationary Noise Source				Combined Exterior Noise Level (Leq) dBA	
Number[2]	LU	Location	Source	Location	Distance[3]	Noise Level (Leq) dBA	Daytime[4]	Nighttime[4]
1	R	North of Lot F & G	Parking Lot	Lot F & G	160	34.8	34.8	34.8
2	R	West of Lot C	HVAC	Lot C	510	32.2	32.6	32.6
			Parking Lot	Lot F	735	21.9		
City of Ontario Residential Exterior Standard Levels							**65.0**	**50.0**
Noise Level Exceed Standard (?)							**No**	**No**
3	C	South of Lot C & D	HVAC	Lot A	213	39.6	43.7	43.7
			HVAC	Lot C	243	38.5		
			HVAC	Lot D	243	38.5		
			Parking Lot	Lot F & G	530	24.7		
4	C	East of Lot D	HVAC	Lot D	485	32.7	36.6	36.6
			Parking Lot	Lot G	170	34.3		
5	C	East of Lot A	HVAC	Lot A	213	39.6	42.4	42.4
			HVAC	Lot B	525	39.1		
6	C	South of Lot B	HVAC	Lot A	580	31.1	39.0	39.0
			HVAC	Lot B	250	38.2		
City of Ontario Residential Exterior Standard Levels							**65.0**	**60.0**
Noise Level Exceed Standard (?)							**No**	**No**

Source: RK Engineering. Noise Analysis. *Table 14, Stationary Noise Impact Analysis.*
[1] Stationary noise calculation worksheets are shown in Appendix C.
[2] Refer Exhibit A for Receptor Location.
[3] Distance from the receptor to the nearest noise source.
[4] Daytime: (7:00 A.M. to 10:00 P.M.); Nighttime: (10:00 P.M. to 7:00 A.M.

As shown in **Table 3-12**, above, operational noise levels generated by the proposed Project are not expected to exceed the City's daytime standards and nighttime noise standards at the nearest receptor property line for both commercial and residential uses. Stationary noise calculation worksheets are shown in Appendix C of the Noise Impact Study provided as Appendix C of this Addendum.

Preliminary Interior Noise Analysis

Traffic noise along the adjacent roadways is expected to be the primary source of ambient noise impacting future residents at the Project site. Traffic noise is analyzed to determine the Project's noise/land use compatibility setting and to determine future noise levels to habitable exterior and interior areas on the

Project site. This section of the analysis does not necessarily apply to CEQA, as recent court rulings have indicated that CEQA is primarily concerned with the project's impact of the environment, not the environment's impact on a Project.

Future traffic noise along the roadways is obtained from The Ontario Plan Figure S-3a, Future Roadway Noise Contours and represents the noise levels at the Project site. **Table 3-13** shows the estimated future traffic noise levels at the Project site and the noise/land use compatibly rating based on the City of Ontario General Plan Table LU-7 standards; refer to **Table 3-13, *Future Traffic Noise Levels***. The Ontario Plan Noise Level Exposure and Land Use Compatibility Guidelines is provided in Appendix A of the Noise Analysis Study, provided as **Appendix C** of this Addendum.

Table 3-13: Future Traffic Noise Levels[1]

Receptor	Exterior Noise Level (Ldn) (dBA CNEL)	Noise/Land Use Compatibility
Multifamily Residential	65-70	Normally Unacceptable
Retail	65-70	Normally Acceptable
[1] Source: The City of Ontario General Plan Table LU-7		

The Project may experience noise levels that fall within the normally unacceptable range (65-75 CNEL) for the residential part of the Project and clearly acceptable (65-70 CNEL) for the retail part of the Project. Hence, upgraded building construction techniques are expected to be required to achieve interior noise level standards for the residential uses. Based on the existing noise levels (CNEL) nearest the Project site range from 60.6 CNEL to 62.5 CNEL. It should be noted that the existing noise levels were taken during typical weekday conditions and do not include noise levels during an event at the Toyota Arena event center, which may further increase noise levels (i.e., traffic) in the area. Therefore, in order to be conservative, the higher limit of the future traffic noise levels at the Project site (70 dBA CNEL) has been utilized to conduct preliminary interior noise analysis.

A preliminary interior noise analysis has been prepared for the sensitive receptor locations using a typical "windows open" and "windows closed" condition. A "windows open" condition assumes 12 dBA of noise attenuation from the exterior noise level. A "windows closed" condition" assumes 20 dBA of noise attenuation from the exterior noise level. **Table 3-14**, ***Preliminary Interior Noise Impact Analysis***, indicates the interior noise levels for the residential uses on the Project site.

Table 3-14: Preliminary Interior Noise Impact Analysis

Receptor Location	Exterior Noise Level at Building Façade	Interior Noise Standard	Required Building Shell Noise Reduction	Interior Noise Level with Standard California Construction Windows (STC > 25)		STC Rating for Windows Facing Subject Roadway
				"Windows Open"1	"Windows Closed"2	
Multifamily Residential	70	45.0	25	58	50	28
Source: RK Engineering. Noise Analysis. *Table 16, Preliminary Interior Noise Impact Analysis.* [1] A minimum of 12 dBA noise reduction is assumed with the "windows open" condition. [2] A minimum of 20 dBA noise reduction is assumed with the "windows closed" condition.						

The Project is expected to require a "windows closed" condition and upgraded STC rated windows to meet the City/State interior noise standard of 45 dBA. To accommodate a “windows closed” conditions, all units shall be equipped with adequate fresh air ventilation, per the requirements of the California Uniform Building Code (UBC). Prior to issuance of building permits, the Project proponent should demonstrate to the City building department that the proposed building shell and window assemblies would achieve exterior to interior noise reduction necessary to meet the State of California and City of Ontario requirements. Furthermore, the Project shall comply with California Title 24 insulation building requirements for multi-family dwelling units for common separating assemblies (e.g., floor/ceiling assemblies and demising walls).

Los Angeles Ontario International Airport (LAONT)

The Los Angeles Ontario International Airport (LAONT) is centrally located in the City of Ontario. The airport is a medium-hub, full-service airport. Traffic at the airport includes general aviation, commercial passenger aviation, and air cargo freight movement. LAONT is a member of the Los Angeles World Airport (LAWA) system. LAWA is currently developing a Master Land Use Plan for LAONT that will provide a framework for the airport’s development and use through the year 2030.

The LAONT is located approximately 1.25 miles to the southwest of the Project site. A noise/land use compatibility assessment has been performed based on the Project’s location to the LAONT Airport. The noise contour maps for the LAONT Airport are provided in Exhibit D of the Noise Impact Study, provided as Appendix C of this Addendum. The Project is located outside of the 60 dB Ldn noise contour limit; therefore, the exterior noise impact from the airport would be within the allowable limits for residential land uses and the Project is considered compatible with the surrounding land use and noise environment. Noise from airport operations is expected to generate a *less than significant* on the proposed Project.

Design Features

The following recommended Project design features include standard rules and requirements, best practices and recognized design guidelines for reducing noise levels.

Design features are assumed to be part of the conditions of the proposed Project and integrated into its design. Design features are *not* typically considered mitigations under CEQA.

Operational Design Features

NOI-DF-1 Prior to the issuance of building permits, the Project shall prepare a final acoustical study that demonstrates building construction will achieve the minimum interior noise standard of 45 dBA CNEL for all residential units located along arterial roadways and/or adjacent to industrial uses, per the California Building Standards Code. The following noise control measures may be required for dwelling units located near adjacent roadways and industrial uses:

- Install sound barriers between residences and noise sources.
- Install double-paned or similar sound rated windows.
- Provide sound insulating exterior walls and roofing systems.

- Locate and/or design attic vents to minimize sound propagation into each home.
- Place dwelling as far as practical from the noise source.

NOI-DF-2 The Project shall comply with California Title 24 building insulation requirements for exterior walls, roofs and common separating assemblies (e.g., floor/ceiling assemblies and demising walls).

NOI-DF-3 For proper acoustical performance, all exterior windows, doors, and sliding glass doors should have a positive seal and leaks/cracks must be kept to a minimum.

NOI-DF-4 The final building plans shall ensure that HVAC units are not located within an area of the project site that would contribute to a noise level exceedance at any adjacent property line, per the City of Ontario Municipal Code requirements. To meet the City's noise standards the following measures should be followed:

- All HVAC equipment shall be shielded or enclosed from the line of sight of adjacent residential uses.

Construction Design Features

NOI-DF-5 Prepare a construction management plan and obtain a construction work permit from the City of Ontario prior to starting construction. The construction management plan shall ensure all contractors implement construction best management practices to reduce construction noise levels. Best management practices shall include the following:

- All construction equipment shall be equipped with mufflers and other suitable noise attenuation devices (e.g., engine shields).
- Grading and construction contractors shall use quieter equipment as opposed to noisier equipment (such as rubber-tired equipment rather than track equipment), to the maximum extent feasible.
- If feasible, electric hook-ups shall be provided to avoid the use of generators. If electric service is determined to be infeasible for the site, only whisper-quiet generators shall be used (i.e., inverter generators capable of providing variable load).
- Use electric air compressors and similar power tools rather than diesel equipment, where feasible.
- Locate staging area, generators and stationary construction equipment as far from the adjacent residential homes as feasible.
- Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than five minutes.
- Provide notifications and signage in readily visible locations along the perimeter of construction sites that indicate the dates and duration of construction activities, as well as provide a telephone number where neighbors can inquire about the construction process and register complaints to a designated construction noise disturbance coordinator.

- Construction activities shall not take place between the hours of 6:00 p.m. and 7:00 a.m. on weekdays and Saturday or Sunday between the hours of 6:00 p.m and 9:00 a.m.

NOI-DF-6 No impact pile driving or blasting activities shall be permitted on the Project site during construction. If impact pile driving or blasting is required, a follow-up noise and vibration impact assessment shall be conducted prior to start of any activity.

3.5.9 Aesthetics

The proposed Project reflects development and design standards envisioned under the OCSP. (Please refer to the SPA document for a comprehensive listing of proposed design standards.) Prior to issuance of building permits, the City would review Project facilities' designs for consistency with the OCSP. On this basis, the Project would not result in new, additional, or different impacts than were considered and addressed in the Certified EIR. No changes or additions to the Certified EIR analysis are necessary.

3.5.10 Seismicity

In terms of seismicity, the Certified EIR indicates that although active earthquake faults are known to exist within the general Project vicinity, no known faults traverse the site. The uses proposed by the Project would result in localized increased exposure of persons and structures to potential seismic hazards. However, the risk at the Project site is considered no greater than that experienced throughout other areas of southern California.

Application of the latest applicable established uniform building code (UBC) seismic design, engineering, and construction standards would ensure that, short of a catastrophic event, Project structures and infrastructure systems would withstand anticipated seismic activity. As such, the Project would not result in new, additional, or different impacts than were considered and addressed in the Certified EIR. No changes or additions to the Certified EIR analysis are necessary.

3.5.11 Hydrology

The Certified EIR indicates that extensive regional drainage improvements had been constructed since the original approval of the OCSP. These improvements included the Day Creek Channel, Deer Creek Channel, Turner Basins, and the Fourth Street Interceptor. The Certified EIR stated that, "with the exception of Day Creek, all downstream drainage systems have been upgraded to accept the predicted fully developed runoff from The Ontario Center. Day Creek improvements were funded and scheduled to be constructed in the near future, as of the approval of the Certified EIR, which would have updated the mainline systems below The Ontario Center."

The Project developer was required to install new storm drainage facilities pursuant to adopted drainage plans if necessary, and, if modifying existing drainage facilities, must have ensured that no facility was removed without replacement by another functionally equivalent facility. Easements are required for drainage facilities placed outside of public streets. As required under adopted BMPs, temporary siltation basins and/or similar facilities would be implemented as a means of reducing siltation during construction activities.

Application of the above-noted and similar measures as required by the City and RWQCB, would ensure that storm drainage flows do not adversely affect land uses on-site, or "downstream" properties or watercourses, either through potential flooding, erosion, or water quality impacts.

Additionally, the Certified EIR addressed groundwater recharge, stating, "The proposed development will not significantly change groundwater recharge conditions. Recharge is currently limited on the site due to runoff rates and soil conditions. Overland flows across the pervious sections of the site are not expected to infiltrate to a depth where an effect on groundwater storage is significant." The Project does not propose elements or aspects that would materially affect these conclusions.

On the basis of the preceding discussions, the Project would not result in new, additional, or different hydrology impacts than were considered and addressed in the Certified EIR. No changes or additions to the Certified EIR analysis are necessary.

3.5.12 Water Quality

The Certified EIR addresses the potential for impacts to regional groundwater resulting from urbanization of the OCSP site. As noted previously, adopted BMPs require provision of temporary structural measures, (such as velocity dissipators, siltation fences or basins, and vegetative buffer zones), along with periodic cleaning of storm drains and street sweeping, thereby reducing siltation and sedimentation runoff during construction. Further, the Project would implement all long-term and operational requirements of the RWQCB, including those that may have been developed subsequent to adoption of the OCSP and Certification of the EIR. On this basis, the proposed Project would not result in new, additional, or different impacts than were considered and addressed in the Certified EIR. No changes or additions to the Certified EIR analysis are necessary.

3.5.13 Alternatives

The proposed Project is consistent with the development concepts and land uses for the Project site as presented within the Certified EIR and would result in overall reduced development intensities when compared to the maximum allowable development intensities considered in the Certified EIR.

On this basis, potential impacts of the proposed Project would constitute a "Reduced Intensity Alternative," and would be considered within the scope and range of impacts that would result from the Alternatives considered in the Certified EIR. As such, implementation of the proposed Project would have no discernible effect on analyses or conclusions regarding development alternatives considered in the Certified EIR. No changes or additions to the Certified EIR analysis are necessary.

3.5.14 Cumulative Impacts

As demonstrated in the preceding discussions, the proposed Project would result in comparable impacts, but in no case would exceed the scope or intensity of environmental impacts considered and addressed in the Certified EIR, the CECA, POCA, or POOC. Similarly, potential cumulative impacts of the Project would be comparable to, but no greater in scope or intensity than, cumulative impacts as presented in the Certified EIR. On this basis, the Project would have no discernible effect on analyses or conclusions

regarding cumulative impacts considered in the Certified EIR. No changes or additions to the Certified EIR analysis are necessary.

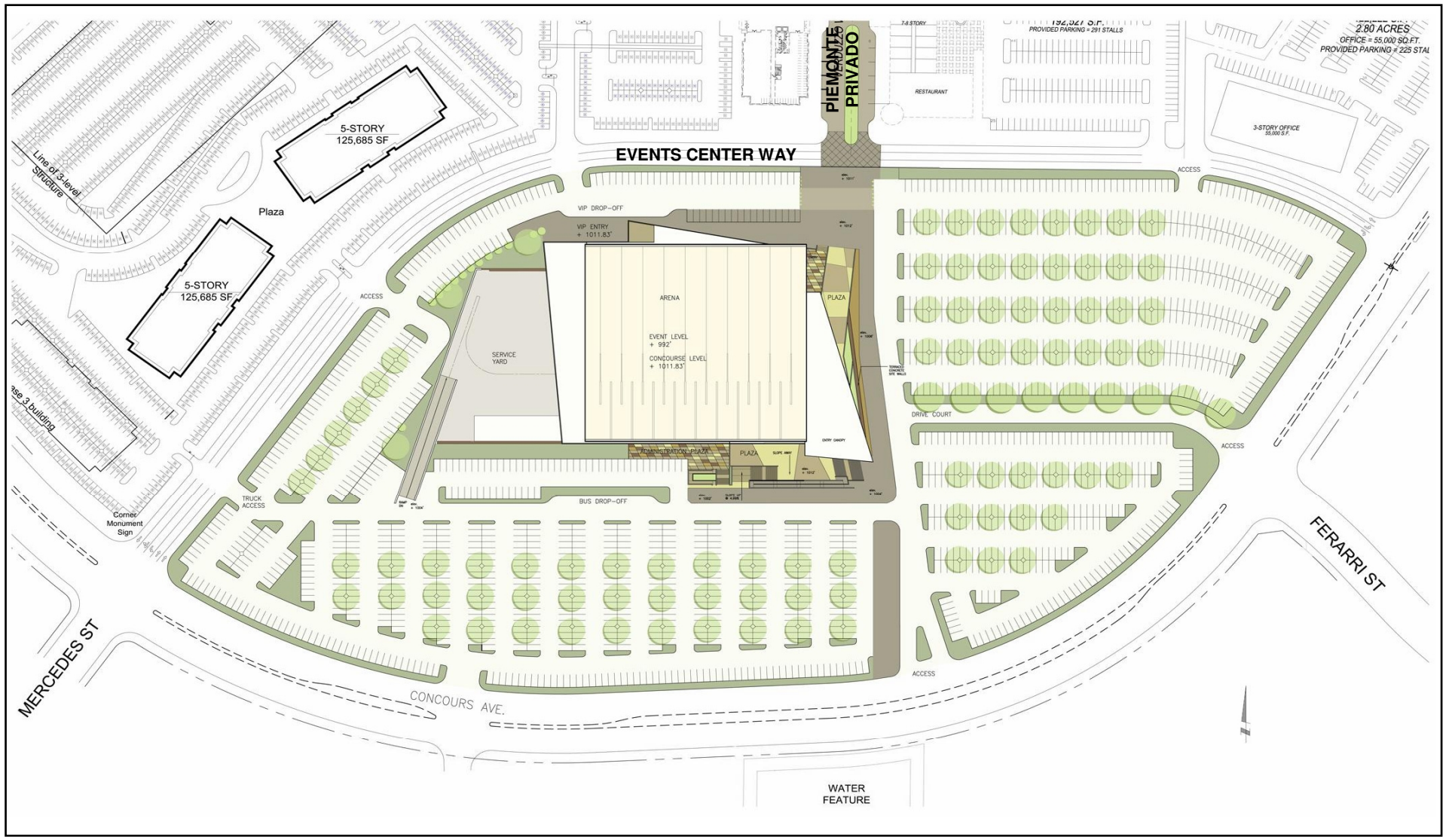


Figure 8: Community Events Center Addendum (CECA) - 2006

Adept-Piemonte Overlay Project Addendum EIR

City of Ontario

Not to Scale

Kimley»Horn

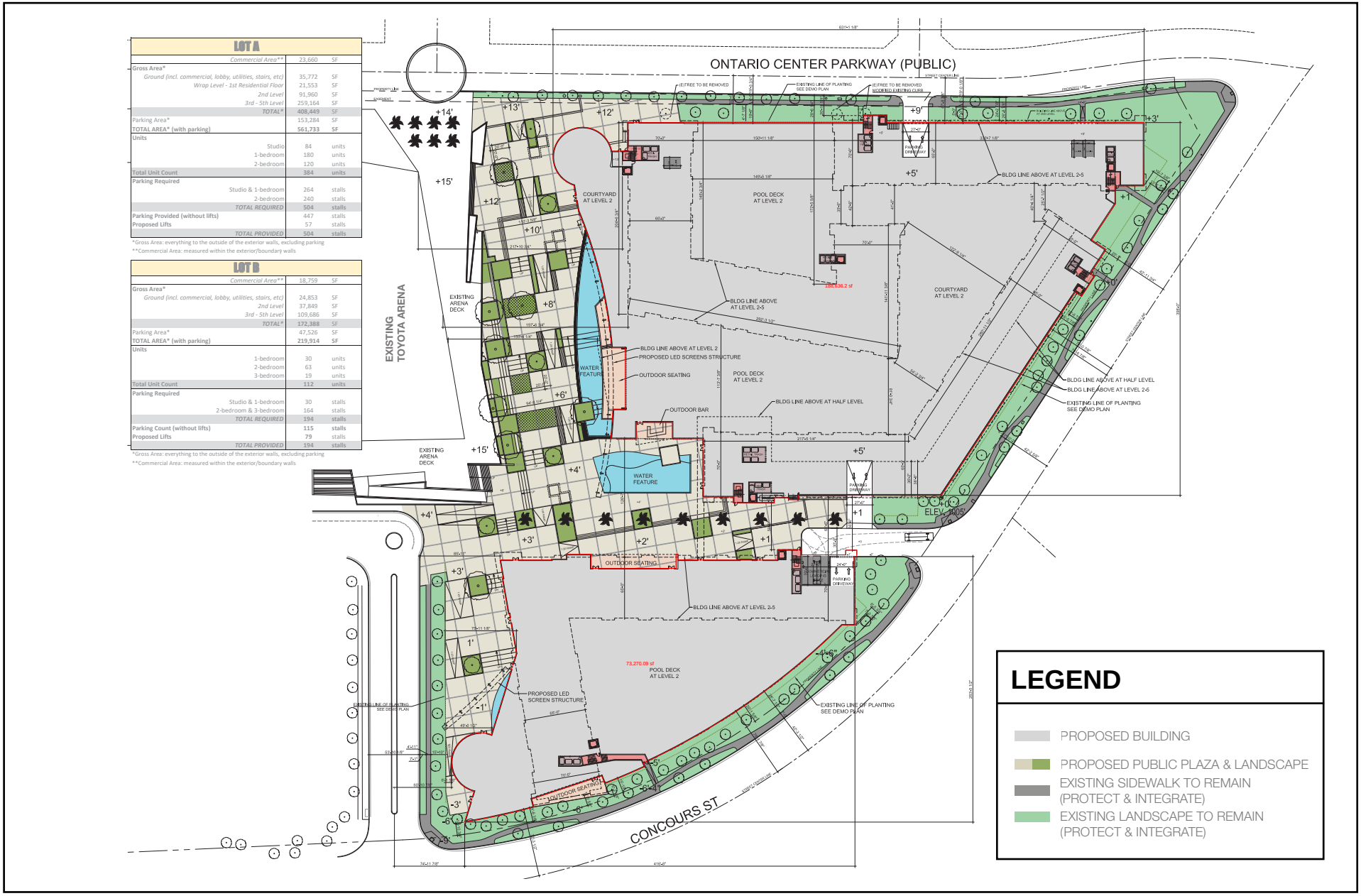


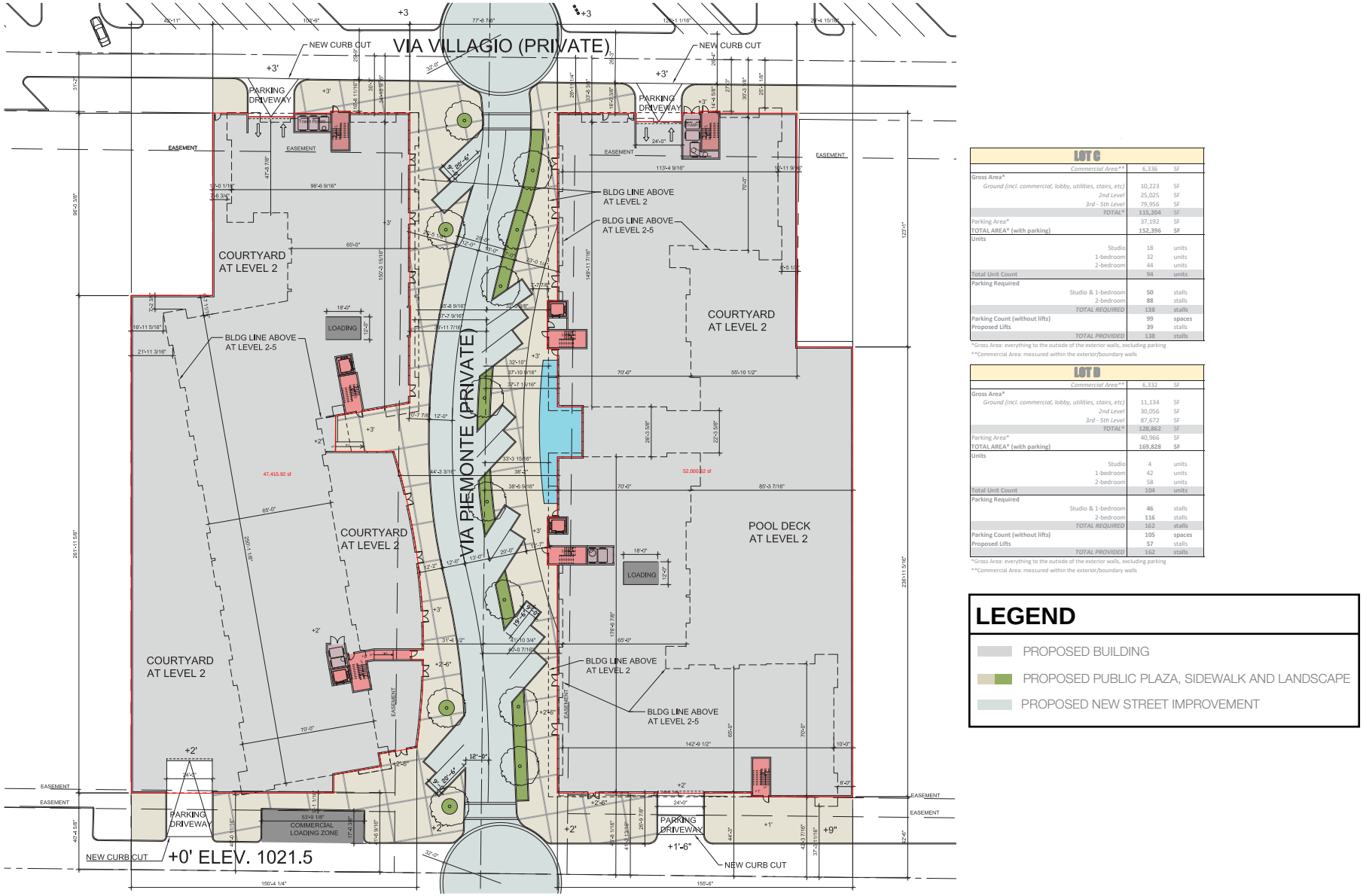
Figure 9: Site Plan (Lots A and B)

Adept-Piemonte Overlay Project Addendum EIR

City of Ontario

Not to Scale

Kimley»Horn



LOT C		
*Commercial Area***	6,336	SF
Gross Area*		
Ground (incl. commercial, lobby, utilities, stairs, etc)	10,223	SF
2nd Level	25,025	SF
3rd - 5th Level	79,956	SF
*TOTAL**	115,204	SF
Parking Area*	37,192	SF
TOTAL AREA* (with parking)	152,396	SF
Units		
Studio	18	units
1-bedroom	32	units
2-bedroom	44	units
Total Unit Count	94	units
Parking Required		
Studio & 1-bedroom	50	stalls
2-bedroom	88	stalls
TOTAL REQUIRED	138	stalls
Parking Count (without lifts)	99	spaces
Proposed Lifts	39	stalls
TOTAL PROVIDED	138	stalls

*Gross Area: everything to the outside of the exterior walls, excluding parking
**Commercial Area: measured within the exterior/boundary walls

LOT D		
*Commercial Area***	6,332	SF
Gross Area*		
Ground (incl. commercial, lobby, utilities, stairs, etc)	11,134	SF
2nd Level	30,056	SF
3rd - 5th Level	87,672	SF
*TOTAL**	128,862	SF
Parking Area*	40,966	SF
TOTAL AREA* (with parking)	169,828	SF
Units		
Studio	4	units
1-bedroom	42	units
2-bedroom	58	units
Total Unit Count	104	units
Parking Required		
Studio & 1-bedroom	46	stalls
2-bedroom	116	stalls
TOTAL REQUIRED	162	stalls
Parking Count (without lifts)	105	spaces
Proposed Lifts	57	stalls
TOTAL PROVIDED	162	stalls

*Gross Area: everything to the outside of the exterior walls, excluding parking
**Commercial Area: measured within the exterior/boundary walls

LEGEND

- PROPOSED BUILDING
- PROPOSED PUBLIC PLAZA, SIDEWALK AND LANDSCAPE
- PROPOSED NEW STREET IMPROVEMENT

Figure 10: Site Plan (Lots C and D)

Adept-Piemonte Overlay Project Addendum EIR

City of Ontario

Not to Scale

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Not to Scale

Figure 11: Piemonte at Ontario Center Addendum (POCA) - 2006

Adept-Piemonte Overlay Project Addendum EIR

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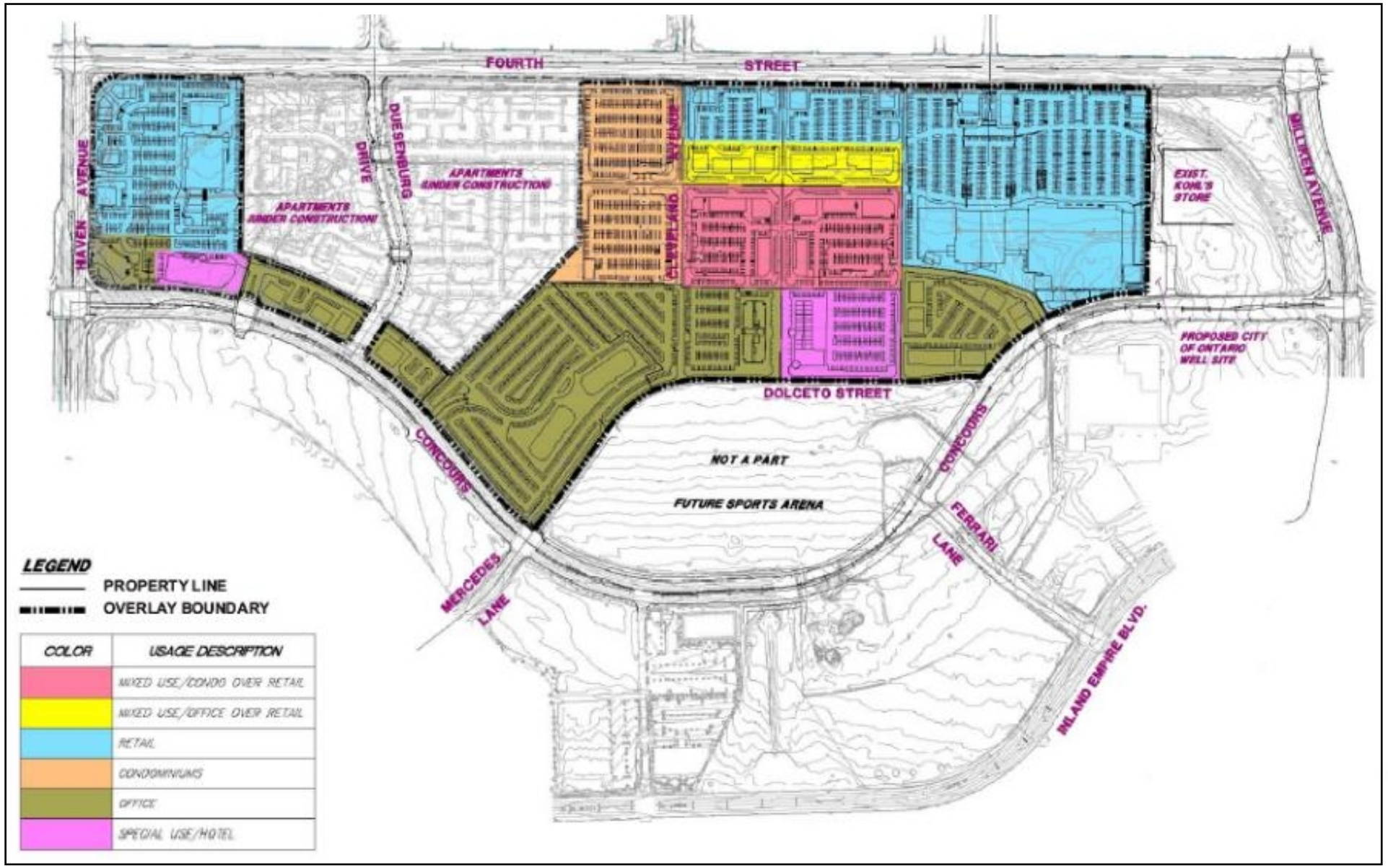

Figure 12: Piemonte Overlay at Ontario Center (POOC) - 2017

Adept-Piemonte Overlay Project Addendum EIR

City of Ontario

Not to Scale

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Figure 13: Elevations (Lots A and B)

Adept-Piemonte Overlay Project Addendum EIR

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Figure 14: Elevations (Lots C and D)

Adept-Piemonte Overlay Project Addendum EIR

City of Ontario

4.0 Determination

4.0 DETERMINATION

As supported by the analysis presented in this Addendum, the potential environmental effects of the Adept-Piemonte Overlay Project at the Ontario Center Specific Plan, and associated required discretionary actions, have been adequately addressed in the Certified EIR for the OCSP (EIR 88-2, SCH No. 89041009). Additionally, this Addendum to the Certified EIR provides minor changes to the Certified EIR analysis which reflect certain facilities configurations and development standards presented in the CECA, POCA, and POOC. As such, preparation of any further information and analysis (e.g., preparation of a Subsequent or Supplemental EIR) is not warranted.

Pursuant to the requirements of CEQA Section 15162 and 15164, the following determinations have been made:

Major EIR Revisions Not Required

Based on the preceding analysis and information, there is no evidence that major changes to the Certified EIR are required. Comparison of the previous project with the Project described in this Addendum indicates that there is no new significant or more severe environmental impact, and that the approval of the Project described herein would have the same or reduced impacts as those described in the Certified EIR prepared for the OCSP.

No Substantial Change in Circumstances Requiring Major EIR Revisions

There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances that would require major changes to the Certified EIR.

No New Information Showing Greater Significant Effects than Identified in the EIR

This Addendum has considered all available relevant information to determine whether there is new information, that was not available at the time the OCSP EIR was certified, that may indicate that a new significant effect may occur that was not reported in the Certified EIR. As supported by the analysis presented in this Addendum, there is no substantial new information, that was not available at the time the OCSP was certified, indicating that there will be a new, significant impact requiring major revisions of the EIR.

No New Information Showing Ability to Reduce Significant Effects Identified in the EIR

The Addendum analysis substantiates that there are no significant impacts requiring identification of new or additional alternatives to the Project, or consideration of new or additional mitigation measures, in order to reduce one or more of the significant effects identified in the EIR.

APPENDIX A
TRAFFIC IMPACT ANALYSIS

APPENDIX B
AIR QUALITY AND GREENHOUSE GAS IMPACT STUDY

APPENDIX C
NOISE IMPACT STUDY

APPENDIX D
ENERGY STUDY

APPENDIX E
OTHER CEQA TOPICS/ENVIRONMENTAL ANALYSIS CHECKLIST

UPDATES TO THE CEQA GUIDELINES

The State of California adopted revisions to the CEQA Guidelines which became effective on January 1, 2019. Pursuant to CEQA Guidelines Sections 15007(d), the City of Ontario must comply with the new Guidelines 120 days after they become effective, which in this case is May 1, 2019. City staff have provided the following supplemental discussion of CEQA Guidelines Appendix G topics where appropriate. Additionally, this section includes a discussion of the CEQA Environmental Checklist.

ENVIRONMENTAL ANALYSIS CHECKLIST

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
1. AESTHETICS. Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒
2. AGRICULTURE AND FOREST RESOURCES. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
3. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☒	☐	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒
4. BIOLOGICAL RESOURCES. Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
5. CULTURAL RESOURCES. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☐	☐	☒
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒
6. GEOLOGY AND SOILS. Would the project:				
a) Result in potentially significant environmental impact due to the wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation:	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficient:	☐	☐	☒	☐
7. GEOLOGY AND SOILS. Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii. Strong seismic ground shaking?	☐	☐	☐	☒
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv. Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18 1 B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
8. GREENHOUSE GAS EMISSIONS. Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emission of greenhouse gases?	☐	☐	☒	☐
9. HAZARDS AND HAZARDOUS MATERIALS. Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within the safety zone of the airport land use compatibility plan for ONT or Chino Airports, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒
10. HYDROLOGY AND WATER QUALITY. Would the project:				
a) Violate any other water quality standards or waste discharge requirements or potential for discharge of storm water pollutants from areas of material storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas or loading docks, or other outdoor work areas?	☐	☒	☐	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site or volume of storm water runoff to cause environmental harm or potential for significant increase in erosion of the project site or surrounding areas?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site or potential for significant changes in the flow velocity or volume of storm water runoff to cause environmental harm?	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff during construction and/or post- construction activity?	☐	☐	☐	☒
f) Otherwise substantially degrade water quality or potential for discharge of storm water to affect the beneficial uses of receiving water?	☐	☒	☐	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Expose people or structures to inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒
11. LAND USE AND PLANNING. Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, airport land use compatibility plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒
12. MINERAL RESOURCES. Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally- important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
13. NOISE. Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within the noise impact zones of the airport land use compatibility plan for ONT and Chino Airports, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
14. POPULATION AND HOUSING. Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of road or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
15. PUBLIC SERVICES. Would the project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
i. Fire protection?	☐	☒	☐	☐
ii. Police protection?	☐	☒	☐	☐
iii. Schools?	☐	☒	☐	☐
iv. Parks?	☐	☒	☐	☐
v. Other public facilities?	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
16. RECREATION. Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which have an adverse physical effect on the environment?	☐	☐	☐	☒
17. TRANSPORTATION/TRAFFIC. Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b) Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
18. TRIBAL CULTURAL RESOURCES. Would the project:				
a) Cause a substantial adverse change in the significance of a Tribal Cultural Resource as defined in Public Resources Code Section 21074?	☐	☐	☐	☒
19. UTILITIES AND SERVICE SYSTEMS. Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed? In making this determination, the City shall consider whether the project is	☐	☒	☐	☐

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
subject to the water supply assessment requirements of Water Code Section 10910, et seq. (SB 610), and the requirements of Government Code Section 664737 (SB 221).				
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☒	☐	☐
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☒	☐	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒
20. WILDFIRE. Would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d) Expose people or structures to significant risks, including downslope, or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒
21. MANDATORY FINDINGS OF SIGNIFICANCE.				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals?	☐	☐	☐	☒
c) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current project, and the effects of probable future projects.)	☐	☐	☒	☐
d) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

EXPLANATION OF THRESHOLDS

1. AESTHETICS

Would the project:

a) Have a substantial adverse effect on a scenic vista?

Discussion of Effects: The Policy Plan (General Plan) does not identify scenic vistas within the City. However, the Policy Plan (Policy CD1-5) requires all major north-south streets to be designed and redeveloped to feature views of the San Gabriel Mountains located to the east. The Project site is located south of Fourth Street, north of Concours Street, between Haven Avenue and Milliken Avenue, and less than one-quarter mile north of Interstate 10 (I-10); refer to Figure 1. The Project site is not located in a major north-south arterial street as identified in the Functional Roadway Classification Plan (Figure M-2) of the Mobility Element within the General Plan.

Additionally, implementation of the proposed Project would result in development of commercial/retail and residential uses that are similar in scale, character, and intensity to those envisioned under the adopted OCSP and assessed in the Certified EIR. On this basis, the Project is not anticipated to result in different or greater aesthetic impacts than those identified in the Certified EIR. Therefore, no adverse impacts are anticipated in relation to the Project.

Mitigation: None required.

b) Substantially damage scenic resources, including, but not limited to, tress, rock outcroppings and historic buildings within a state scenic highway?

Discussion of Effects: The City of Ontario is served by three freeways: I-10, I-15, and SR-60. I-10 and SR-60 traverse the northern and central portion of the City, respectively, in an east–west direction. I-15 traverses the northeastern portion of the City in a north–south direction. These segments of I-10, I-15, and SR-60 have not been officially designated as scenic highways by the California Department of Transportation. In addition, there are no historic buildings, or any scenic resources identified on or in the vicinity of the Project site. Therefore, it would not result in adverse environmental impacts.

Mitigation: None required.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

Discussion of Effects: The proposed Project would not degrade the existing visual character or quality of the site or its surroundings. The Project site is located in an area that is characterized by a mix of commercial, entertainment retail, office, and high-density residential land uses, and is surrounded by commercial and office land uses.

The proposed Project would substantially improve the visual quality of the area through development of the site with a mix of commercial, entertainment retail, office, and high-density residential land uses, which would be consistent with the policies of the Community Design Element of the Policy Plan (General Plan) and zoning designations on the property, as well as with the commercial and office development in the surrounding area. Therefore, no adverse impacts are anticipated.

Mitigation: None required.

d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

Discussion of Effects: New lighting would be introduced to the site with the development of the proposed Project. Pursuant to the requirements of the City's Development Code, Project on-site lighting would be shielded, diffused or indirect, to avoid glare to pedestrians or motorists. In addition, lighting fixtures would be selected and located to confine the area of illumination to within the Project site and minimize light spillage.

Site lighting plans would be subject to review by the Planning Department and Police Department prior to issuance of building permits (pursuant to the City's Building Security Ordinance). Therefore, no adverse impacts are anticipated.

Mitigation: None required.

2. AGRICULTURE AND FOREST RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

Discussion of Effects: The site is presently vacant and does not contain any agricultural uses. Further, the site is identified as "Other Land" and "Urban and Built-Up Land" on the map prepared by the California Resources Agency, pursuant to the Farmland Mapping and Monitoring Program. The "Other Land" consists of vacant and nonagricultural land that is greater than 40 acres in area and is surrounded on all sides by urban development. As a result, no adverse environmental impacts are anticipated.

Mitigation: None required.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

Discussion of Effects: The Project site is not zoned for agricultural use. The project site is zoned SP (Specific Plan) and is located within the Urban Commercial land use district and the Piemonte Overlay district of the OCSP, which is intended for development with a mix of commercial, entertainment retail, office, and high density residential land uses. The proposed Project is consistent with the development standards and allowed land uses of the proposed land use district. Furthermore, there is no Williamson Act contract in effect on the subject site. Therefore, no impacts to agricultural uses are anticipated, nor would there be any conflict with existing or Williamson Act contracts.

Mitigation: None required.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)?

Discussion of Effects: The proposed Project is intended for development with a mix of commercial, entertainment retail, office, and high-density residential land uses. The proposed Project is consistent with the Land Use Element (Figure LU-6) of the Policy Plan (General Plan) and the development standards and allowed land uses of the Urban Commercial land use district and the Piemonte Overlay district of the OCSP. Therefore, no adverse impacts are anticipated.

Mitigation: None required.

d) Result in the loss of forest land or conversion of forest land to non-forest use?

Discussion of Effects: There is currently no land in the City of Ontario that qualifies as forest land as defined in Public Resources Code section 12220(g). Neither The Ontario Plan nor the City's Zoning Code provide designations for forest land. Consequently, the proposed Project would not result in the loss or conversion of forest land.

Mitigation: None required.

e) Involve other changes in the existing environment, which, due to their location or nature, could individually or cumulatively result in loss of Farmland to non-agricultural use or conversion of forest land to non-forest use?

Discussion of Effects: The proposed Project site is not designated as Farmland is currently zoned Specific Plan, and is located within the Urban Commercial land use district and the Piemonte Overlay district of the OCSP, which is intended for development with a mix of commercial, entertainment retail, office, and high-density residential land uses. The proposed Project site is currently partly vacant, but previously graded, on the northern portion of the site and fully developed with parking areas currently utilized for the Toyota Arena. There are no agricultural uses occurring onsite. As a result, to the extent that the Project would result in changes to the existing environment those changes would not result in loss of Farmland to non-agricultural use.

Additionally, there is currently no land in the City of Ontario that qualifies as forest land as defined in Public Resources Code Section 12220(g). Neither The Ontario Plan nor the City's Zoning Code provide designations for forest land. Consequently, to the extent that the proposed Project would result in changes to the existing environment, those changes would not impact forest land.

Mitigation Required: None required.

3. AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

a) Conflict with or obstruct implementation of the applicable air quality plan?

Discussion of Effects: The Project would not conflict with or obstruct implementation of any air quality plan. As noted in The Ontario Plan FEIR (Section 5.3), pollutant levels in the Ontario area already exceed Federal and State standards. To reduce pollutant levels, the City of Ontario is actively participating in

efforts to enhance air quality by implementing Control Measures in the Air Quality Management Plan for local jurisdictions within the South Coast Air Basin.

The proposed Project is consistent with The Ontario Plan, for which the EIR was prepared and impacts evaluated. Furthermore, the Project is consistent with the City's participation in the Air Quality Management Plan (AQMP).

Additionally, implementation of the Project would result in the construction of commercial/retail and residential uses in a much lower scope and character to those assessed in the Certified EIR. As such, construction-related air pollutant emissions would be lower to than those considered in the Certified EIR. Further, shown in Table 3-7, the proposed Project would not exceed any construction emission thresholds. Additionally, as discussed in the Addendum, a reduction in total average daily traffic generation is anticipated under the Project. As a result, reductions in vehicle pollutant emissions are anticipated. Based on the preceding discussion, the proposed Project would not result in different or greater air quality impacts than those identified in the Certified EIR. Please refer also to Addendum Section 3.5.3, “Air Quality.” A less than significant impact would occur.

Mitigation: None required.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Discussion of Effects: Short term air quality impacts will result from construction related activities associated with construction activity, such as excavation and grading, machinery and equipment emissions, vehicle emissions from construction employees, etc. The daily emissions of nitrogen oxides and particulates from resulting grading and vehicular emissions may exceed threshold levels of the South SCAQMD.

The Project must follow mandatory SCAQMD rules and requirements with regards to fugitive dust control, as described in Section 6.1.3 of the SCAQMD rules. Compliance with the standard dust control measures is considered to be part of the conditions of approval for the Project and built into the design features. Table 3-7, shows that, the Project’s daily construction emissions would be below the applicable SCAQMD air quality standards and thresholds of significance. As a result, the Project would not contribute substantially to an existing or projected air quality violation. As noted in Table 1-1, the Certified EIR include a set of mitigation measures that are applicable to the proposed Project.

Mitigation: Air Quality

MM-AQ-1 Regular watering, paving construction roads, or other dust control measures defined in SCAQMD Rule 403 will occur during construction.

MM-AQ-2 Construction equipment will be maintained in proper tune to minimize the volume of equipment exhaust emissions.

MM-AQ-3 Comprehensive ridesharing incentive program will be developed as part of a Transportation System Management.

MM-AQ-4 Orientation of Project for transit convenience and accessibility will occur in design phase; provision of easy pedestrian access will occur in design phase; provision of bus shelters, benches and bus pockets on streets.

MM-AQ-5 Provision of traffic flow improvements will occur as buildout of project occurs.

MM-AQ-6 Inclusion of solar and other energy-saving devices in residences and businesses including:

- delamping
- increased building insulation
- heating/ventilation/air conditioning improvements
- solar heaters
- utilization of landscape features to shade buildings

MM-AQ-7 Construction activities should avoid high ozone days and discontinue construction during second stage alerts. After grading, seed and water until vegetation cover is established.

MM-AQ-8 Wet area down, sufficient enough to form a crust on the surface with repeated soakings, as necessary, to maintain the crust and prevent dust pickup by the wind.

MM-AQ-9 Use water trucks or sprinkler systems to keep all areas where vehicles move damp enough to prevent dust from being raised beyond site operations. Wet construction areas down in the late morning and after work is completed in the day.

MM-AQ-10 Use low sulfur fuel for construction equipment (0.5 percent by weight).

As noted in the Certified EIR, a less than significant impact will occur with implementation of the applicable mitigation measures.

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?

Discussion of Effects: The Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the region is in non-attainment under an applicable federal or state ambient air quality because of the limited size and scope of the project. Although no impacts are anticipated, the Project would still comply with the air quality standards of the TOP FEIR and the SCAQMD resulting in impacts that are less than significant [please refer also to Addendum Section 3.5.3, “Air Quality.”] A less than significant impact would occur.

Mitigation: None required.

d) Expose sensitive receptors to substantial pollutant concentrations?

Discussion of Effects: Sensitive receptors are defined as populations that are more susceptible to the effects of pollution than the population at large. The SCAQMD identifies the following as sensitive receptors: long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, childcare centers, and athletic facilities. According to the SCAQMD, projects have the potential to create significant impacts if they are located within one-quarter mile of sensitive receptors and would emit toxic air contaminants identified in SCAQMD Rule 1401.

Given the close proximity of the project to nearest sensitive receptors (residential homes to the north), several measures are provided to help ensure the potential health risk associated with Diesel Particulate Matter (DPM) during construction is reduced to the maximum extent feasible. This includes a requirement for Tier 4 engines on all diesel-powered construction equipment. Tier 4 engines, along with the latest

national fuel standards, have been shown to yield PM reductions of over 95 percent from the typical Tier 2 and Tier 3 engines[8].

It is presumed that with the recommended design features and Tier 4 engines in place that the potential short term construction health risks would be adequately reduced to be less than significant. Design features DF-3 through DF-9 are recommended to help ensure the Project does not expose receptors to substantial pollution concentrations during construction. However, these are not considered mitigation measures. A less than significant impact would occur.

Mitigation: None required.

e) Create objectionable odors affecting a substantial number of people?

Discussion of Effects: The uses proposed on the subject site, as well as those permitted within the Urban Commercial land use district and the OCSP, do not create objectionable odors. Further, the Project shall comply with the policies of the Ontario Municipal Code and the General Plan. Additionally, as noted in the Air Quality and Greenhouse Gas Analysis, the Project's operations would result in less than significant odor impacts. Therefore, no adverse impacts are anticipated.

4. BIOLOGICAL RESOURCES

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Discussion of Effects: The site is located within an area that has historically been found to contain Delhi Soils, which is potential habitat for the Delhi Sand Flower-loving Fly (DSF), a federally listed endangered species. However, as a result of previous development, grading, and land uses on the Project site, including construction and operation of the Ontario Motor Speedway (razed in 1981), and more recently, construction activity associated with the phased development of approximately 1.3 million square feet of retail, office, hotel, and entertainment uses, and 800 multiple-family dwelling units, including mass grading of the entire Project area, the installation of public utilities, and the construction of street improvements, have left the Project site in an extremely disturbed state. This determination is supported by previous environmental reports addressing the Project site, including Ontario International Centre EIR 80-3 (SCH No. 80062538), Certified EIR 88-2 (SCH No. 89041009), and the POCA, all of which have found the Project site to be in an extremely disturbed state, with no native soils or native vegetation on the site. The Project site has not been designated as a planned recovery zone for the DSF, and in its current condition, does not provide suitable habitat. No impact would occur.

Mitigation: None required.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife, or U.S. Fish and Wildlife Service?

[8] EPA. Control of Emissions of Air Pollution from Nonroad Diesel Engines and Fuel; Final Rule. (40 CFR Parts 9, 69, et al.)

Discussion of Effects: The Project site does not contain any riparian habitat or other sensitive natural community identified by the California Department of Fish & Wildlife, or U.S. Fish & Wildlife Service. Therefore, no adverse environmental impacts are anticipated.

Mitigation: None required.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Discussion of Effects: No wetland habitat is present on site. Therefore, Project implementation would have no impact on these resources.

Mitigation: None required.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Discussion of Effects: The Project site is a mixed vacant and fully developed property that is bounded on all four sides by development. As a result, there are no wildlife corridors connecting this site to other areas. Therefore, no adverse environmental impacts are anticipated.

Mitigation: None required.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Discussion of Effects: The City of Ontario does not have any ordinances protecting biological resources. Further, the site does not contain any mature trees necessitating the need for preservation. As a result, no adverse environmental impacts are anticipated.

Mitigation: None required.

f) Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or state habitat conservation plan?

Discussion of Effects: The site is not part of an adopted HCP, NCCP or other approved habitat conservation plan. As a result, no adverse environmental impacts are anticipated.

Mitigation: None required.

5. CULTURAL RESOURCES

Would the project:

a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?

Discussion of Effects: The Project site does not contain any buildings, structures, or objects. Additionally, as part of the Project site development during the OCSP, CECA, POCA, POOSCP, the Project site has been previously disturbed and fully graded. Therefore, no adverse impacts are anticipated.

Mitigation: None required.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

Discussion of Effects: The Ontario Plan FEIR (Section 5.5) indicates no archeological sites or resources have been recorded in the City with the Archeological Information Center at San Bernardino. As noted above, because the site has been previously fully disturbed and graded and no historical structures existing on-site, no adverse change in significance or an archaeological resource is anticipated.

Mitigation: None required.

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Discussion of Effects: As described in the Certified EIR, cultural resources were not anticipated to be affected by the OCSP. As previously noted, the Project site has been previously graded. As such, the proposed Project would not affect areas or resources not previously considered in the Certified EIR. No additional or different impacts have been identified based on the Project

Mitigation: None required.

d) Disturb any human remains, including those interred outside of formal cemeteries?

Discussion of Effects: The proposed Project is in an area that has been previously disturbed by development. No known religious or sacred sites exist within the Project area. Thus, human remains are not expected to be encountered during any construction activities. However, in the unlikely event that human remains are discovered, existing regulations, including the California Public Resources Code Section 5097.98, would afford protection for human remains discovered during development activities. Furthermore, standard conditions have been imposed on the Project that in the event of unanticipated discoveries of human remains are identified during excavation, construction activities, the area shall not be disturbed until any required investigation is completed by the County Coroner and/or Native American consultation has been completed, if deemed applicable.

Mitigation: None required.

6. Energy

Would the project:

a) Result in potentially significant environmental impact due to the wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation:

A Project specific Energy Study was prepared by RK Engineering Group, Inc. Findings are summarized herein, and the technical study is available as Appendix D of this Addendum.

Discussion of Effects: As described in the Certified EIR, the Project's impact is considered less than significant with the inclusion of the mandatory requirements of California's Building Energy Efficiency Standards (Title 24, Part 6) and Green Building Standards (CALGreen, Title 24, Part 11). California's building energy efficiency standards are some of the strictest in the nation and the Project's compliance with California's building code would ensure that wasteful, inefficient or unnecessary consumption of energy

is minimized. The building standards code is designed to reduce the amount of energy needed to heat or cool a building and reduce energy usage for lighting and appliances.

The proposed Project is anticipated to have a less than significant impact on energy. The following recommended energy design features (DF) are provided to further reduce wasteful, inefficient and unnecessary consumption of energy. Design features are consistent with the recommended design features provided with Air/GHG study. These DF are not considered mitigation measures.

Construction Energy Design Features

E-DF-1 Establish an electricity supply to the construction site and use electric powered equipment instead of diesel-powered equipment or generators, where feasible.

Operational Design Features

E-DF-2 Implement the GHG Reduction Measures from the Ontario County Climate Action Plan (CAP) Screening Tables to achieve at least 100 points, per the requirements for Mixed Use Projects.

E-DF-3 Comply with the mandatory requirements of California Building Standards Code Title 24 Part 6 (Energy Code) and Title 24 Part 11 (CAL Green).

E-DF-4 Implement water conservation strategies, including low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and limit the amount of turf/sod, per CAL Green and City of Ontario requirements.

E-DF-5 Implement zero waste strategies, recycling and composting programs for residential and non-residential uses.

E-DF-6 Encourage residents and landscape maintenance crews to use electric landscaping equipment, such as lawnmowers and leaf blowers, wherever feasible.

E-DF-7 No natural gas or wood burning fireplaces shall be installed in any residential dwelling.

E-DF-8 Implement trip reduction measures that reduce the number of auto-based trips and encourage the use of transit, bicycling, and walking. Such as;

1. Improve the walkability and design of the project by including pedestrian and bicycling connections within the project site and to adjacent off-site facilities (i.e., sidewalks, crosswalks, foot paths, protected bike lanes, multi-purpose trails, direct parcel-to-parcel connections, wayfinding signage, etc.).
2. Provide traffic calming measures (i.e., marked crosswalks, raised crosswalks, raised intersections, count-down signal timers, curb extensions, speed tables, median islands, tight corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, etc.)
3. Provide bicycle racks for the retail and commercial uses and secure bicycle parking areas for the office and residential uses.

E-DF-9 Provide electric vehicle charging stations per the requirements of CALGreen.

A less than significant impact would occur.

Mitigation: None required.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficient:

Discussion of Effects: The proposed Project's impact is considered less than significant as the Project would purchase electricity through Southern California Edison which is subject to the requirements of California Senate Bill 100 (SB 100). SB 100 is the most stringent and current energy legislation in California; requiring that renewable energy resources and zero-carbon resources supply 100 percent of retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045.1 The Project would further comply with the mandatory requirements of California's Green Building and Building Energy Efficiency standards that promote renewable energy and energy efficiency. A less than significant impact would occur.

Mitigation: None required.

7. GEOLOGY & SOILS

Would the project:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

Discussion of Effects: There are no active faults known on the site and the Project site is located outside the Fault Rapture Hazard Zone (formerly Alquist-Priolo Zone). The Ontario Plan FEIR (Section 5.7/ Figure 5.7-2) identifies eight active or potentially active fault zones near the City. Given that the closest fault zone is located more than ten miles from the Project site, fault rupture within the Project area is not likely. All development would comply with the UBC seismic design standards to reduce geologic hazard susceptibility. Therefore, no adverse impacts are anticipated.

Mitigation: None required.

ii) Strong seismic ground shaking?

Discussion of Effects: There are no active faults known on the site and the Project site is located outside the Fault Rapture Hazard Zone (formerly Alquist-Priolo Zone). The Land Use Plan (Figure LU-6) of the Policy Plan (General Plan) FEIR (Section 5.7/Figure 5.7-2) identifies eight active or potentially active fault zones near the City. The closest fault zone is located more than ten miles from the Project site. The proximity of the site to the active faults would result in ground shaking during moderate to severe seismic events. All construction would be in compliance with the California Building Code (CBC), the Ontario Municipal Code, The Ontario Plan and all other ordinances adopted by the City related to construction and safety. Therefore, no adverse impacts are anticipated.

Mitigation: None required.

iii) Seismic-related ground failure, including liquefaction?

Discussion of Effects: As identified in the TOP FEIR (Section 5.7), groundwater saturation of sediments is required for earthquake induced liquefaction. In general, groundwater depths shallower than 10 feet to the surface can cause the highest liquefaction susceptibility. According to the POOC MND, depth to ground water at the Project site during the winter months is estimated to be between 250 to 450 feet below ground surface. Therefore, the liquefaction potential within the Project area is minimal.

Implementation of The Ontario Plan strategies, UBC and Ontario Municipal Code would reduce impacts to a less than significant level.

Mitigation: None required.

iv) Landslides?

Discussion of Effects: The proposed Project would not expose people or structures to potential adverse effects, including the risk of loss, injury, or death involving landslides because the relatively flat topography of the Project site (less than two percent slope across the City) makes the chance of landslides remote. Implementation of The Ontario Plan strategies, UBC and OMC would reduce impacts to a less than significant level.

Mitigation: None required.

b) Result in substantial soil erosion or the loss of topsoil?

Discussion of Effects: The proposed Project would not result in significant soil erosion or loss of topsoil because of the previously disturbed and developed nature of the Project site and the limited size and scope of the Project. Grading increases the potential for erosion by removing protective vegetation, changing natural drainage patterns, and constructing slopes. However, compliance with the CBC and review of grading plans by the City Engineer would ensure no significant impacts would occur. In addition, the City requires an erosion/dust control plan for projects located within this area. Implementation of a NPDES program, the Environmental Resource Element of the General Plan strategies, UBC, and OMC would reduce impacts to a less than significant level.

Mitigation: None required.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Discussion of Effects: The Project site would not result in the location of development on a geologic unit or soil that is unstable, or that would become unstable because as previously discussed, the potential for liquefaction and landslides associated with the Project site is less than significant. The Ontario Plan FEIR (Section 5.7) indicates that subsidence is generally associated with large decreases or withdrawals of water from the aquifer. The Project would not withdraw water from the existing aquifer. Further, implementation of The Ontario Plan strategies, UBC and OMC would reduce impacts to a less than significant level.

Mitigation: None required.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Discussion of Effects: The majority of Ontario, including the Project site, is located on alluvial soil deposits. These types of soils are not considered to be expansive. Therefore, no adverse impacts are anticipated.

Mitigation: None required.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

Discussion of Effects: The area is served by the local sewer system and the use of alternative systems is not necessary. There would be no impact to the sewage system.

Mitigation: None required.

8. GREENHOUSE GAS EMISSIONS

Would the project:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Discussion of Effects: The impact of buildout of The Ontario Plan on the environment due to the emission of greenhouse gases ("GHGs") was analyzed in the Environmental Impact Report ("EIR") for the Policy Plan (General Plan). According to the EIR, this impact would be significant and unavoidable. (Recirculated Portions of the Ontario Plan Draft Environmental Impact Report, p. 2-118). This EIR was certified by the City on January 27, 2010, at which time a statement of overriding considerations was also adopted for The Ontario Plan's significant and unavoidable impacts, including that concerning the emission of GHGs.

Pursuant to Public Resources Code section 21083.3, this impact need not be analyzed further, because (1) the proposed project would result in an impact that was previously analyzed in The Ontario Plan EIR, which was certified by the City; (2) the proposed project would not result in any greenhouse gas impacts that were not addressed in The Ontario Plan EIR; (3) the proposed project is consistent with The Ontario Plan.

A Project-specific Air Quality and Greenhouse Gas Impact Study was prepared. The results are provided herein, and the technical study is included as Appendix B of this Addendum. For purposes of this Project, the City of Ontario, Ontario County Climate Action Plan (CCAP) establishes the requirements for determining whether a project would have a significant impact to GHG emissions under CEQA.

The CCAP uses Screening Tables, which are setup similar to a checklist, with points allocated to certain elements of the Project to reduce GHG emissions. If a project garners 100 points (by including enough GHG reducing elements), then the project is consistent with CCAP and the impact may be considered less than significant for purposes of CEQA.

The proposed Project is expected to comply with the CCAP by implementing the Screening Table requirements into the Project design. To help ensure the Project adheres to the CCAP requirements, the following GHG Project DFs GHG-DF-10 through GHG-DF-17 are provided:

Design Features

GHG-DF-10 Implement the GHG Reduction Measures from the CCAP Screening Tables to achieve at least 100 points, per the requirements for Mixed Use Projects.

As described in Appendix B of the CCAP, for mixed use projects, both the residential and non-residential screening tables shall be completed. Mixed use Projects that garner at least 100 points will be consistent with the reduction quantities in the City's CAP and are considered less than significant for GHG emissions.

Therefore, with the implementation of the CCAP Screening Tables, the Project is not expected to generate GHG emissions, either directly or indirectly, that would cause a significant impact on the environment.

Also, by complying with the CCAP, the Project will not conflict with an applicable plan, policy or regulation for the purpose of reducing the emissions of greenhouse gases and the impact is considered less than significant.

Furthermore, since the purpose of the City's CCAP is to ensure compliance with the state's climate initiatives for reducing GHG emissions, by complying with the CCAP, the Project will also be in compliant with the broader statewide goals for combating climate change; such as those required in the CARB Scoping Plan and AB 32.

The mixed-use Project is also located within close proximity to high quality transit, located in a low VMT zone, and offers high-density residential development near commercial uses. The Project will include pedestrian friendly and walkable design that will encourage fewer auto-based trips. The following Project design features will be provided to further help reduce GHG emissions:

GHG-DF-11 Comply with the mandatory requirements of California Building Standards Code Title 24 Part 6 (Energy Code) and Title 24 Part 11 (CAL Green).

GHG-DF-12 Implement water conservation strategies, including low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and limit the amount of turf/sod, per CAL Green and City of Ontario requirements.

GHG-DF-13 Implement zero waste strategies, recycling and composting programs for residential and non-residential uses.

GHG-DF-14 Encourage residents and landscape maintenance crews to use electric landscaping equipment, such as lawn mowers and leaf blowers, wherever feasible.

GHG-DF-15 No natural gas or wood burning fireplaces shall be installed in any residential dwelling.

GHG-DF-16 Implement trip reduction measures that reduce the number of auto-based trips and encourage the use of transit, bicycling, and walking. Such as;

1. Improve the walkability and design of the project by including pedestrian and bicycling connections within the project site and to adjacent off-site facilities (i.e., sidewalks, crosswalks, foot paths, protected bike lanes, multi-purpose trails, direct parcel-to-parcel connections, wayfinding signage, etc.).
2. Provide traffic calming measures (i.e., marked crosswalks, raised crosswalks, raised intersections, count-down signal timers, curb extensions, speed tables, median islands, tight corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, etc.)
3. Provide bicycle racks for the retail and commercial uses and secure bicycle parking areas for the office and residential uses.

GHG-DF-17 Provide electric vehicle charging stations per the requirements of CALGreen.

The Project is anticipated to have a less than significant impact. Additionally, with implementation of the Project DF, the Project would continue to have a less than significant impact on GHG.

9. HAZARDS & HAZARDOUS MATERIALS

Would the project:

a) Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?

Discussion of Effects: The Project is not anticipated to involve the transport, use or disposal of hazardous materials during either construction or Project implementation. Typical construction activities involve the use and handling of solvents, paints, and other chemicals. However, none of the proposed uses involve the use or handling of dangerous chemicals that could create a significant hazard to the public or the environment. Additionally, the Project site have been previously graded, and no hazardous materials exist onsite. Therefore, no adverse impacts are anticipated. However, in the unlikely event of an accident, implementation of the strategies included in The Ontario Plan would decrease the potential for health and safety risks from hazardous materials to a less than significant impact.

Mitigation: None required.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Discussion of Effects: The proposed Project does not include the use of hazardous materials or volatile fuels. In addition, there are no known stationary commercial or industrial land uses within close proximity to the subject site, which use/store hazardous materials to the extent that they would pose a significant hazard to visitors/occupants to the subject site, in the event of an upset condition resulting in the release of a hazardous material. No impacts are anticipated.

Mitigation: None required

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school?

Discussion of Effects: The proposed Project does not include the use, emissions or handling of hazardous or acutely hazardous materials, substances or waste. Therefore, no impacts are anticipated.

Mitigation: None required.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Discussion of Effects: The proposed Project site is not listed on the hazardous materials site compiled pursuant to Government Code Section 65962.5. Therefore, the Project would not create a hazard to the public or the environment and no impact is anticipated.

Mitigation: None required.

e) For a project located within the safety zone of the airport land use compatibility plan for ONT or Chino Airports, would the project result in a safety hazard for people residing or working in the project area?

Discussion of Effects: According to Land Use Element (Exhibit LU-06 Airport Environs) of the General Plan, the Project site is located within the airport land use plan. However, the Project would not result in a safety hazard for people working or residing in the Project area because it would not obstruct aircraft maneuvering because of the Project's low elevation and the architectural style of the Project. Additionally, the Land Use Compatibility Guidelines for Noise Impacts (Table LU-08) shows the proposed use as normally accepted in the 65 CNEL. The proposed use would comply with standards for mitigating noise. Therefore, no impacts are anticipated.

Mitigation: None required.

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

Discussion of Effects: The Project site is not located within the vicinity of a private airstrip. Therefore, no impacts are anticipated.

Mitigation: None required.

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Discussion of Effects: The City's Safety Element, as contained within The Ontario Plan, includes policies and procedures to be administered in the event of a disaster. The Ontario Plan seeks interdepartmental and inter-jurisdictional coordination and collaboration to be prepared for, respond to, and recover from everyday and disaster emergencies. In addition, the Project would comply with the requirements of the Ontario Fire Department and all City requirements for fire and other emergency access. Because the Project is required to comply with all applicable City codes, any impacts would be reduced to a less than significant level.

Mitigation: None required.

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Discussion of Effects: The Project site is not located in or near wildlands. Therefore, no impacts are anticipated.

Mitigation: None required.

10. HYDROLOGY & WATER QUALITY

Would the project:

a) Violate any other water quality standards or waste discharge requirements or potential for discharge of storm water pollutants from areas of material storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas or loading docks, or other outdoor work areas?

Discussion of Effects: The Project site is served by City water and sewer service and would not affect water quality standards or waste discharge requirements. Discharge of storm water pollutants from areas of

materials storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing, waste handling, hazardous materials handling or storage, delivery areas or loading docks, or other outdoor work) areas could result in a temporary increase in the amount of suspended solids, trash and debris, oil and grease, organic compounds, pesticides, nutrients, heavy metals and bacteria pathogens in surface flows during a concurrent storm event, thus resulting in surface water quality impacts. The site is required to comply with the statewide National Pollutant Discharge Elimination System (NPDES) General Industrial Activities Stormwater Permit, the San Bernardino County Area-Wide Urban Runoff Permit (MS4 permit) and the City of Ontario's Municipal Code (Title 6, Chapter 6 (Stormwater Drainage System)). In addition to the NPDES, MS4, and other permits listed in this section, this site is required to comply with the latest trash capture requirements from the State and RWQCB. This would reduce any impacts to below a level of significance. However, as part of the Certified EIR, the following Mitigation Measures (MMs) were imposed as part of the development of the OCSP:

Mitigation: Hydrology

MM-HYD-1 On-site drainage plans will be designed, submitted to, and approved by the City of Ontario prior to the issuance of a grading permit.

MM-HYD-2 Proposed storm drainage facilities to be installed as The Ontario Center develops, will be placed in public streets. W here storm drains must be placed in areas other than public streets, a drainage easement will be dedicated as needed.

MM-HYD-3 Some modification will be necessary to existing drainage facilities. No existing facility will be removed without replacement by another structure to serve the particular condition.

MM-HYD-4 As development proceeds, there will be a need for temporary siltation basins to reduce sedimentation from construction activities. These will be located in specific areas of construction and sized in accordance with City of Ontario criteria.

With implementation of the applicable Certified EIR MMs, the Project would have a less than significant impact.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Discussion of Effects: No increases in the current amount of water flow to the Project site are anticipated, and the proposed Project would not deplete groundwater supplies, nor will it interfere with recharge. The water use associated with the proposed use of the property would be negligible. The development of the site would require the grading of the site and excavation is expected to be less than three feet and would not affect the existing aquifer, estimated to be about 230 to 250 feet below the ground surface. No adverse impacts are anticipated.

Mitigation: None required.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site or volume of storm water runoff to cause environmental

harm or potential for significant increases in erosion of the project site or surrounding areas?

Discussion of Effects: It is not anticipated that the Project would alter the drainage pattern of the site or area, in a manner that would result in erosion, siltation or flooding on-or-off site nor would the proposed Project increase the erosion of the subject site or surrounding areas. The existing drainage pattern of the Project site would not be altered, and it would have no significant impact on downstream hydrology. Stormwater generated by the Project would be discharged in compliance with the statewide NPDES General Construction Activities Stormwater Permit and San Bernardino County MS4 permit requirements. With the full implementation of a Storm Water Pollution Prevention Plan (SWPPP) developed in compliance with the General Construction Activities Permit requirements, the BMPs included in the SWPPP, and a stormwater monitoring program would reduce any impacts to below a level of significance. No streams or streambeds are present on the site. No changes in erosion off-site are anticipated.

Mitigation: None required.

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site or potential for significant changes in the flow velocity or volume of storm water runoff to cause environmental harm?

Discussion of Effects: The proposed Project is not anticipated to increase the flow velocity or volume of storm water runoff to cause environmental harm from the site and would not create a burden on existing infrastructure. Furthermore, with the implementation of an approved Water Quality Management Plan (WQMP) developed for the site, in compliance with the San Bernardino County MS4 Permit requirements, stormwater runoff volume shall be reduced to below a level of significance.

Mitigation: None required.

e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff (a&b) during construction and/or post-construction activity?

Discussion of Effects: It is not anticipated that the Project would create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or create or contribute stormwater runoff pollutants during construction and/or post-construction activity. Pursuant to the requirements of The Ontario Plan, the City's Development Code, and the San Bernardino County MS4 Permit's WQMP, individual developments must provide site drainage and WQMP plans according to guidelines established by the City's Engineering Department. If master drainage facilities are not in place at the time of Project development, then standard engineering practices for controlling post-development runoff may be required, which could include the construction of on-site storm water detention and/or retention/infiltration facilities. Therefore, no impacts are anticipated.

Mitigation: None required.

f) Otherwise substantially degrade water quality or potential for discharge of storm water to affect the beneficial uses of receiving water?

Discussion of Effects: Activities associated with the construction period, could result in a temporary increase in the amount of suspended solids in surface flows during a concurrent storm event, thus resulting in surface water quality impacts. The site is required to comply with the statewide NPDES General Construction Permit and the City of Ontario's Municipal Code (Title 6, Chapter 6 (Stormwater Drainage System)) to minimize water pollution. Thus, it is anticipated that there is no potential for discharges of stormwater during construction that would affect the beneficial uses of the receiving waters. However, with the General Construction Permit requirement and implementation of the policies in The Ontario Plan, any impacts associated with the Project would be less than significant. However, as part of the Certified EIR, the following MMs were imposed as part of the development of the OCSP:

Mitigation: Water Quality

MM-WQ-1 During construction, a variety of temporary structural measures such as velocity dissipators, siltation fences or basins and. vegetative buffer zones will be used to reduce siltation and sedimentation runoff from construction sites.

MM-WQ-2 Periodic cleaning of storm drains and inlets, construction of pervious pavement surfaces in areas designated by the City, periodic street sweeping.

MM-WQ-3 Periodic street sweeping will be conducted by the City of Ontario for streets dedicated to the City. Periodic vacuum sweeping will be conducted by the owners of individual sites.

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

Discussion of Effects: The project site is not located within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map. Therefore, no impacts are anticipated.

Mitigation: None required.

h) Place within a 100-year flood hazard area, structures that would impede or redirect flood flows?

Discussion of Effects: As identified in the Safety Element (Exhibit S-2) of the Policy Plan (General Plan), the site lies outside of the 100-year flood hazard area. Therefore, no adverse impacts are anticipated.

Mitigation: None required.

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

Discussion of Effects: As identified in the Safety Element (Exhibit S-2) of The Ontario Plan, the site lies outside of the 100-year flood hazard area. No levees or dams are located near the Project site. Therefore, no adverse impacts are anticipated.

Mitigation: None required.

j) Expose people or structures to inundation by seiche, tsunami or mudflow?

Discussion of Effects: There are no lakes or substantial reservoirs near the project site; therefore, impacts from seiche are not anticipated. The City of Ontario has relatively flat topography, less than two percent across the City, and the chance of mudflow is remote. Therefore, no impacts are anticipated.

Mitigation: None required.

11. LAND USE & PLANNING

Would the project:

a) Physically divide an established community?

Discussion of Effects: The Project site is located in an area that is currently developed with urban land uses. This Project would be of similar design and size to surrounding development. The Project would become a part of the larger commercial, entertainment retail, office, and high-density residential communities, which surround the Project site. No adverse impacts are anticipated.

Mitigation: None required.

b) Conflict with applicable land use plan, policy or regulation of agencies with jurisdiction over the project (including, but not limited to general plan, airport land use compatibility plan, specific plan, or development code) adopted for the purpose of avoiding or mitigation an environmental effect?

Discussion of Effects: The proposed Project is consistent with The Ontario Plan and does not interfere with any policies for environmental protection. As such, no impacts are anticipated.

Mitigation: None required.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

Discussion of Effects: There are no adopted habitat conservation plans in the Project area. As such no conflicts or impacts are anticipated.

Mitigation: None required.

12. MINERAL RESOURCES

Would the project:

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

Discussion of Effects: The Project site is located within a mostly developed area surrounded by urban land uses. There are no known mineral resources in the area. Therefore, no impacts are anticipated.

Mitigation: None required.

b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

Discussion of Effects: There are no known mineral resources in the area. No impacts are anticipated.

Mitigation: None required.

13. NOISE

Would the project result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Discussion of Effects: As noted in Section 3.5.8, Noise, and as shown in Tables 3-8 and 3-9, the Project would not expose people to or generate noise levels in excess of standards as established in The Ontario Plan FEIR (Section 5.12). No additional analysis would be required at the time of site development review.

Mitigation: None required.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Discussion of Effects: The uses associated with this Project normally do not induce groundborne vibrations. As such, no impacts are anticipated. Typical construction vibration is shown on Tables 3-10 and 3-11 which conclude that Project vibration would not expose persons or generate excessive groundborne vibration or noise levels.

Mitigation: None required.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Discussion of Effects: The Project would not be a significant permanent noise generator and would not cause a substantial permanent increase in ambient noise levels because of the limited size and scope of the Project. Moreover, the proposed use would be required to operate within the noise levels permitted for commercial development, pursuant to City of Ontario Development Code. The Project would create typical construction noise as shown in Tables 3-8 and 3-9. Therefore, no increases in noise levels within the vicinity of the project are anticipated.

Mitigation: None required.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Discussion of Effects: Temporary construction activities would minimally impact ambient noise levels. All construction machinery would be maintained according to industry standards to help minimize the impacts. Normal activities associated with the Project are unlikely to increase ambient noise levels. As shown in Tables 3-12, 3-13, and 3-14 show that the Project would not create substantial temporary or periodic increase in ambient noise. A less than significant impact is anticipated.

Mitigation: None required.

e) For a project located within the noise impact zones of the airport land use compatibility plan for ONT and Chino Airports, would the project expose people residing or working in the project area to excessive noise levels?

Discussion of Effects: According to the Safety Element in The Ontario Plan and the Noise Impact Analysis, the proposed site is located within the airport land use plan. However, the Project is located outside of

the 60 CNEL noise contour. Therefore, the exterior noise impact from the airport would be within the allowable limits for residential land uses and the Project is considered compatible with the surrounding land use and noise environment. Noise from airport operations is expected to generate a less than significant on the proposed Project.

Mitigation: None required.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

Discussion of Effects: The Project site is not located within the vicinity of a private airstrip. Therefore, no impacts are anticipated.

Mitigation: None required.

14. POPULATION & HOUSING

Would the project:

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of road or other infrastructure)?

Discussion of Effects: The Project is located in a developed area and would not induce population growth as the proposed multi-family DUs have been previously analyzed as part of the OCSP development in the Certified EIR and population growth as part of the OCSP has already been assumed and accounted for in the General Plan and regionally. Therefore, no impacts are anticipated

Mitigation: None required.

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

Discussion of Effects: The Project site is currently undeveloped. Therefore, no impacts are anticipated.

Mitigation: None required.

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

Discussion of Effects: The Project site is currently undeveloped. Therefore, no impacts are anticipated.

Mitigation: None required.

15. PUBLIC SERVICES

Would the project:

a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

i) Fire protection?

Discussion of Effects: The site is in a developed area currently served by the Ontario Fire Department. As previously noted, the site has already been accounted for in the General Plan that it will be developed to include a greater amount of commercial SF and a larger amount of multi-family DUs. The Project would not require the construction of any new facilities or alteration of any existing facilities or cause a decline in the levels of service, which could cause the need to construct new facilities. No impacts are anticipated. However, as part of the development of the OCSP, the Certified EIR noted that the following MMs would be applicable to the development of the OCSP:

Mitigation: Fire Protection

MM-PS-1 The developer will pay a fair share of "in-lieu" fees to subsidize additional facilities and equipment as mutually agreed upon by both the developer and the City of Ontario.

MM-PS-2 All new development will participate in updating the City of Ontario Water Master Plan and will contribute on a "fair share" basis toward implementation of Master Plan programs.

MM-PS-3 Ontario Fire Department and project developer Will provide, in writing, assurance of water supply adequacy from local water purveyor.

MM-PS-4 Design features at the site plan level will reduce risk of fire hazard. Site plan proposals will be reviewed during site plan review by Ontario Fire Department (OFD). Protection measures recommended by the OFD will be implemented by project proponent.

With implementation of MMs PS-1 through PS-4, a less than significant impact on fire services would occur.

ii) Police protection?

Discussion of Effects: The site is in a developed area, currently served by the Ontario Police Department. The Project would not require the construction of any new facilities or alteration of any existing facilities or cause a decline in the levels of service, which could cause the need to construct new facilities and no impact are anticipated on police protection services. However, as part of the development of the OCSP, the Certified EIR noted that the following MMs would be applicable to the development of the OCSP:

Mitigation: Law Enforcement

MM-PS-5 If a proposed ordinance is adopted, the regional center builder/developer may be required to pay a one-time developer assessment fee to the Police Department at the time of issuance of a building permit. This developer fee will mitigate the fiscal impact incurred by the Police Department.

Due to the projected increase in police calls for service to be generated by the development. The amount of this fee will be established by the Ontario Police Department based on land use and projected calls-for-service from that use.

MM-PS-6 Each individual project within The Ontario Center will incorporate on-site security measures. These measures will be reviewed by the Ontario Police Department. They will include, but not be limited to, limited-height landscaping, exterior lighting, security hardware.

MM-PS-7 In addition to these physical security and lighting requirements, the Police Department requests that the developer submit a plan delineating which functions are to be addressed by on-site private security and what functions are to be served by the Police Department. This

plan may include personnel selection and training and physical security measures, i.e., video surveillance, emergency call boxes, communication and alarms. This plan shall be approved by the Police Department prior to implementation.

With implementation of MMs PS-5 through PS-7, a less than significant impact on police services would occur.

iii) Schools?

Discussion of Effects: The Project would be required to pay school fees as prescribed by state law prior to the issuance of building permits. However, as part of the development of the OCSP, the Certified EIR noted that the following MMs would be applicable to the development of the OCSP:

Mitigation: School

MM-PS-8 Developers of residential projects within The Ontario Center will pay required school impact mitigation fees of $29,000 gross acre to Cucamonga School District per agreement reached between the District and the developer dated December 31, 1986.

MM-PS-9 Developers of projects within The Ontario Center will pay fees, as noted below, to the Chaffey Joint Unified School District:

Residential $.48/square foot

Commercial/Industrial/Office $.08/square foot

iv) Parks?

Discussion of Effects: The site is in a developed area, currently served by the City of Ontario. The Project would not require the construction of any new facilities or alteration of any existing facilities or cause a decline in the levels of service, which could cause the need to construct new facilities. However, as part of the development of the OCSP, the Certified EIR noted that the following MMs would be applicable to the development of the OCSP:

Mitigation: Parks and Recreation

MM-PS-10 Regional Parks: The responsibility for rehabilitating existing regional parks and/or building new facilities, rests with the County of San Bernardino Parks Department. A Draft Ordinance has been prepared by the County Parks Department which will require developers to pay fees for future parks and open space. Developers within The Ontario Center shall comply with the City of Ontario's implementation of the County's fee ordinance for the collection of development fees for regional parks, trails, and open space if and when it is enacted.

MM-PS-11 Local Parks: A Park Development Fund Fee of $802/single family detached unit and $700/multiple family unit will be paid at the time of issuance of building permits.

MM-PS-12 Private recreational opportunities shall be encouraged for the commercial retail/industrial use areas.

v) Other public facilities?

Discussion of Effects: The site is in a developed area, currently served by the City of Ontario. The Project would not require the construction of any new facilities or alteration of any existing facilities or cause a decline in the levels of service, which could cause the need to construct new facilities. No impacts are anticipated.

Mitigation: None required.

16. RECREATION

Would the project:

a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that have an adverse physical effect on the environment?

Discussion of Effects: This Project is not proposing any significant new housing or large employment generator that would cause an increase in the use of neighborhood parks or other recreational facilities that have not already been analyzed as part of the OCSP or the Certified EIR and/or considered in the General Plan. Implementation of the proposed Project would not require the construction of neighborhood parks or other recreational facilities. No impacts are anticipated.

Mitigation: None required.

17. TRANSPORTATION/TRAFFIC

Would the project:

A Project-specific Traffic Impact Analysis was prepared by RK Engineering Group. The results are provided herein, and the technical study is included as Appendix A of this Addendum.

a) Conflict with a program plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?

Discussion of Effects: The Project is in an area that is mostly developed with all street improvements existing. As noted in Table 3-3, the number of vehicle trips per day is forecast at 5,691 daily trips or 5.4 percent compared to the allowable 105,332 daily trips allowable per the OCSP for the site. Therefore, as noted in Section 3.5.5, Traffic and Circulation, the Project would not create a substantial increase in the number of vehicle trips, traffic volume or congestion at intersections and would not conflict with an applicable plan, ordinance, or policy addressing the circulation system, transit, roadway, bicycle, or pedestrian facilities. Less than significant impacts are anticipated. However, as part of the Certified EIR, the following MMs were imposed as part of the development of the OCSP:

Mitigation: Traffic and Transportation

MM-TRF-1 Buildout in the project vicinity of the proposed circulation system defined in the Specific Plan Amendment will occur.

MM-TRF-2 Development and implementation of a Transportation Systems Management (TSM) program with a goal of a ten percent reduction in peak hour trips will occur as defined the Specific Plan Amendment.

MM-TRF-3 Applicants for all future specific plans and specific plan amendments in the vicinity of The Ontario Center project will be required to complete traffic impact and mitigation studies to ensure that the forty (40) intersections studied this EIR will not exceed an intersection capacity utilization greater than Level of Service E.

With implementation of the applicable Certified EIR MMs, the Project would have a less than significant impact.

b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

Discussion of Effects: As noted in Section 3.5.5.1, CEQA Vehicle Miles Traveled, the Project is found to have a less than significant impact regarding VMT.

Mitigation: None required.

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

Discussion of Effects: The Project would not create a substantial safety risk or interfere with air traffic patterns at Ontario International Airport as it either is outside of areas with FAA-imposed height restrictions or is under such height restrictions. No impacts are anticipated.

Mitigation: None required.

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Discussion of Effects: The Project is in an area that is mostly developed. All street improvements are complete, and no alterations are proposed for adjacent intersections or arterials. The Project would, therefore, not create a substantial increase in hazards due to a design feature. No impacts are anticipated.

Mitigation: None required.

e) Result in inadequate emergency access?

Discussion of Effects: The Project would be designed to provide access for all emergency vehicles and would therefore not create an inadequate emergency access. No impacts are anticipated.

Mitigation: None required.

18. TRIBAL CULTURAL RESOURCES

Would the project:

a) Cause a substantial adverse change in the significance of a Tribal Cultural Resource as defined in Public Resources Code Section 21074?

Discussion of Effects: The proposed Project is in an area that has been previously disturbed by development. No known Tribal Cultural Resource sites exist within the Project area. Thus, tribal artifacts are not expected to be encountered during any excavation, grading, or construction activities.

Mitigation: None required.

19. UTILITIES AND SERVICE SYSTEMS

Would the project:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Discussion of Effects: The proposed Project is served by the City of Ontario sewer system, which has waste treated by the Inland Empire Utilities Agency at the RP-1 and/or RP-5 treatment plant. The Project is required to meet the requirements of the Ontario Engineering Department regarding wastewater. Additionally, as noted in Section 2.3, Land Use and Development, the proposed Project would implement a Project at a much lower development intensity than the originally approved project under the OCSP and the Certified EIR. As such, no impacts are anticipated.

Mitigation: None required.

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Discussion of Effects: The proposed Project is served by the City of Ontario sewer system and which has waste treated by the Inland Empire Utilities Agency at the RP-1 and/or RP-5 treatment plant. RP-1 and/or RP-5 is not at capacity and this Project would not cause RP-1 and/or RP-5 to exceed capacity. The Project would, therefore, not require the construction of new wastewater treatment facilities, or the expansion of existing facilities. No impacts are anticipated.

Mitigation: None required.

c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Discussion of Effects: The proposed Project is served by the City of Ontario. The Project is required to meet the requirements of the Ontario Engineering Department regarding storm drain facilities. Because the Project is much less intense than the previously approved project on the same footprint, no impacts are anticipated.

Mitigation: None required.

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed? In making this determination, the City shall consider whether the project is subject to the water supply assessment requirements of Water Code Section 10910, et seq. (SB 610), and the requirements of Government Code Section 664737 (SB 221).

Discussion of Effects: The Project is served by the City of Ontario water system. There is currently a sufficient water supply available to the City of Ontario to serve this project. Additionally, as noted in Table 2-4, the Project is anticipated to require 316,027 GPD compared to the 727,888 GPD of the originally approved project and analyzed under Certified EIR. The proposed Project would require approximately 54 percent of the originally accounted for water demand. Although a less than significant impact is anticipated in this regard, the Certified EIR included the following MMs as part of the original OCSP analysis.

Mitigation: Water Supply

MM-UTL-1 All existing and future users will share in costs of supplemental city-wide water supply system.

MM-UTL-2 Reclaimed water, as it is available from CBMWD Regional Plant No. 4, will be used for open space irrigation when economically feasible.

MM-UTL-3 Cooperation between CBMWD, the City of Ontario, developers of The Ontario Center and other landowners will be necessary to ensure adequate capacity.

A less than significant impact would occur with implementation of MMs UTL-1 through UTL-3.

e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Discussion of Effects: The proposed Project is served by the City of Ontario sewer system, which has waste treated by the Inland Empire Utilities Agency at the RP-1 and/or RP-5 treatment plant. RP-1 and/or RP-5 is not at capacity and this project would not cause RP-1 and/or RP-5 to exceed capacity. Although no impact is anticipated in this regard, the Certified EIR included the following MMs as part of the original OCSP analysis.

Mitigation: Wastewater

MM-UTL-4 Design and construction of wastewater collection facilities within the Ontario Center will be completed under the jurisdiction of the City of Ontario.

MM-UTL-5 Any plans for use of the non-reclaim able waste line (NRW) system will be made known to the City and CBMWD.

MM-UTL-6 Wastewater collection facilities will be designed so that all parcels can be served by gravity mains without pumping.

MM-UTL-7 The Ontario Center project development will coordinate construction activities with the City of Ontario and CBMWD to assure adequate interceptor, trunk sewer and treatment plant capacity is available as development proceeds.

MM-UTL-8 Continued coordination between CBMWD, the City, developers of The Ontario Center, and other property owners/developers will occur to assure adequate capacity is available in the Cucamonga Interceptor as development occurs within the tributary area.

A less than significant impact would occur with implementation of MMs UTL-4 through UTL-8.

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Discussion of Effects: City of Ontario serves the proposed Project. Currently, the City of Ontario contracts with a waste disposal company that transports trash to a landfill with sufficient capacity to handle the City's solid waste disposal needs. No impacts are anticipated. Although no impact is anticipated in this regard, the Certified EIR included the following MM as part of the original OCSP analysis.

Mitigation: Solid Waste

MM-UTL-9 Solid waste will be disposed of in Milliken Landfill. Upon closing of the Milliken Landfill, waste will be disposed of at the San Timoteo Landfill. A transfer station for the City will be constructed by the City in the next 2 to 3 years to transport waste from Ontario to the San Timoteo Landfill.

A less than significant impact would occur with implementation of MM UTL-9.

g) Comply with federal, state, and local statutes and regulations related to solid waste?

Discussion of Effects: This Project would comply with federal, state, and local statutes and regulations regarding solid waste. Therefore, no impacts are anticipated.

Mitigation: None required.

20. Wildfire

Would the project:

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

Discussion of Effects: According to the General Plan and CAL FIRE, the Project site is not located within a Very High, High, or Medium Fire Hazard area. The Project would not interfere with the City's Emergency Management Plan because it does not contain any features that would prohibit the execution of such plans. The Project would maintain the existing ingress and egress which were designed to accommodate existing and future growth of the site. No impacts are anticipated.

Mitigation: None required.

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

Discussion of Effects: Like most of southern California, the City of Ontario faces a diverse array of potential natural hazards. The General Plan notes that severe windstorms can pose a significant risk to property and life in the region by creating conditions that disrupt essential systems such as public utilities, telecommunications, and transportation routes. High winds, including Santa Ana winds, can cause damage to homes, businesses, landscaping, public property, and utilities, and pose threats to public safety, including accelerating a fire. The alluvial sand that underlies the majority of Ontario is generally granular, poorly consolidated, and very susceptible to erosion. In strong winds this sand can impact property, air quality and visibility. However, no special circumstances occur on the Project that do not occur in the rest of the City of region. No impact from wind hazards is anticipated to occur.

Mitigation: None required.

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

Discussion of Effects: All proposed Project components would be within the Project site property lines, and impacts associated with the development of the Project within this footprint area analyzed throughout this document and has been previously analyzed in the Certified EIR. No impacts are anticipated to occur.

Mitigation: None required.

d) Expose people or structures to significant risks, including downslope, or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

Discussion of Effects: As previously analyzed in the Certified EIR, the Project site is not located in a landslide hazard area or a floodplain. No changes in findings in this regard would occur compared to those findings in the Certified EIR for the Project site. As such, no impact in this regard would occur.

Mitigation: None required.

21. MANDATORY FINDINGS OF SIGNIFICANCE

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat or a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Discussion of Effects: The site is located within an area that has been previously heavily disturbed, mass graded, and partially developed with various uses including multi-family residential DUs and commercial. The Project is not anticipated to have the potential to degrade the quality of the environment or reduce the overall habitat as there is no native habitat.

b) Does the project have the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals?

Discussion of Effects: The Project does not have the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals. As shown throughout this addendum, the Project would not cause any more intense impacts than those already previously considered in the Certified EIR, CEA, POCA, and POOC environmental documents.

Mitigation: None required.

c) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current project, and the effects of probable future projects.)

Discussion of Effects: The Project does not have impacts that are cumulatively considerable that have not already been considered in the Certified EIR, CEA, POCA, and POOC environmental documents.

Mitigation: None required.

d) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?

Discussion of Effects: The Project does not have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly.

Mitigation: None required.

APPENDIX A
TRAFFIC IMPACT ANALYSIS

TOYOTA ARENA MIXED-USE DEVELOPMENT
TRAFFIC IMPACT ANALYSIS
City of Ontario, California

Prepared for:

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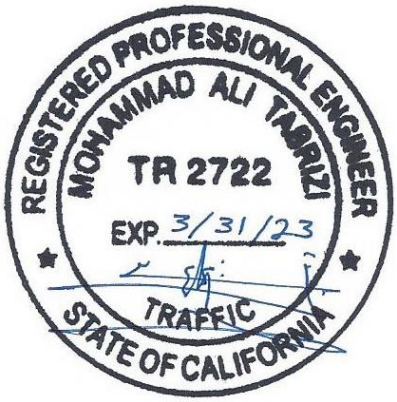

September 17, 2021

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1.0 Introduction

1.1 Purpose of Report and Study Objectives

The purpose of this traffic study is to assess the impacts of the proposed Toyota Arena Mixed-Use Development (hereinafter referred to as project) from a traffic and circulation stand point.

This study has been conducted in accordance with the guidelines detailed in *The Ontario General Plan Update Transportation Technical Report (March 19, 2009)* and recommendations and practices described in the *City of Ontario Planning Commission Resolution No. PC20-021 (May 26, 2020).*

The study has been prepared in accordance with the scope of work discussed and approved by City staff prior to initiating the analysis.

1.2 Site Location & Project Description

The proposed project is located adjacent to the Toyota Arena, north of Concours Street and south of 4th Street, in the City of Ontario.

The land uses surrounding the site include residential uses to the north, commercial uses to the south and west, and commercial and retail uses to the east at the Ontario Mills Shopping Center. The proposed project consists of the construction and operation of a mixed-use town center development with residential and commercial/retail land uses. The following is a breakdown of the project's development plan:

Proposed Development Plan

Lot	Dwelling Units (DU)	Retail (SF)	Parking Spaces
A	359	25,256	477*
B	98	20,802	130*
C	107	11,047	142*
D	127	14,095	170*
F & G	- -	- -	1,170
Total	**691**	**71,200**	**2,089**

* Parking structure

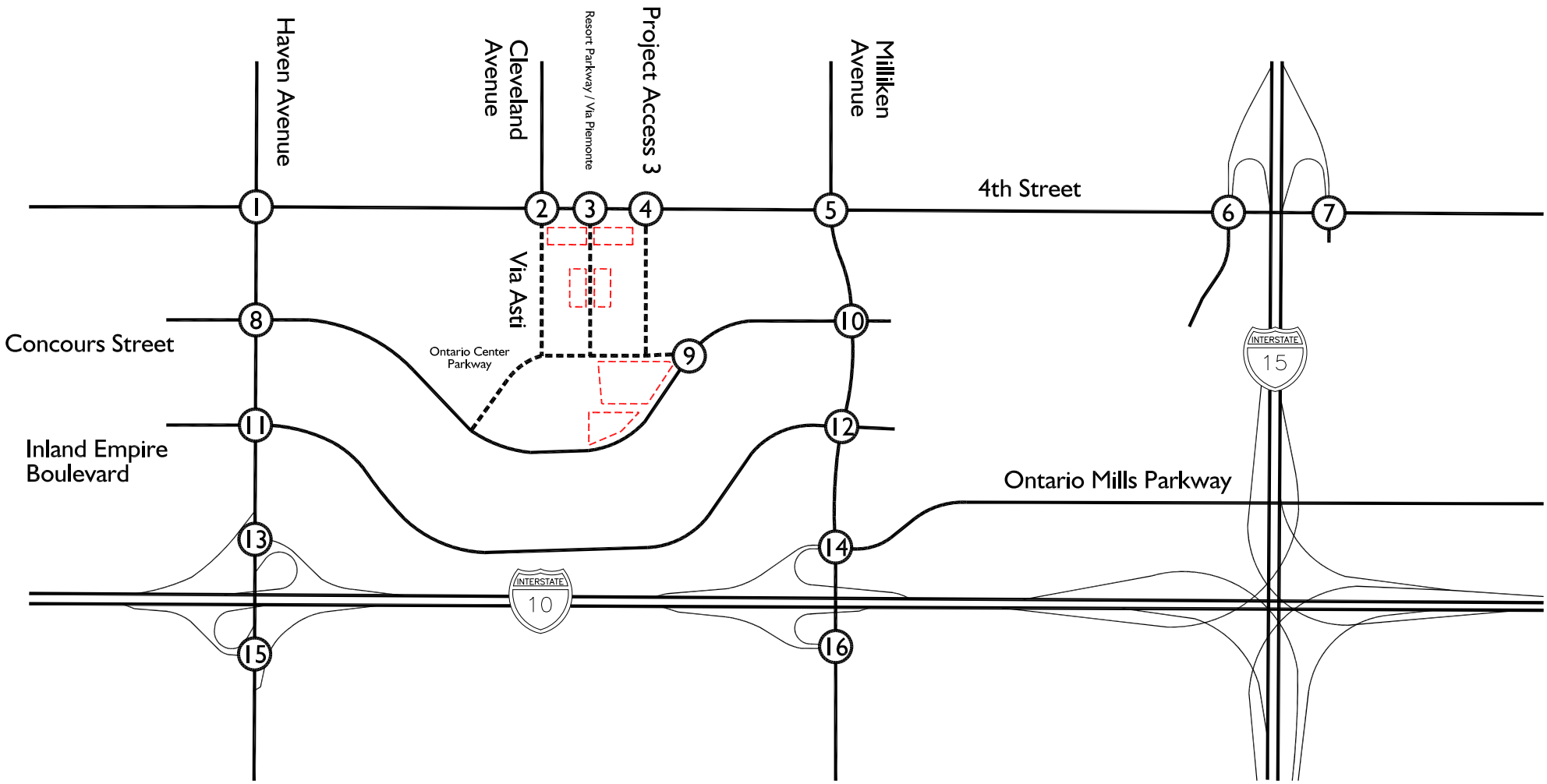
Main access for the project is planned via the following:

- One (1) signalized intersection at Cleveland Avenue – Via Asti / 4th Street;
- One (1) signalized intersection at Resort Parkway – Via Piemonte / 4th Street;
- One (1) right-in/right-out access driveway along 4th Street; and

The project is planned to open in 2023 and will be evaluated in one single phase.

The project site's location map is shown in Exhibit 1-1. The project site plan is shown in Exhibit 1-2.

Location Map



Legend:

(1) = Study Area Intersections

--- = Project Site Boundary

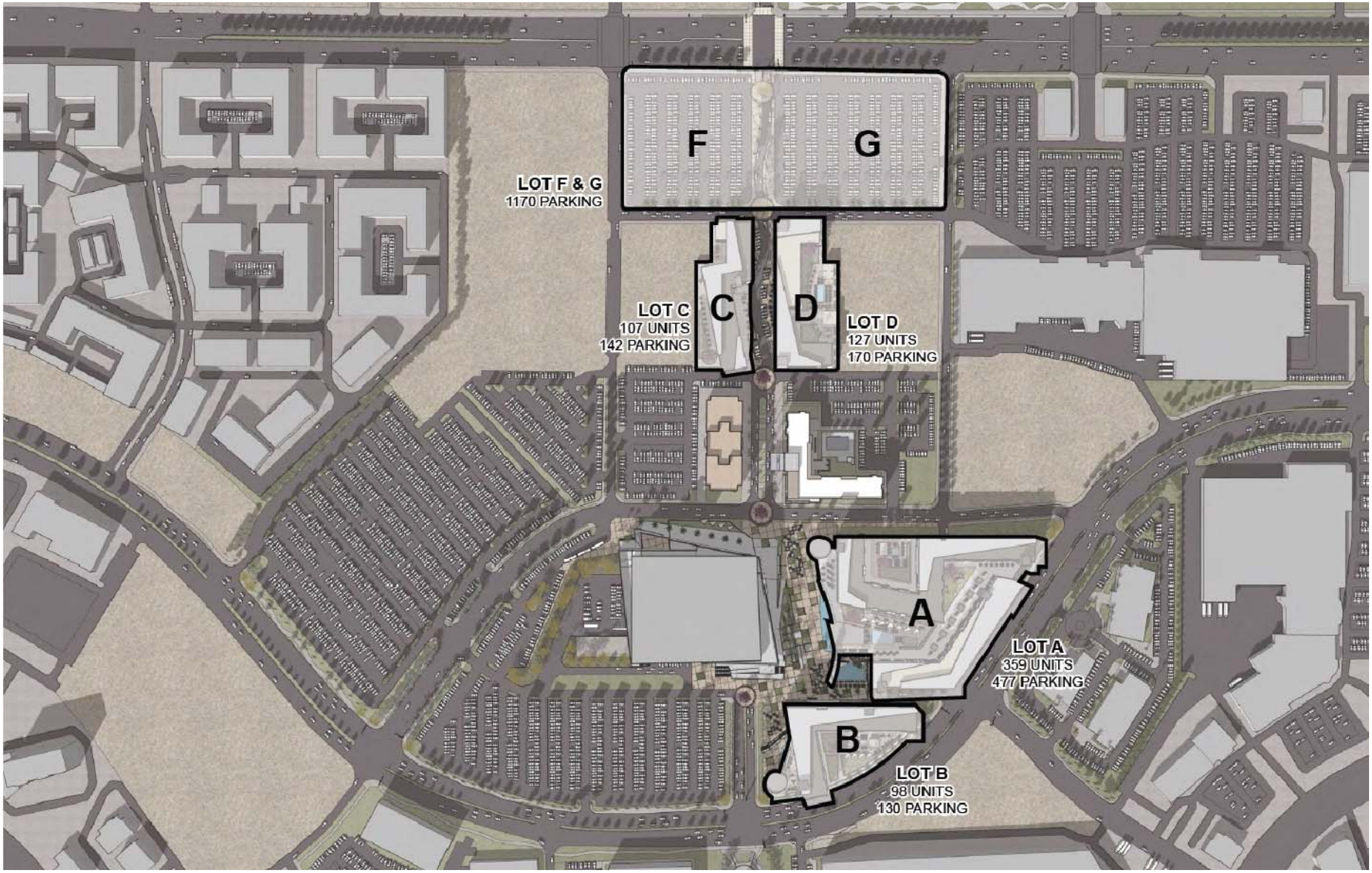
▬ = Project Access Way

N

RK engineering group, inc.

Exhibit 1-

Site Plan



2.0 Study Area & Analysis Methodologies

This section of the report presents the analysis study area and the methodologies used to perform the traffic analyses summarized in this report in accordance with the City of Ontario requirements.

Furthermore, this section of the report also discusses the agency-established performance criteria and thresholds of significance for the study facilities.

2.1 Study Area

The traffic analysis study area includes intersections where the proposed project may potentially create traffic impacts to traffic operations and conditions.

The traffic impact analysis evaluates the following study area intersections:

1. Haven Avenue (NS) / 4TH Street (EW);
2. Cleveland Avenue – Via Asti (NS) / 4th Street (EW);
3. Resort Parkway – Via Piemonte (NS) / 4th Street (EW);
4. Project Access 3 (NS) / 4th Street (EW);
5. Milliken Avenue (NS) / 4th Street (EW);
6. I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW);
7. I-15 NB Ramps (NS) / 4th Street (EW);
8. Haven Avenue (NS) / Concours Street (EW);
9. Concours Street (NS) / Ontario Center Parkway (EW);
10. Milliken Avenue (NS) / Concours Street (EW);
11. Haven Avenue (NS) / Inland Empire Boulevard (EW);

12. Milliken Avenue (NS) / Inland Empire Boulevard (EW);

13. Haven Avenue (NS) / I-10 WB Ramps (EW);

14. Milliken Avenue (NS) / Ontario Mills Parkway – I-10 WB Ramps (EW);

15. Haven Avenue (NS) / I-10 EB Ramps (EW); and

16. Milliken Avenue (NS) / I-10 EB Ramps (EW).

The study evaluates the following study scenarios for AM, PM, and Saturday peak hour conditions:

- Existing Conditions;
- Existing Plus Project Conditions;
- Project Opening Year Without Related Projects Without Project Conditions;
- Project Opening Year Without Related Projects With Project Conditions;
- Project Opening Year With Related Projects Without Project Conditions;
- Project Opening Year With Related Projects With Project Conditions;
- Horizon Year (2040) Without Project Conditions; and
- Horizon Year (2040) With Project Conditions.

The analysis evaluates the following time frames:

- Weekday AM peak period of 7:00 AM to 9:00 AM
- Weekday PM peak period of 4:00 PM to 6:00 PM
- Saturday mid-day peak period of 12:45 PM to 2:45 PM (Saturday peak period of traffic was determined by review of existing 24-hour volumes in the project site vicinity)

2.2 Study Intersection Peak Hour Level of Service Analysis Methodology

In accordance with *The Ontario General Plan Update Transportation Technical Report (March 19, 2009)*, the Highway Capacity Manual Sixth Edition (HCM 6) is utilized as the technical guide in the evaluation of traffic operations.

The HCM defines level of service as a qualitative measure which describes operational conditions within a traffic stream, generally in terms of factors such as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The criteria used to evaluate LOS (Level of Service) conditions vary based on the type of roadway and whether the traffic flow is considered interrupted or uninterrupted.

The definitions of level of service for uninterrupted flow (flow unrestrained by the existence of traffic control devices) are:

- **LOS A** represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream.

- **LOS B** is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver.

- **LOS C** is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream.

- **LOS D** represents high-density but stable flow. Speed and freedom to maneuver are severely restricted, and the driver experiences a generally poor level of comfort and convenience.

- **LOS E** represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Small increases in flow will cause breakdowns in traffic movement.

- **LOS F** is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations.

The level of service is typically dependent on the quality of traffic flow at the intersections along a roadway. The HCM methodology expresses the level of service at an intersection in terms of delay time for the various intersection approaches. The HCM uses different procedures depending on the type of intersection control. The levels of service determined in this study are calculated using the HCM methodology.

For signalized intersections, average control delay per vehicle is used to determine the level of service. Levels of service at signalized study intersections have been evaluated using the HCM intersection analysis program.

Study area intersections, which are stop sign controlled with stop control on the minor street only, have been analyzed using the unsignalized intersection methodology of the HCM. For these intersections, the calculation of level of service is dependent on the occurrence of gaps occurring in the traffic flow of the main street. Using data collected, describing the intersection configuration and traffic volumes at these locations, the level of service has been calculated. The level of service is determined based on the worst individual movement or movements sharing a single lane. The relationship between level of service and delay is different than for signalized intersections.

Table 2-1 shows the level of service criteria based on the HCM methodology.

Table 2-1
HCM Level of Service – Vehicle Delay

LOS	Intersection LOS Criteria	
	Signalized Delay (Seconds)	Unsignalized Delay (Seconds)
A	0.00 - 10.00	0.00 - 10.00
B	10.01 - 20.00	10.01 - 15.00
C	20.01 - 35.00	15.01 - 25.00
D	35.01 - 55.00	25.01 - 35.00
E	55.01 - 80.00	35.01 - 50.00
F	>80.01	>50.01

This analysis also utilizes recommended saturation flow rate described in the *San Bernardino County Congestion Management Program 2016 Update, June 2016, 2021*. The

following saturation flow rates were utilized in the evaluation of LOS for Existing, Opening Year, and Horizon Year (2040) scenarios:

Existing and Opening Year Scenarios

- Exclusive Thru: 1,800 vehicles per hour green per lane (vphgpl)
- Exclusive Left: 1,700 vphgpl
- Exclusive Right: 1,800 vphgpl
- Exclusive Double Left: 1,600 vphgpl
- Exclusive Triple Left: 1,500 vphgpl

Horizon Year (2040) Scenarios

- Exclusive Thru: 1,900 vphgpl
- Exclusive Left: 1,800 vphgpl
- Exclusive Right: 1,900 vphgpl
- Exclusive Double Left: 1,700 vphgpl
- Exclusive Triple Left: 1,600 vphgpl

2.3 Study Intersection Level of Service (LOS) Performance Criteria & Thresholds for Requiring Improvements

The following is a summary of the performance criteria adopted by the City of Ontario.

Performance Criteria:

The acceptable LOS for intersections in the City of Ontario is **LOS E or better** as established in the City's General Plan. Any intersection operating at a LOS F is considered deficient.

Threshold for Requiring Level of Service Improvements:

Any study intersection operating at a deficient LOS (LOS F) will require improvements to restore the intersection to acceptable conditions (LOS E).

2.4 VMT Analysis Methodology, Performance Criteria, & Thresholds of Significance

Effective July 1st, 2020, the longstanding metric of roadway level of service (LOS), which is typically measured in terms of vehicle delay, roadway capacity and congestion, will no longer be considered a significant impact under the California Environmental Quality Act (CEQA). Pursuant to CEQA Guidelines, Section 15064.3, VMT is now the most appropriate measure of transportation impacts.

The City of Ontario follows the guidelines detailing the appropriate VMT methodologies, thresholds of significance, and feasible mitigation measures as described in the *City of Ontario Planning Commission Resolution No. PC20-021 (May 26, 2020).*

This analysis follows the practices and recommendations in the *City of Ontario Planning Commission Resolution No. PC20-021 (May 26, 2020).*

3.0 Existing Traffic Volumes & Circulation System

This section provides a discussion of existing study area conditions and traffic volumes.

3.1 Existing Traffic Controls and Intersection Geometrics

Exhibit 3-1 identifies the existing roadway conditions within the study area. The number of through traffic lanes for existing roadways and existing intersection controls are identified. The type of traffic control and number of lanes at an intersection are key inputs for the calculation of level of service.

3.2 Existing Traffic Volumes

Due to the effects of the COVID-19 pandemic, collection of new and valid traffic counts may not be feasible. After discussions with City staff, methodologies were approved to utilize historical traffic data that predate the impacts of the COVID-19 pandemic after application of a two percent (2%) growth rate per year to derive existing (2021) traffic conditions.

As previously noted, the analysis evaluates the following time frames:

- Weekday AM peak period of 7:00 AM to 9:00 AM
- Weekday PM peak period of 4:00 PM to 6:00 PM
- Saturday mid-day peak period of 12:45 PM to 2:45 PM (Saturday peak period of traffic was determined by review of existing 24-hour volumes in the project site vicinity)

Existing Conditions – Weekday:

After reviewing available pre-pandemic traffic count data provided by RK's traffic count sub-consultants, pre-pandemic traffic counts (years vary) were identified for all study area intersections with exception to the following. For all the locations that pre-pandemic data was available, RK derived Existing 2021 non pandemic conditions traffic volumes by applying an annual growth rate of 2 percent per year to bring the older counts to 2021 conditions.

- Cleveland Avenue – Via Asti (NS) / 4th Street (EW);
- Resort Parkway – Via Piemonte (EW);
- Project Access 3 (NS) / 4th Street (EW); and
- Concours Street (NS) / Ontario Center Parkway (EW).

As a result, the following methodology was performed to derive valid weekday conditions existing (2021) traffic count data for the aforementioned study intersections.

1. ***Collect 2021 Field Counts:*** Existing (2021) traffic count data were collected at the following intersections:
    - Cleveland Avenue – Via Asti (NS) / 4th Street (EW);
    - Resort Parkway – Via Piemonte (NS) / 4th Street (EW);
    - Project Access 3 (NS) / 4th Street (EW);
    - Concours Street (NS) / Ontario Center Parkway (EW); and
    - The nearby intersection of Milliken Avenue (NS) / 4th Street (EW)
2. ***Derive 2021 Counts from Pre-Pandemic Counts:*** Using the available pre-pandemic conditions traffic counts from 2016 at the nearby Milliken Avenue / 4th Street intersection, RK projected 2021 traffic count data for the Milliken Avenue / 4th Street intersection from the 2016 pre-pandemic counts by applying a growth rate of two percent (2%) per year for five (5) years.
3. ***Determine Adjustment Factor for Converting Pandemic Conditions to Non-pandemic Conditions:*** RK compared the 2021 field collected counts at the nearby intersection of Milliken Avenue / 4th Street as part of Step 1 to the derived 2021 traffic count volumes at this intersection from Step 2 and determine an appropriate adjustment factor to convert between pandemic and non-pandemic conditions.

4. ***Derive 2021 Non-Pandemic Conditions Counts at the Study Intersection:*** Using the adjustment factor derived as part of Step 3, RK converted the 2021 counts collected at the other four (4) study intersections defined in Step 1 into non-pandemic traffic volumes for 2021.

Exhibit 3-2 shows the weekday conditions existing (2021) conditions traffic volumes for the study area.

Existing Conditions – Saturday:

No historical pre-pandemic traffic count data was available for Saturday Conditions. As a result, the following methodology was performed to derive valid Saturday conditions existing (2021) traffic count data.

In order to determine the Saturday two-hour timeframe to evaluate traffic conditions for the proposed project, a newly collected 24-hour Saturday ADT was obtained along the segment of:

- 4th Street from Haven Avenue to Milliken Avenue.

The Saturday peak two-hour time frame was identified from the newly collected 24-hour Saturday ADT, RK utilized the following methodology in order to derive valid existing Saturday (2021) traffic count data for the sixteen (16) study area intersections.

1. **Collect 24-Hour ADT Counts:** A newly collected 24-hour ADT along the segment of *4th Street from Haven Avenue to Milliken Aven*ue was performed to determine the Saturday two-hour timeframe of analysis.

2. ***Collect 2021 Field Counts:*** Existing Saturday (2021) traffic count data was newly collected at all study area intersections.

3. ***Utilize Adjustment Factor for Converting Pandemic Conditions to Non-pandemic Conditions:*** Utilizing the adjustment factor derived in Step 3 of the weekday conditions traffic count methodology, RK converted the newly collected existing Saturday (2021) pandemic conditions counts to existing Saturday (2021) non-pandemic conditions.

Exhibit 3-3 shows the Saturday conditions existing (2021) conditions traffic volumes for the study area.

The weekday and Saturday traffic count worksheets are included in Appendix A.

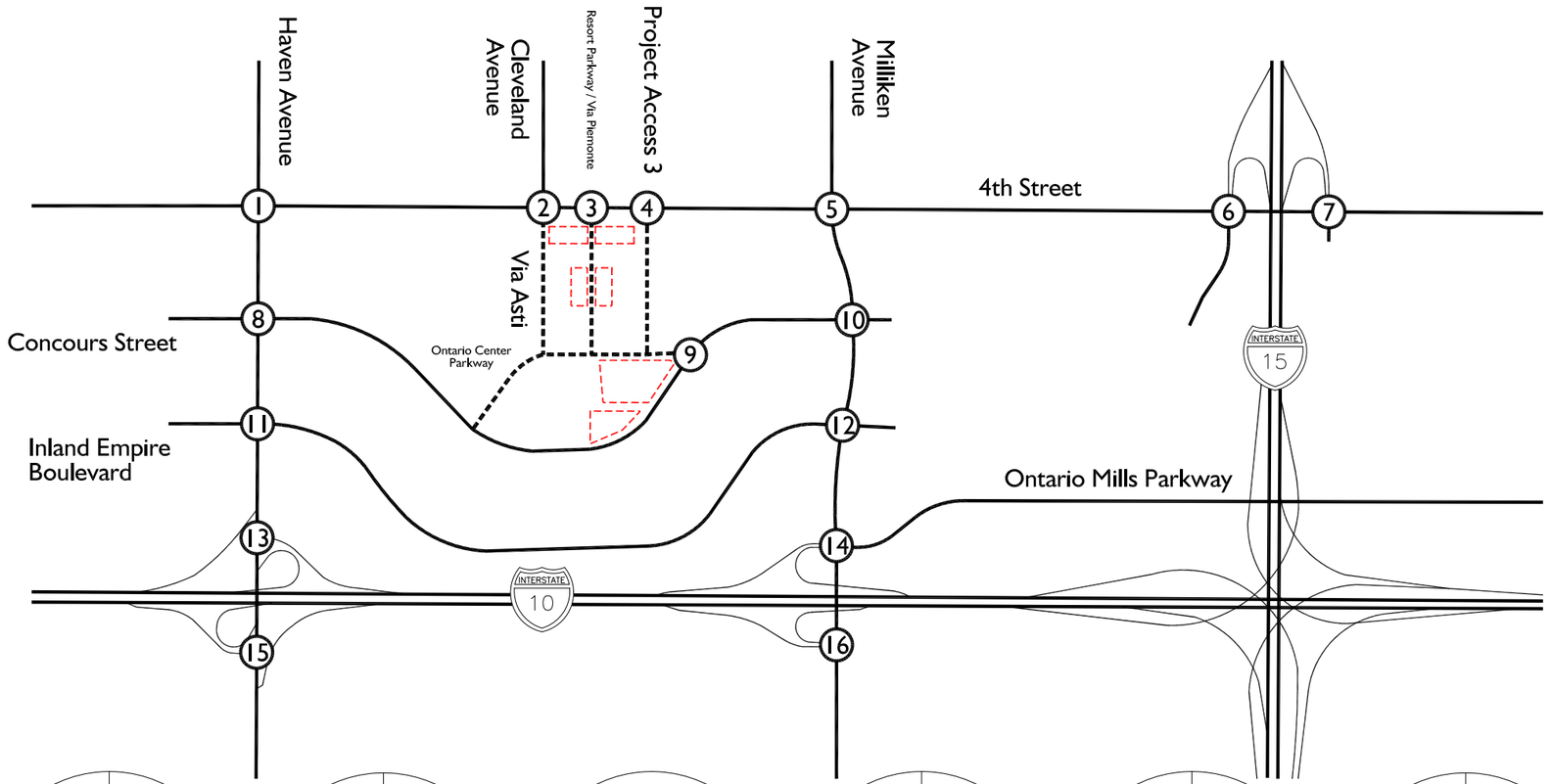
3.3 City of Ontario Circulation Element

The City of Ontario Typical Street Cross Sections are shown in Exhibit 3-4.

The City of Ontario Master Plan of Streets and Highways are shown in Exhibit 3-5.

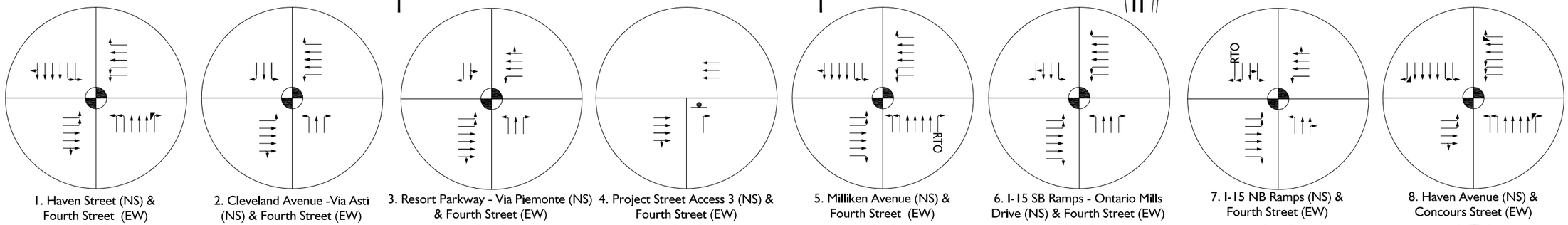
The City of Ontario Trucks Routes are shown in Exhibit 3-6.

Existing Lane Geometry & Traffic Controls



Legend:

- = Traffic Signal
- RTO = Right Turn Overlap
- = Free Right Turn
- = Defacto Right Turn
- = Stop Sign

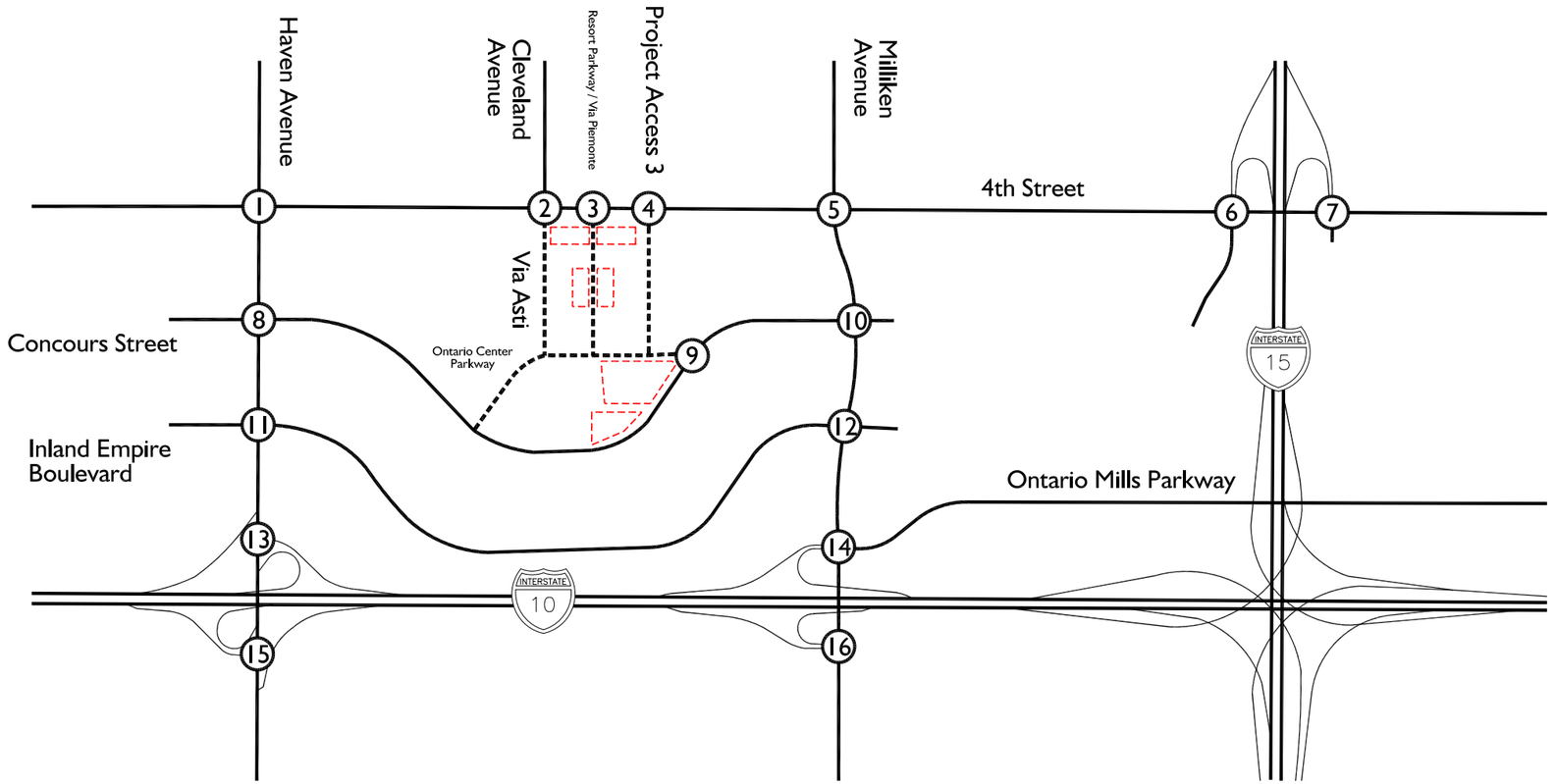


1. Haven Street (NS) & Fourth Street (EW)
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)
4. Project Street Access 3 (NS) & Fourth Street (EW)
5. Milliken Avenue (NS) & Fourth Street (EW)
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)
7. I-15 NB Ramps (NS) & Fourth Street (EW)
8. Haven Avenue (NS) & Concours Street (EW)
9. Concours Street (NS) & Ontario Center Parkway (EW)
10. Milliken Street (NS) & Concours Street (EW)
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)
13. Haven Avenue (NS) & I-10 WB Ramps (EW)
14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)
15. Haven Avenue (NS) & I-10 EB Ramps (EW)
16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

N

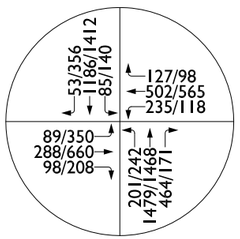
Exhibit 3-1

Existing Conditions Traffic Volume - Weekday

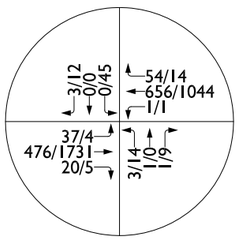


Legend:

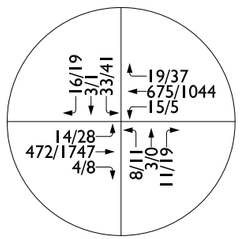
10/20 = AM/PM Peak Hour Volumes



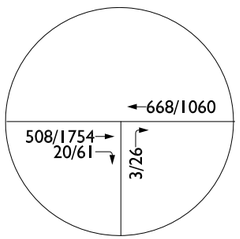
1. Haven Street (NS) & Fourth Street (EW)



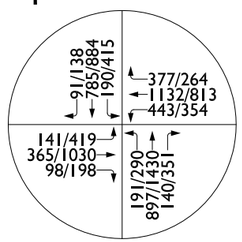
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)



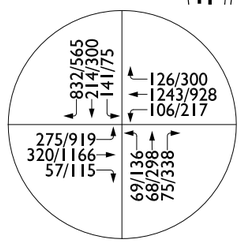
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)



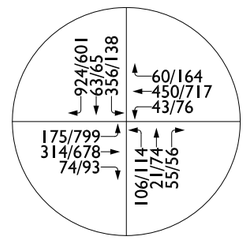
4. Project Street Access 3 (NS) & Fourth Street (EW)



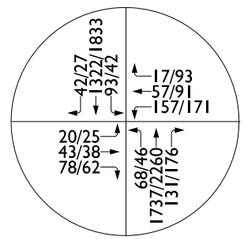
5. Milliken Avenue (NS) & Fourth Street (EW)



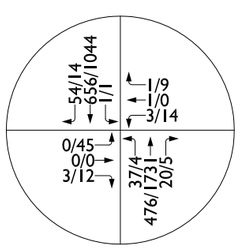
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)



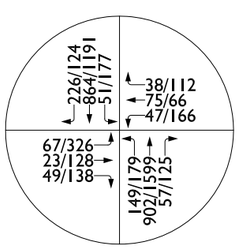
7. I-15 NB Ramps (NS) & Fourth Street (EW)



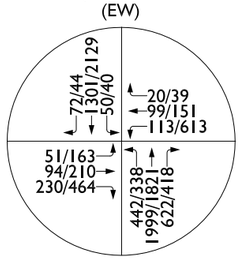
8. Haven Avenue (NS) & Concours Street (EW)



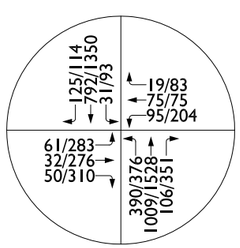
9. Concours Street (NS) & Ontario Center Parkway (EW)



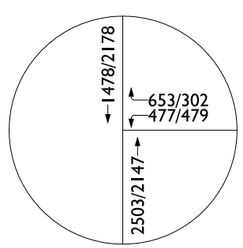
10. Milliken Street (NS) & Concours Street (EW)



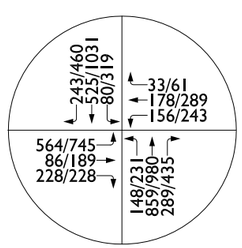
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)



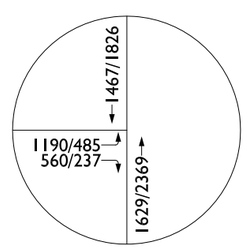
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)



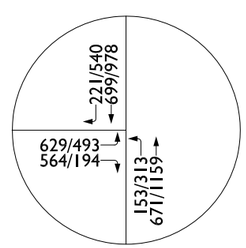
13. Haven Avenue (NS) & I-10 WB Ramps (EW)



14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)



15. Haven Avenue (NS) & I-10 EB Ramps (EW)



16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

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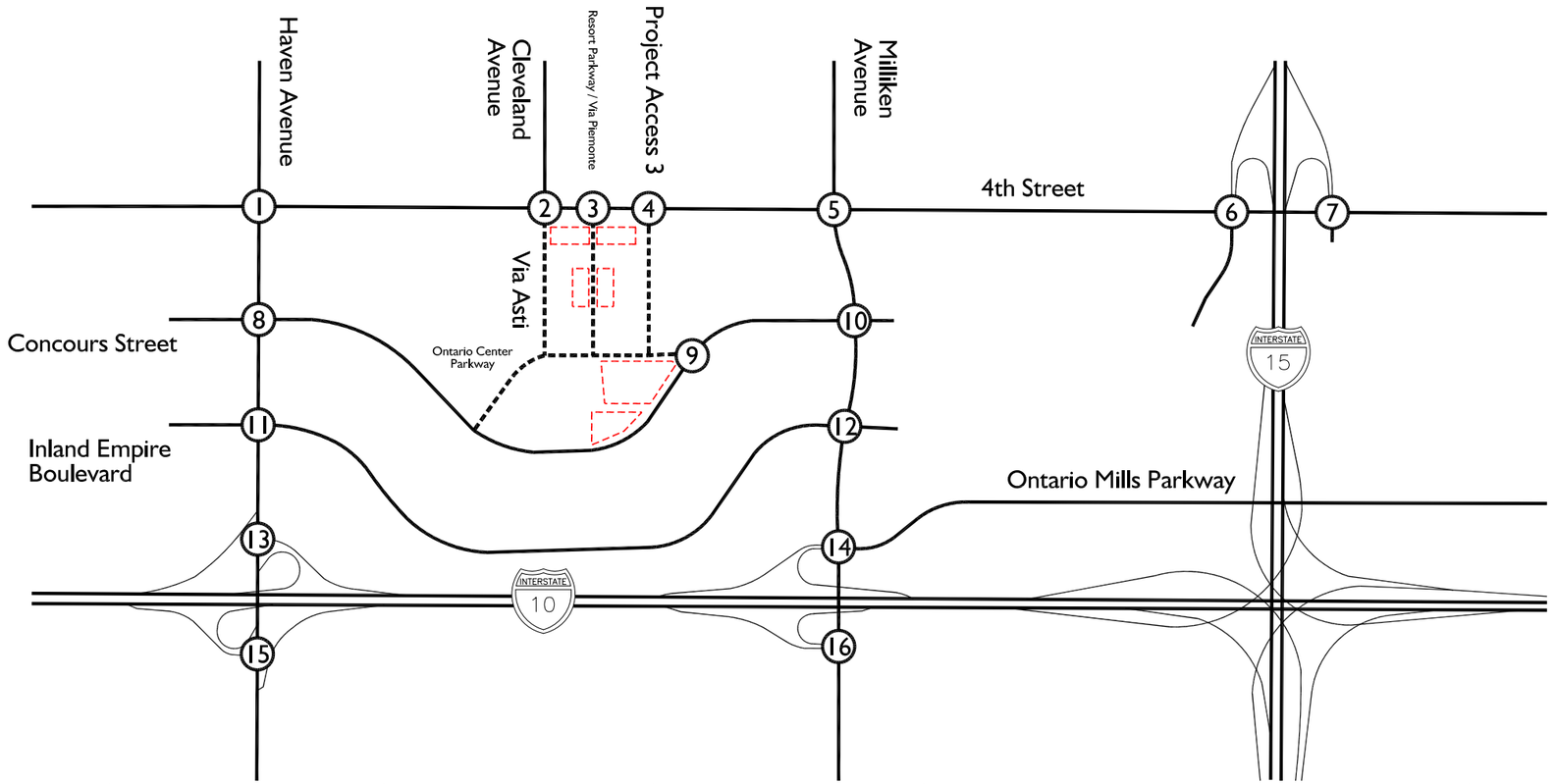
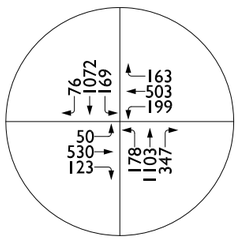
RK engineering group, inc.

Existing Conditions Traffic Volume - Weekday Saturday

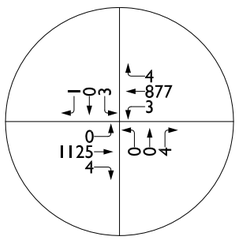


Legend:

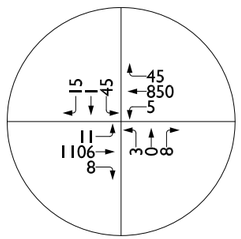
10 = Saturday Peak Hour Volumes



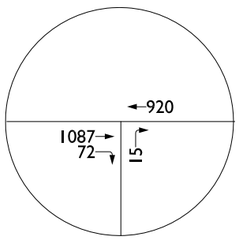
1. Haven Street (NS) & Fourth Street (EW)



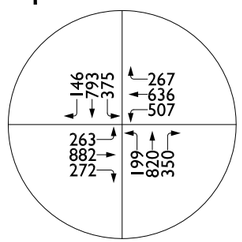
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)



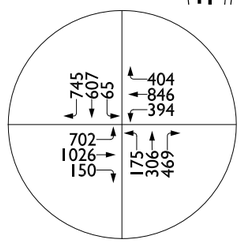
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)



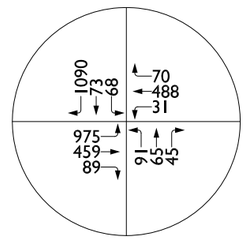
4. Project Street Access 3 (NS) & Fourth Street (EW)



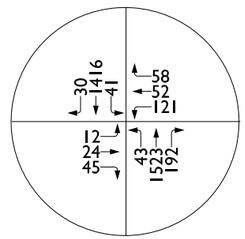
5. Milliken Avenue (NS) & Fourth Street (EW)



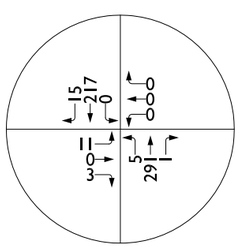
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)



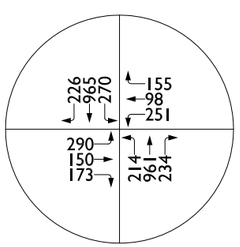
7. I-15 NB Ramps (NS) & Fourth Street (EW)



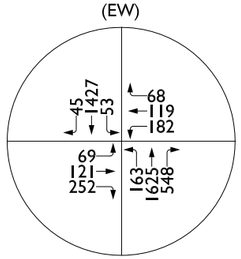
8. Haven Avenue (NS) & Concours Street (EW)



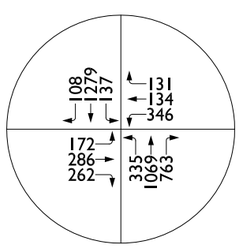
9. Concours Street (NS) & Ontario Center Parkway (EW)



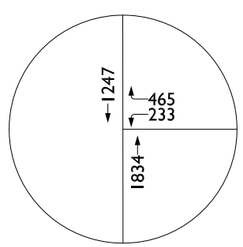
10. Milliken Street (NS) & Concours Street (EW)



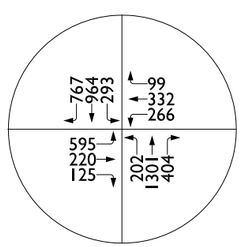
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)



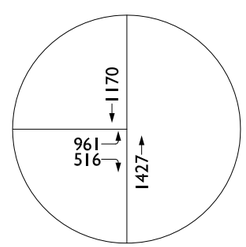
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)



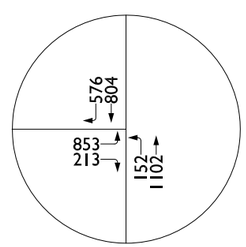
13. Haven Avenue (NS) & I-10 WB Ramps (EW)



14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)



15. Haven Avenue (NS) & I-10 EB Ramps (EW)

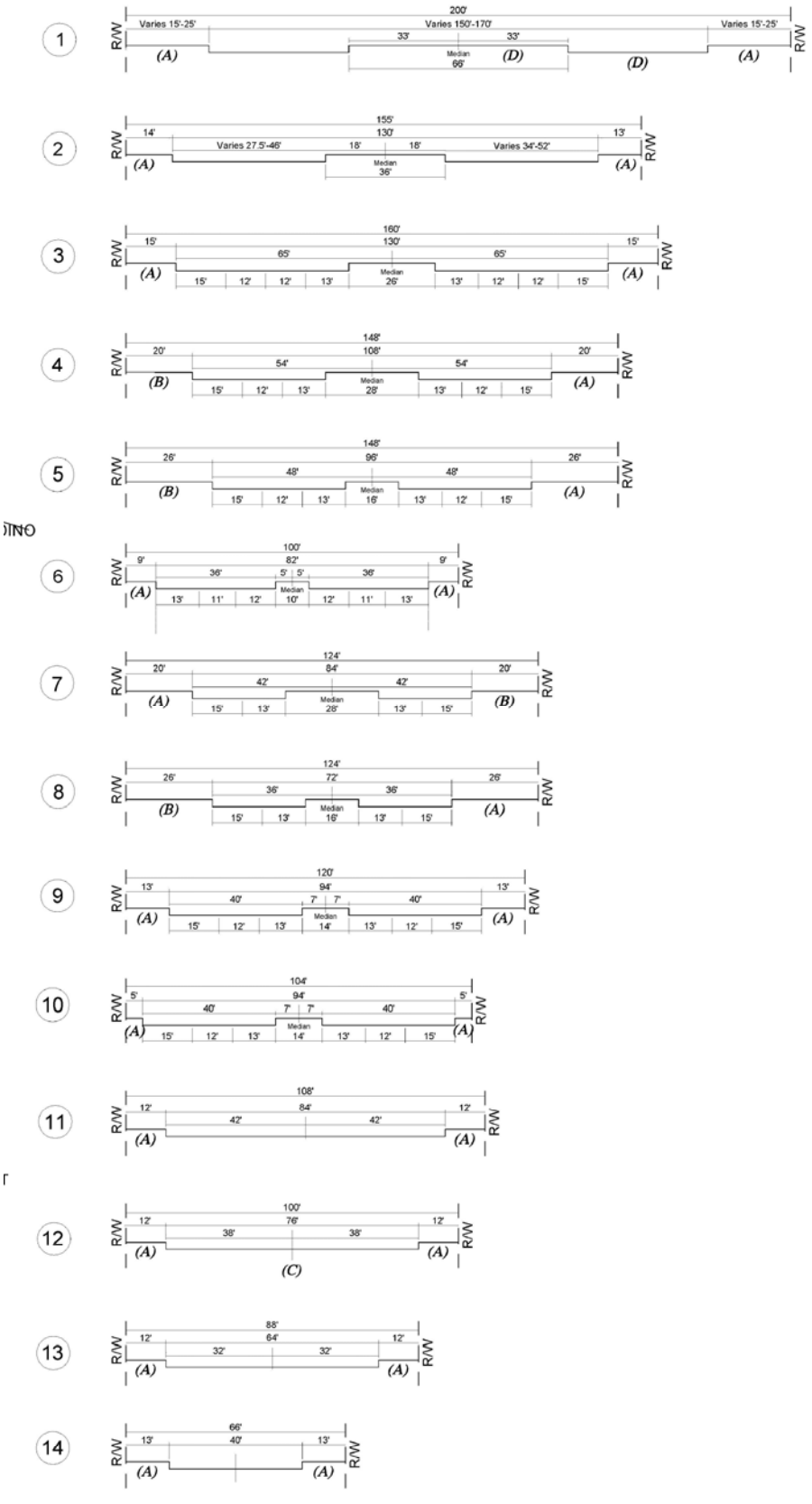


16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

N

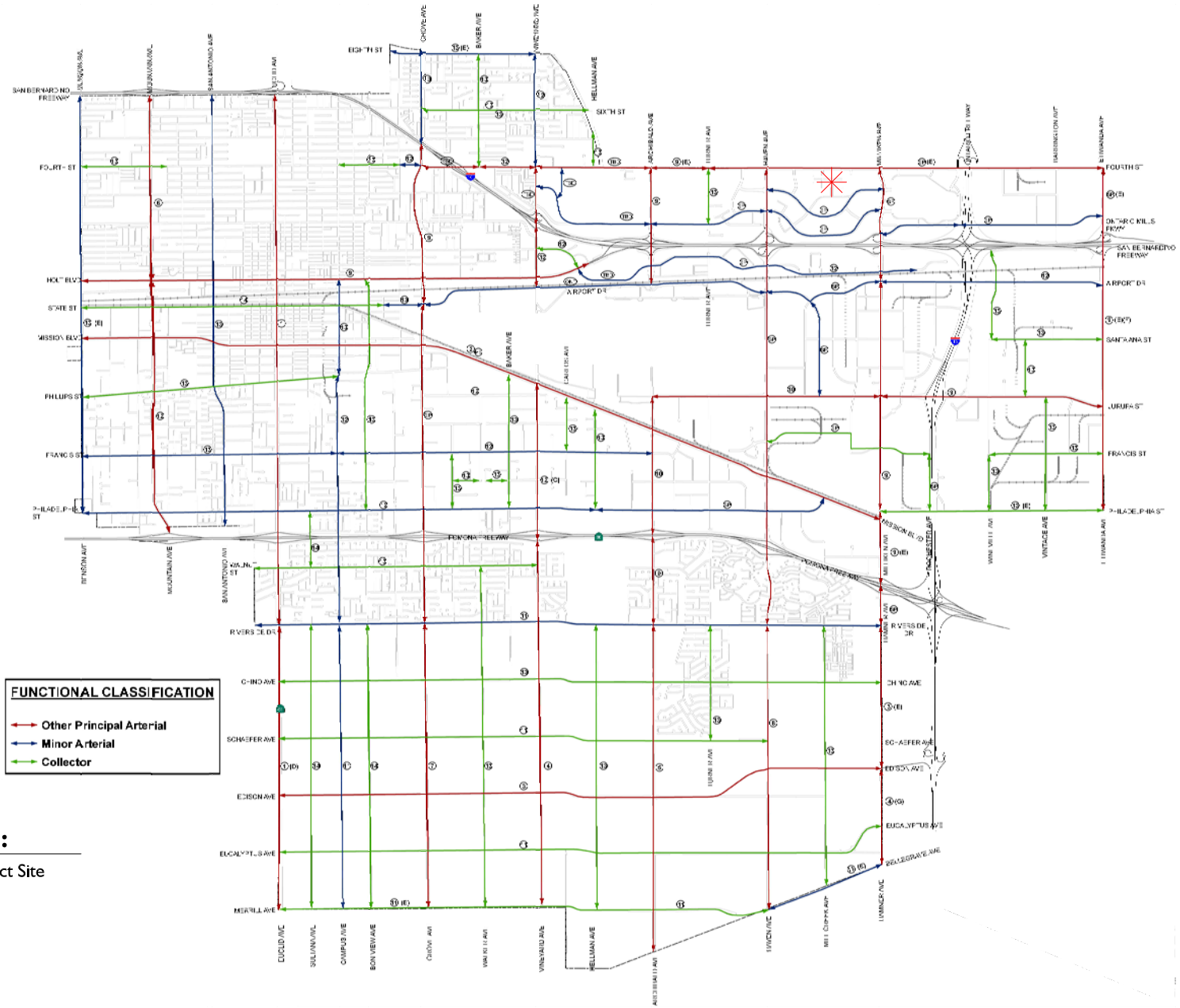
City of Ontario Typical Street Cross Sections

SECTIONS



N

City of Ontario Master Plan of Streets



City of Ontario Truck Routes

Legend:

✳ = Project Site

N

RK engineering group, inc.

4.0 Projected & Future Traffic Volumes

This section of the report provides a discussion on methodologies utilized to derive future traffic volumes for the study area.

4.1 Project Traffic Conditions

4.1.1 Trip Generation

Trip generation represents the amount of traffic that is attracted and produced by a development. The trip generation for the project is based upon the specific land uses that have been planned for this development.

Trip generation is typically estimated based on the trip generation rates from the latest *Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition, 2017)*. This publication provides a comprehensive evaluation of trip generation rates for a variety of land uses.

Table 4-1 shows the ITE trip generation rates for the trip generation analysis of the project land uses.

Utilizing the trip generation rates from Table 4-1, Table 4-2 summarizes the daily and peak hour trip generation for weekday and Saturday conditions for the proposed project.

As shown in Table 4-2, based on the ITE trip generation rates:

- The proposed project is forecast to generate approximately 6,447 weekday daily trips which include approximately 315 weekday AM peak hour trips, approximately 575 weekday PM peak hour trips.

- The proposed project is forecast to generate approximately 6,677 Saturday daily trips which include approximately 624 Saturday peak hour trips.

An internal trip capture reduction is applicable when a project site has more than one destination (such as the proposed project), in which a person visits more than one destination onsite during the same visit. The project site's retail component will

provide various land uses which will allow a patron to visit more than one destination on a single trip.

Furthermore, a portion of these trips (pass-by trips) are already on the roadway network making an intermediate stop on their way to a primary destination. Therefore, as also shown in Table 4-2, *after accounting for internal trip capture and applicable ITE pass-by trips rates*:

- The proposed project is forecast to generate approximately 5,691 weekday daily trips which include approximately 300 weekday AM peak hour trips, approximately 458 weekday PM peak hour trips.

- The proposed project is forecast to generate approximately 5,813 Saturday daily trips which include approximately 490 Saturday peak hour trips.

4.1.2 Trip Distribution

Trip distribution represents the directional orientation of traffic to and from the project site. Trip distribution is heavily influenced by the geographical location of the site and the proximity to the regional freeway system. The directional orientation of traffic was determined by evaluating existing and proposed land uses and highways within the study area.

The project outbound trip distribution is shown in Exhibit 4-1.

The project inbound trip distribution is shown in Exhibit 4-2.

4.1.3 Modal Split

Modal split denotes the proportion of traffic generated by a project that would use any of the transportation modes, namely buses, cars, bicycles, motorcycles, trains, carpools, etc. The traffic-reducing potential of public transit and other modes is significant. However, the traffic projections in this study are conservative in that public transit and alternative transportation may be able to reduce the traffic volumes, but, no modal split reduction is applied to the projections. With the implementation of transit service and provision of alternative transportation ideas and incentives, the automobile traffic demand can be reduced significantly.

4.1.4 Project Traffic Volumes/Assignment

The assignment of project traffic to the adjoining roadway system is based upon the project's trip generation, trip distribution, arterial highway, and local street systems that would be in place by the time of initial occupancy of the site.

Weekday project traffic volumes are shown in Exhibit 4-3. Saturday project traffic volumes are shown in Exhibit 4-4.

4.2 Existing Plus Project Conditions Traffic Volumes

Weekday Existing Plus Project Conditions traffic volumes consist of the summation of the weekday existing traffic volumes shown in Exhibit 3-2 and the weekday project traffic volumes shown in Exhibit 4-3.

Weekday Existing Plus Project Conditions traffic volumes are shown on Exhibit 4-5.

Saturday Existing Plus Project Conditions traffic volumes consist of the summation of the Saturday existing traffic volumes shown in Exhibit 3-3 and the Saturday project traffic volumes shown in Exhibit 4-4.

Saturday Existing Plus Project Conditions traffic volumes are shown on Exhibit 4-6.

4.3 Background Traffic

4.3.1 Method of Projection

To assess future conditions, project traffic is combined with existing traffic and area-wide growth. As directed by City staff, to account for area-wide/ambient growth in the study area, an annual growth rate of two percent (2%) per year has been applied to the existing (2021) traffic volumes over a 2-year period from 2021 to opening year (2023). Similarly, an annual growth rate of two percent (2%) per year has been applied to the existing (2021) traffic volumes over a 19-year period from 2021 to horizon year (2040).

4.3.2 Cumulative Projects Traffic

Information on future projects in the vicinity of the study area has been provided by City of Ontario and City of Rancho Cucamonga staff for inclusion in this analysis and is shown in Table 4-3.

The list of cumulative projects provided are for projects that have been officially submitted for land use review, are waiting public hearing approval, or have been approved by the public hearing body.

Table 4-3 shows the land uses, weekday and Saturday trip generation for the nearby cumulative projects provided by the public agencies.

A location map of the cumulative projects is shown in Exhibit 4-7.

Weekday cumulative projects traffic volumes are shown in Exhibit 4-8. Saturday cumulative projects traffic volumes are shown in Exhibit 4-9.

In reality, some of the cumulative projects may be downsized or may not be developed by project opening year (2023). In addition, many of the related projects have been or will be subject to a variety of mitigation measures that will reduce the potential environmental impacts associated with those projects. However, those mitigation measures have not been taken into account in projecting the environmental impact of the related projects.

Therefore, the cumulative analyses set forth below are conservative and could result in greater impacts than actually anticipated. Additionally, the analysis utilizes a growth rate of two percent (2%) per year for project opening year (2023) conditions, which would already capture and account for most projects in the area. The growth rate methodology is considered conservative since it is applied to all movements in all the study intersections.

4.4 Opening Year Without Related Projects Without Project Conditions Traffic Volumes

Opening Year Without Related Projects Without Project Conditions traffic volumes consist of two (2) years of annual growth on top of existing (2021) traffic volumes at two percent (2%) per year.

Weekday Opening Year Without Related Projects Without Project Conditions traffic volumes are shown on Exhibit 4-10.

Saturday Opening Year Without Related Projects Without Project Conditions traffic volumes are shown on Exhibit 4-11.

4.5 Opening Year Without Related Projects With Project Conditions Traffic Volumes

Opening Year Without Related Projects With Project Conditions traffic volumes consist of two (2) years of annual growth on top of existing (2021) traffic volumes at two percent (2%) per year, plus the traffic generated by the proposed project.

Weekday Opening Year Without Related Projects With Project Conditions traffic volumes are shown on Exhibit 4-12.

Saturday Opening Year Without Related Projects With Project Conditions traffic volumes are shown on Exhibit 4-13.

4.6 Opening Year With Related Projects Without Project Conditions Traffic Volumes

Opening Year With Related Projects Without Project Conditions traffic volumes consist of two (2) years of annual growth on top of existing (2021) traffic volumes at two percent (2%) per year, plus the traffic generated by the cumulative projects.

Weekday Opening Year With Related Projects Without Project Conditions traffic volumes are shown on Exhibit 4-14.

Saturday Opening Year With Related Projects Without Project Conditions traffic volumes are shown on Exhibit 4-15.

4.7 Opening Year With Related Projects With Project Conditions Traffic Volumes

Weekday Opening Year With Related Projects With Project Conditions traffic volumes consist of two (2) years of annual growth on top of existing (2021) traffic volumes at two

percent (2%) per year, plus the traffic generated by the cumulative projects and proposed project.

Weekday Opening Year With Related Projects With Project Conditions traffic volumes are shown on Exhibit 4-16.

Saturday Opening Year With Related Projects With Project Conditions traffic volumes are shown on Exhibit 4-17.

4.8 Horizon Year (2040) Without Project Conditions Traffic Volumes

Horizon Year (2040) Without Project Conditions traffic volumes consist of nineteen (19) years of annual growth on top of existing (2021) traffic volumes at two percent (2%) per year.

Weekday Horizon Year (2040) Without Project Conditions traffic volumes are shown on Exhibit 4-18.

Saturday Horizon Year (2040) Without Project Conditions traffic volumes are shown on Exhibit 4-19.

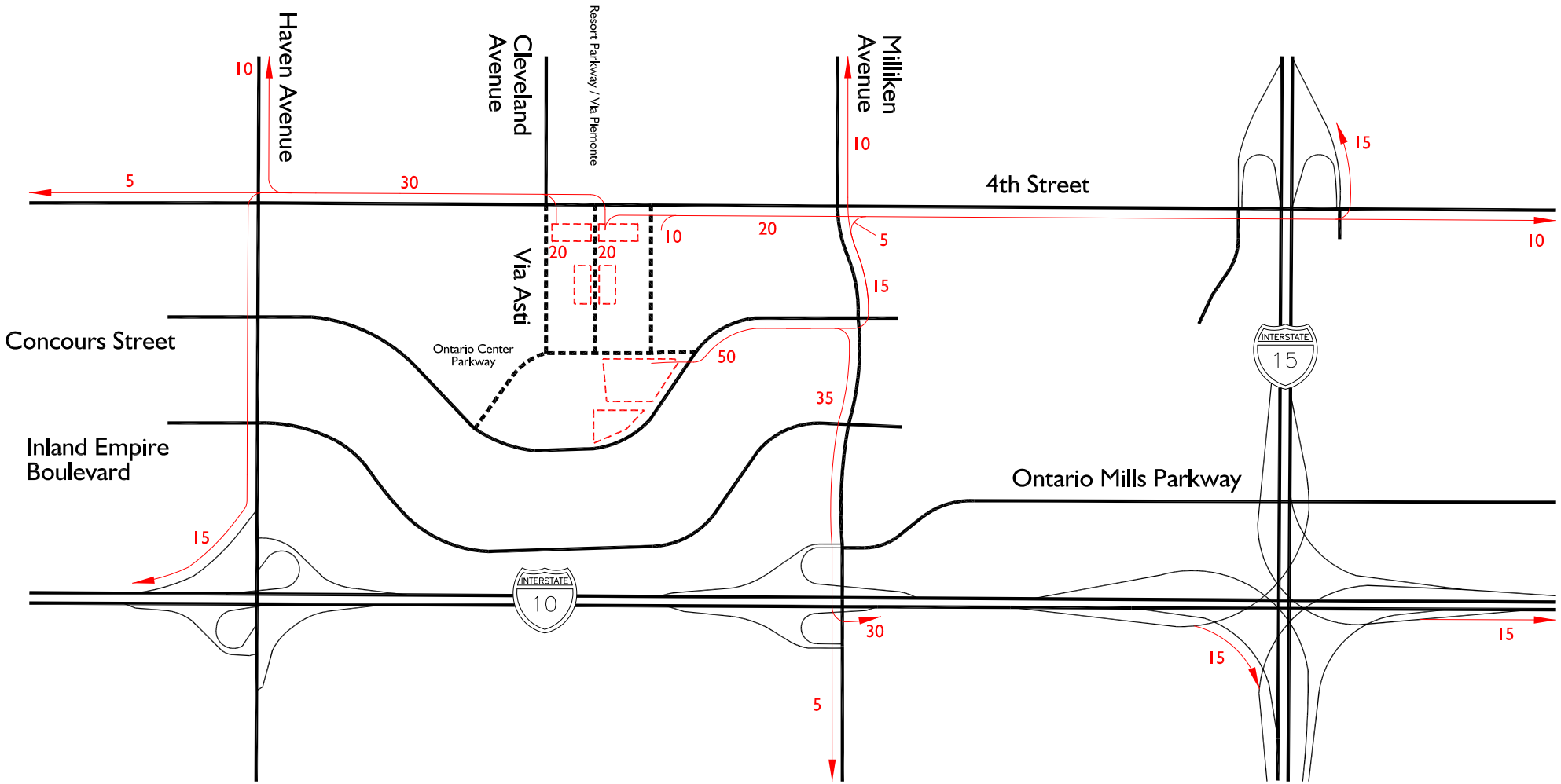
4.9 Horizon Year (2040) With Project Conditions Traffic Volumes

Horizon Year (2040) With Project Conditions traffic volumes are derived by adding the project-generated traffic to Horizon Year (2040) Without Project Conditions traffic volumes.

Weekday Horizon Year (2040) With Project Conditions traffic volumes are shown on Exhibit 4-20.

Saturday Horizon Year (2040) With Project Conditions traffic volumes are shown on Exhibit 4-21.

Outbound Project Trip Distribution

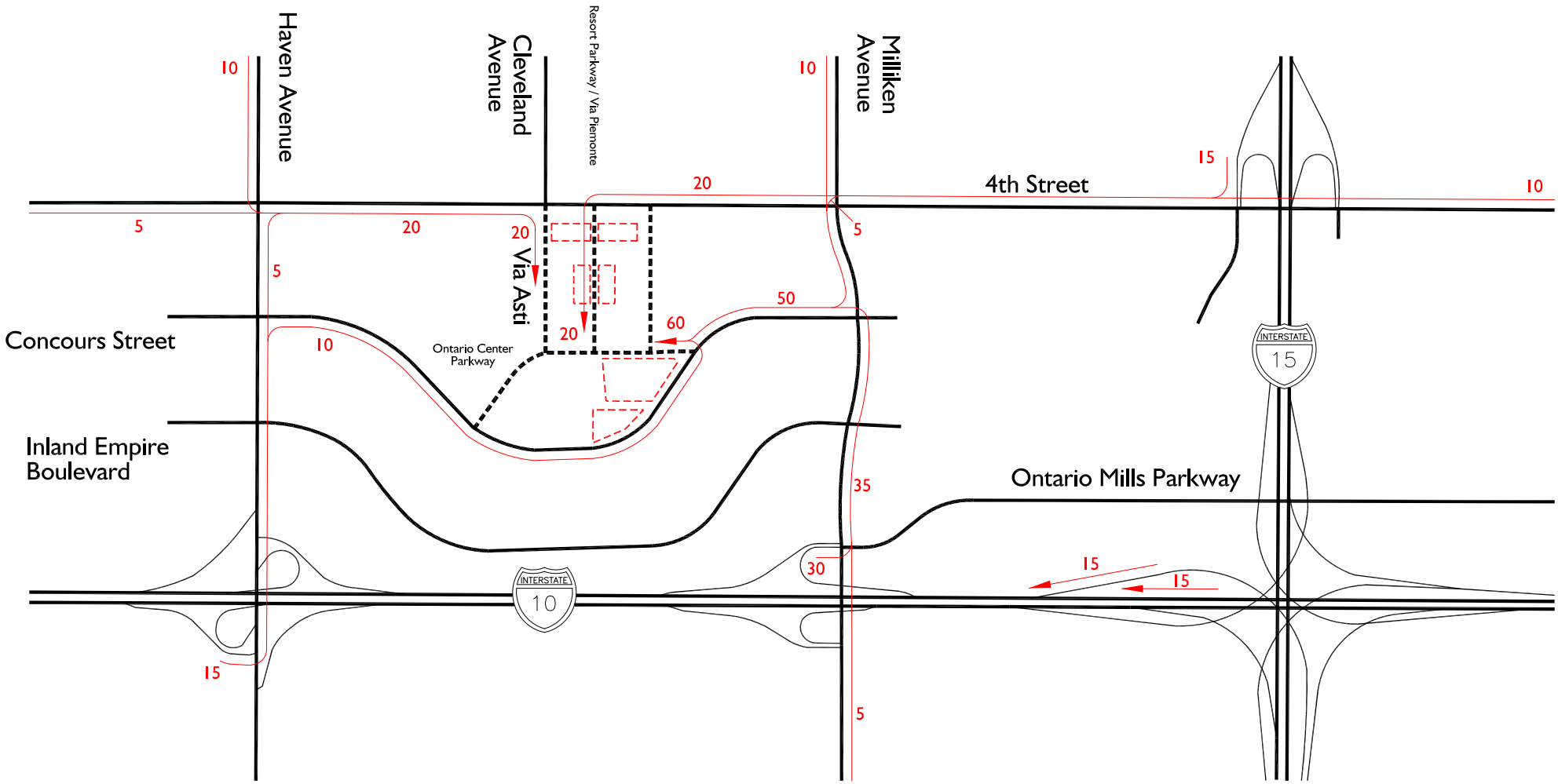


Legend:

10 = Percent from Project

N

Inbound Project Trip Distribution

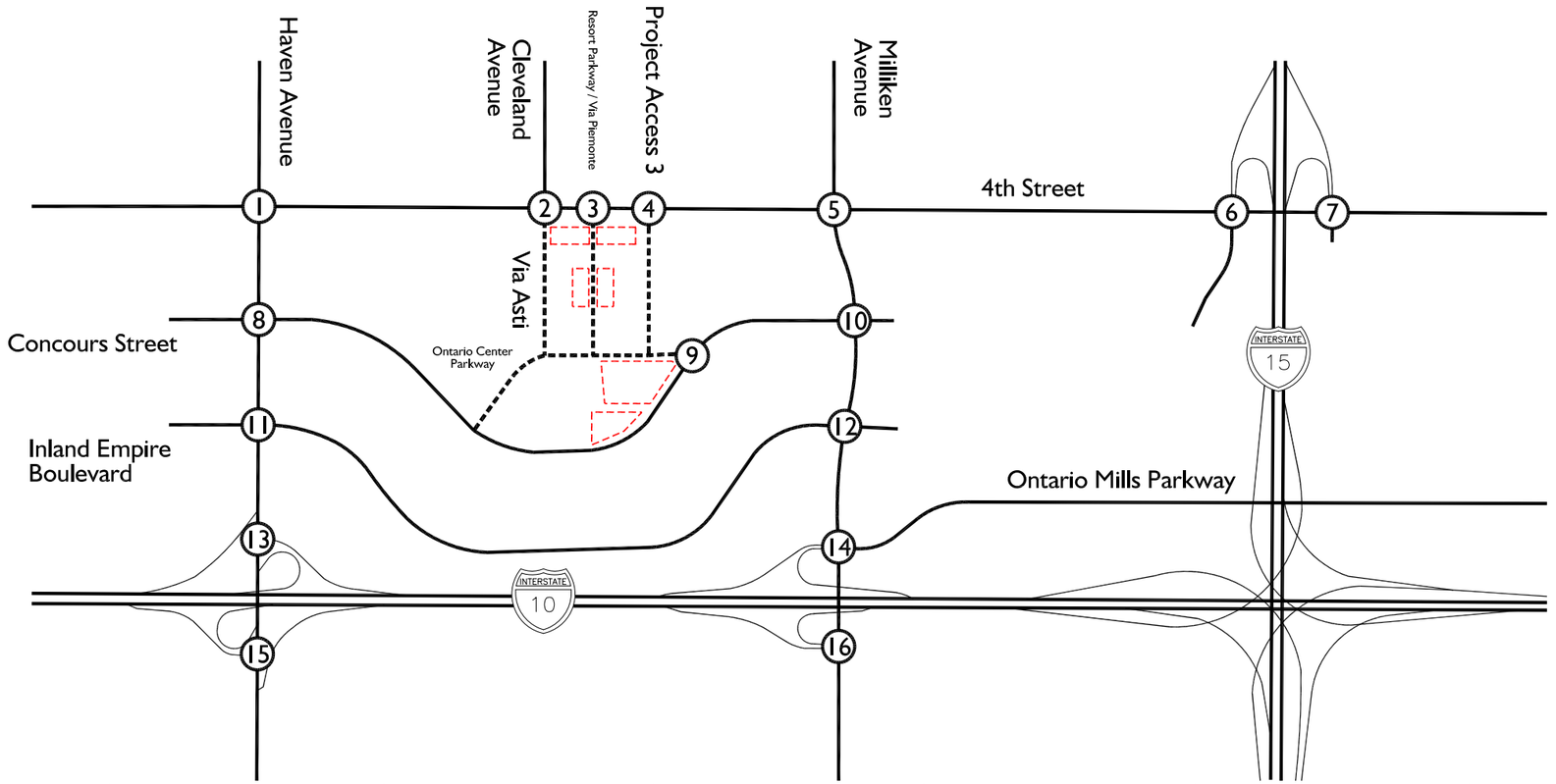


Legend:

10 = Percent to Project

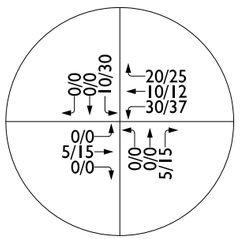
N

Project Traffic Volumes - Weekday

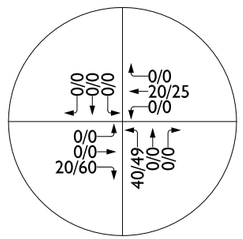


Legend:

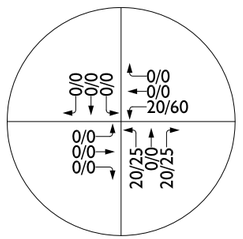
10/20 = AM/PM Peak Hour Volumes



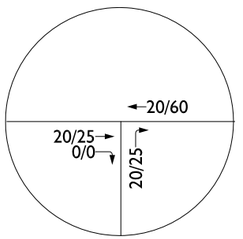
1. Haven Street (NS) & Fourth Street (EW)



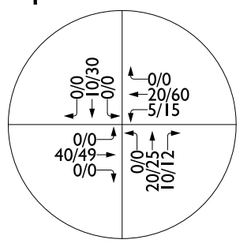
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)



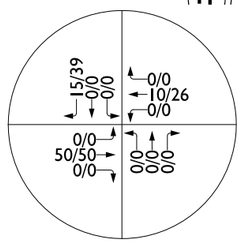
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)



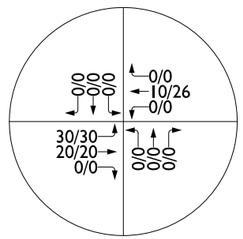
4. Project Street Access 3 (NS) & Fourth Street (EW)



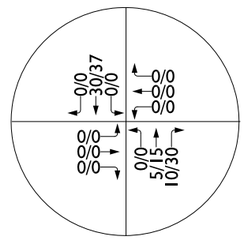
5. Milliken Avenue (NS) & Fourth Street (EW)



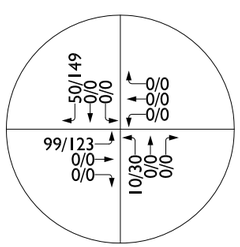
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)



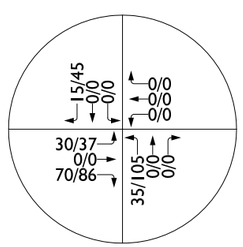
7. I-15 NB Ramps (NS) & Fourth Street (EW)



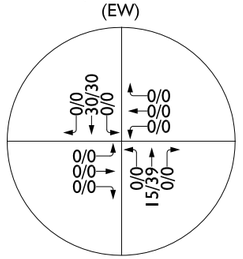
8. Haven Avenue (NS) & Concours Street (EW)



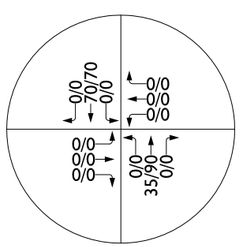
9. Concours Street (NS) & Ontario Center Parkway (EW)



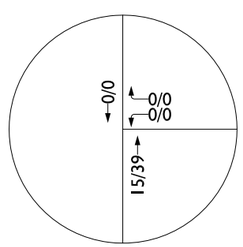
10. Milliken Street (NS) & Concours Street (EW)



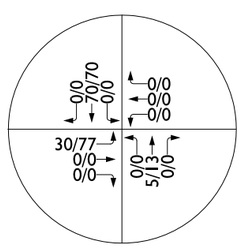
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)



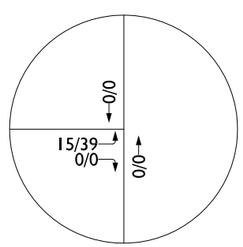
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)



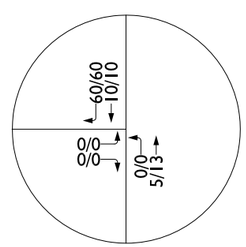
13. Haven Avenue (NS) & I-10 WB Ramps (EW)



14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)



15. Haven Avenue (NS) & I-10 EB Ramps (EW)

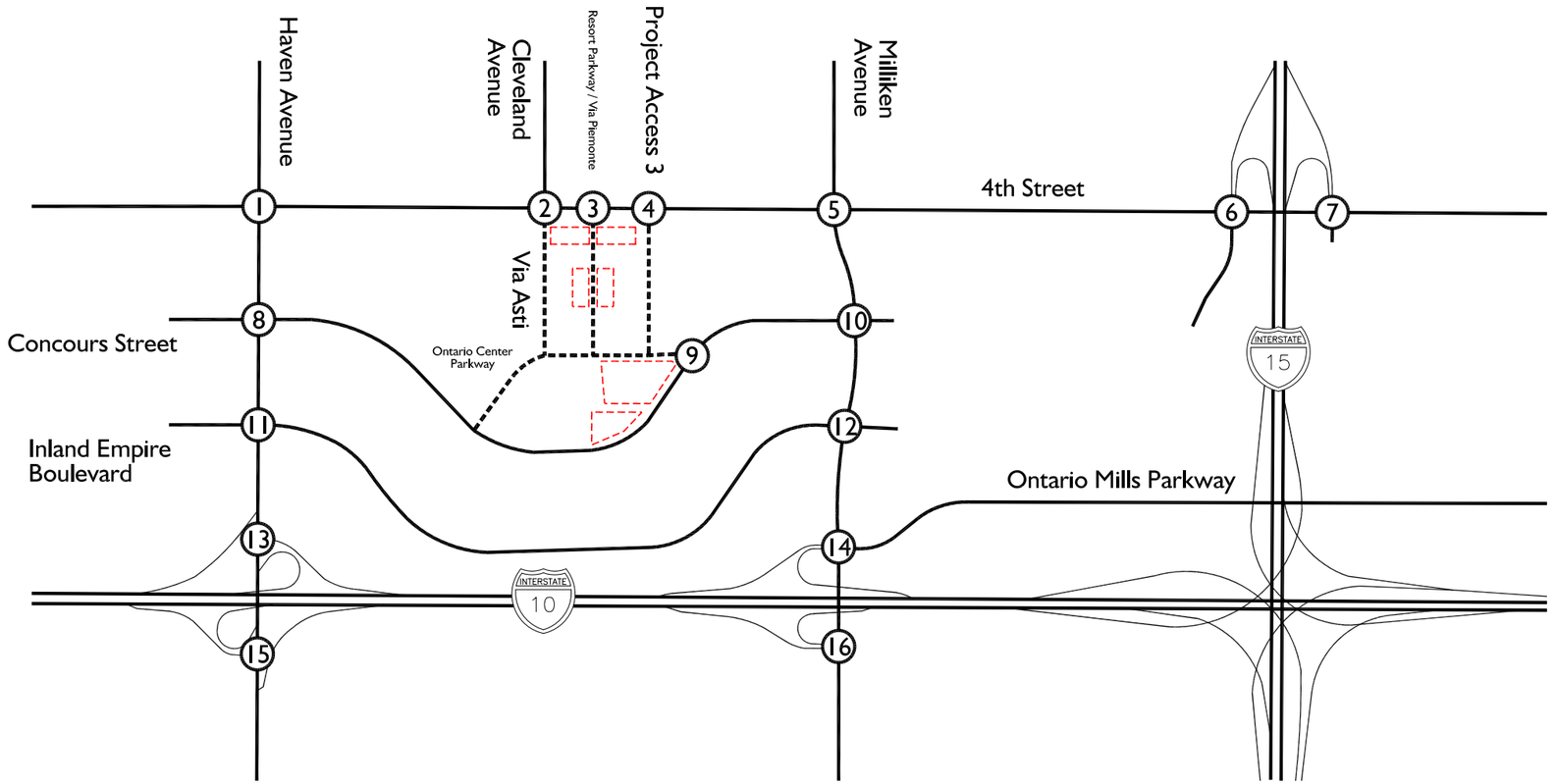


16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

N

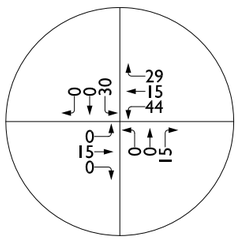
Exhibit 4-4

Project Traffic Volumes - Saturday

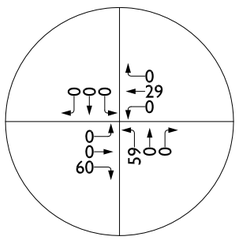


Legend:

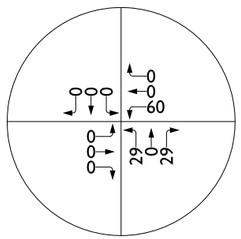
10 = Saturday Peak Hour Volumes



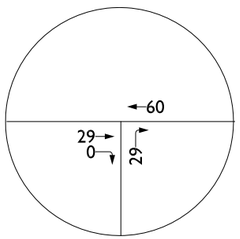
1. Haven Street (NS) & Fourth Street (EW)



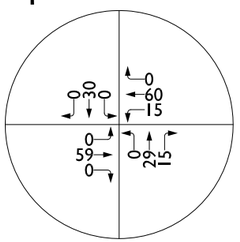
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)



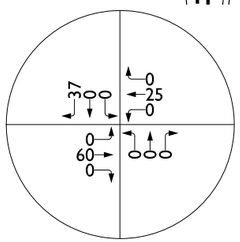
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)



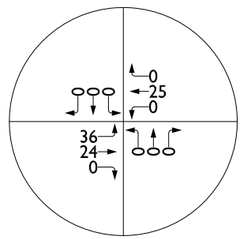
4. Project Street Access 3 (NS) & Fourth Street (EW)



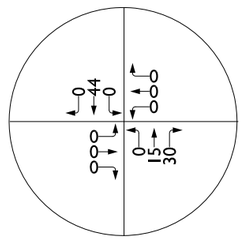
5. Milliken Avenue (NS) & Fourth Street (EW)



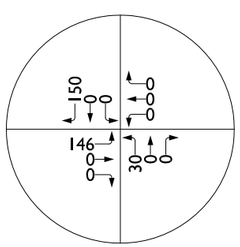
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)



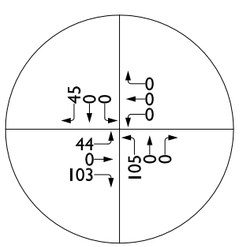
7. I-15 NB Ramps (NS) & Fourth Street (EW)



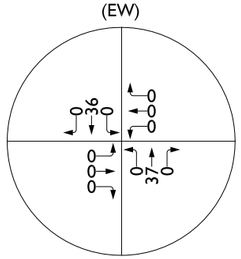
8. Haven Avenue (NS) & Concours Street (EW)



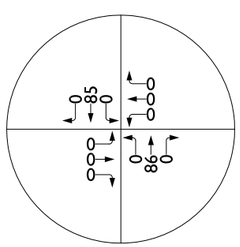
9. Concours Street (NS) & Ontario Center Parkway (EW)



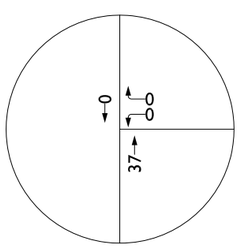
10. Milliken Street (NS) & Concours Street (EW)



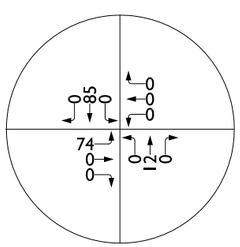
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)



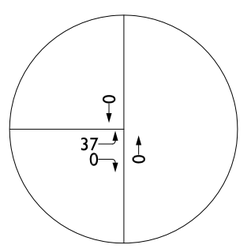
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)



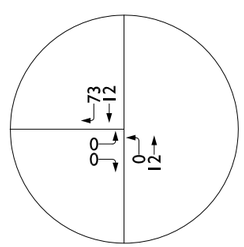
13. Haven Avenue (NS) & I-10 WB Ramps (EW)



14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)



15. Haven Avenue (NS) & I-10 EB Ramps (EW)

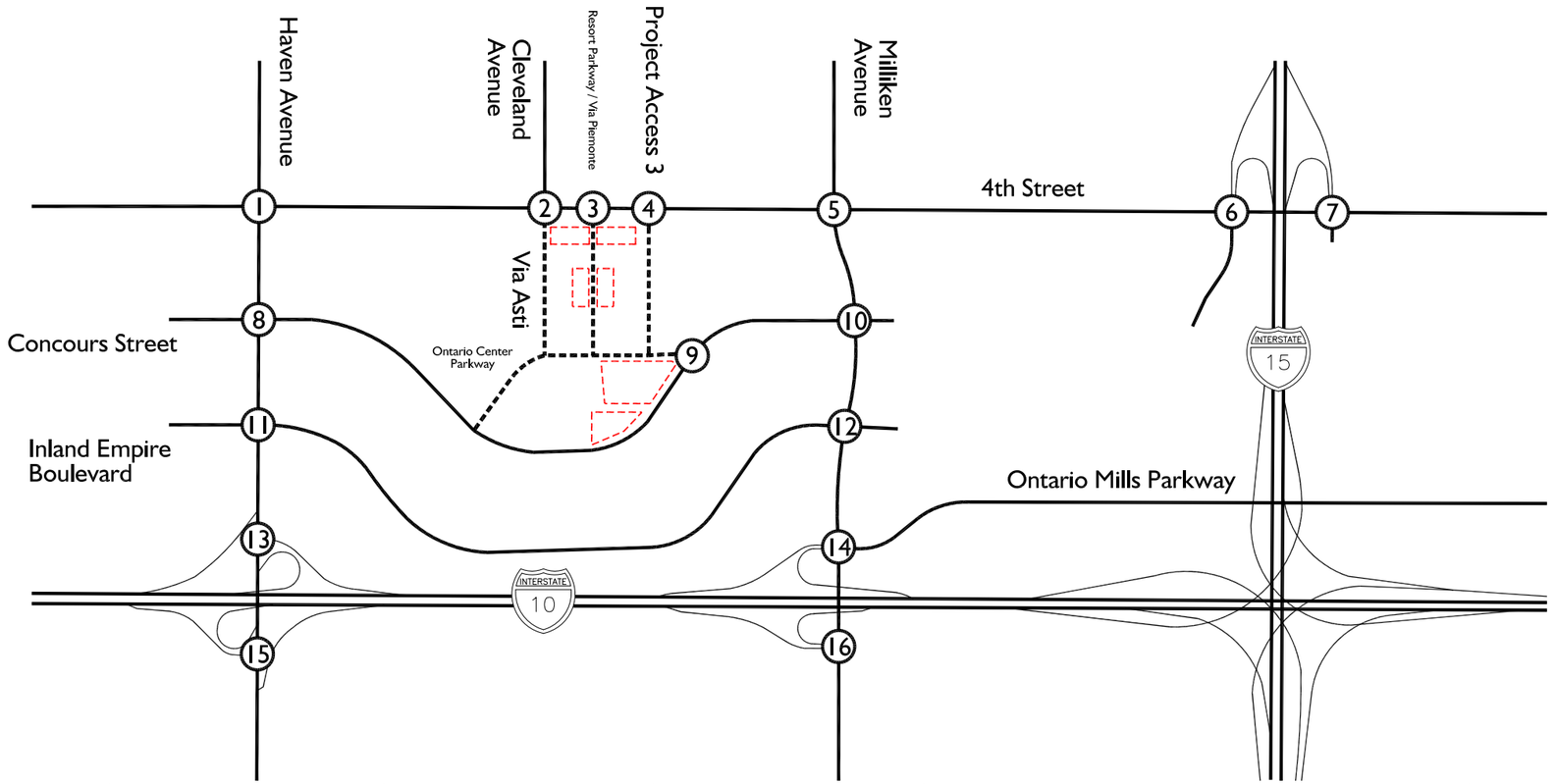


16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

N

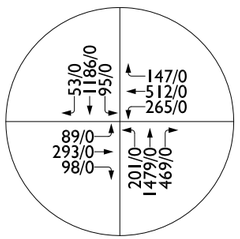
RK engineering group, inc.

Existing Plus Project Conditions Traffic Volumes - Weekday

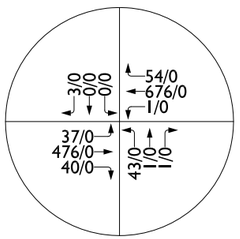


Legend:

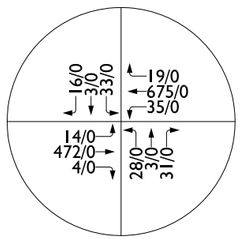
10/20 = AM/PM Peak Hour Volumes



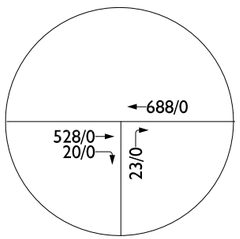
1. Haven Street (NS) & Fourth Street (EW)



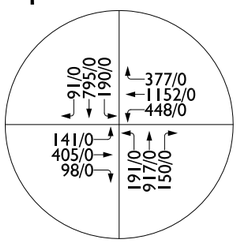
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)



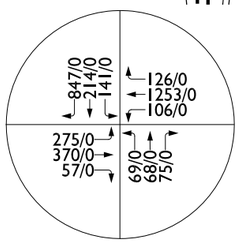
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)



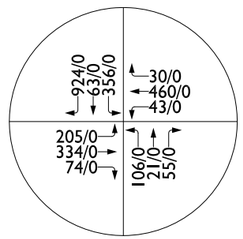
4. Project Street Access 3 (NS) & Fourth Street (EW)



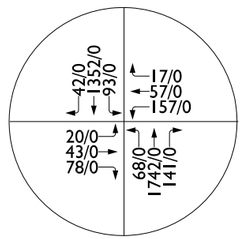
5. Milliken Avenue (NS) & Fourth Street (EW)



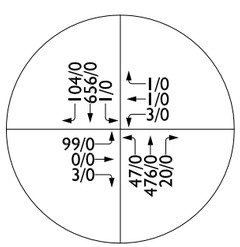
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)



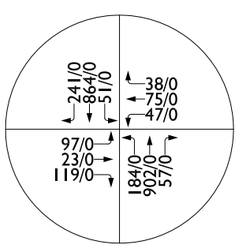
7. I-15 NB Ramps (NS) & Fourth Street (EW)



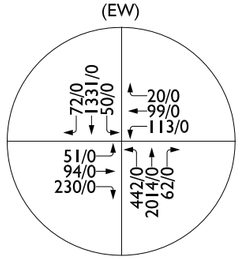
8. Haven Avenue (NS) & Concours Street (EW)



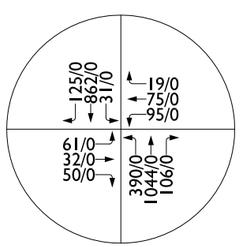
9. Concours Street (NS) & Ontario Center Parkway (EW)



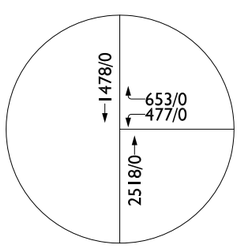
10. Milliken Street (NS) & Concours Street (EW)



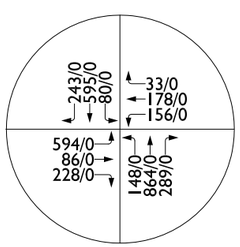
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)



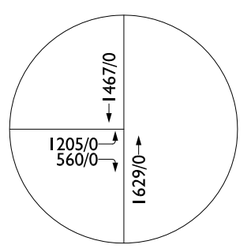
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)



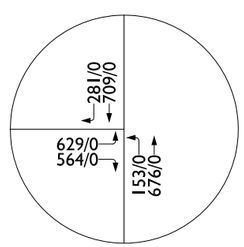
13. Haven Avenue (NS) & I-10 WB Ramps (EW)



14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)



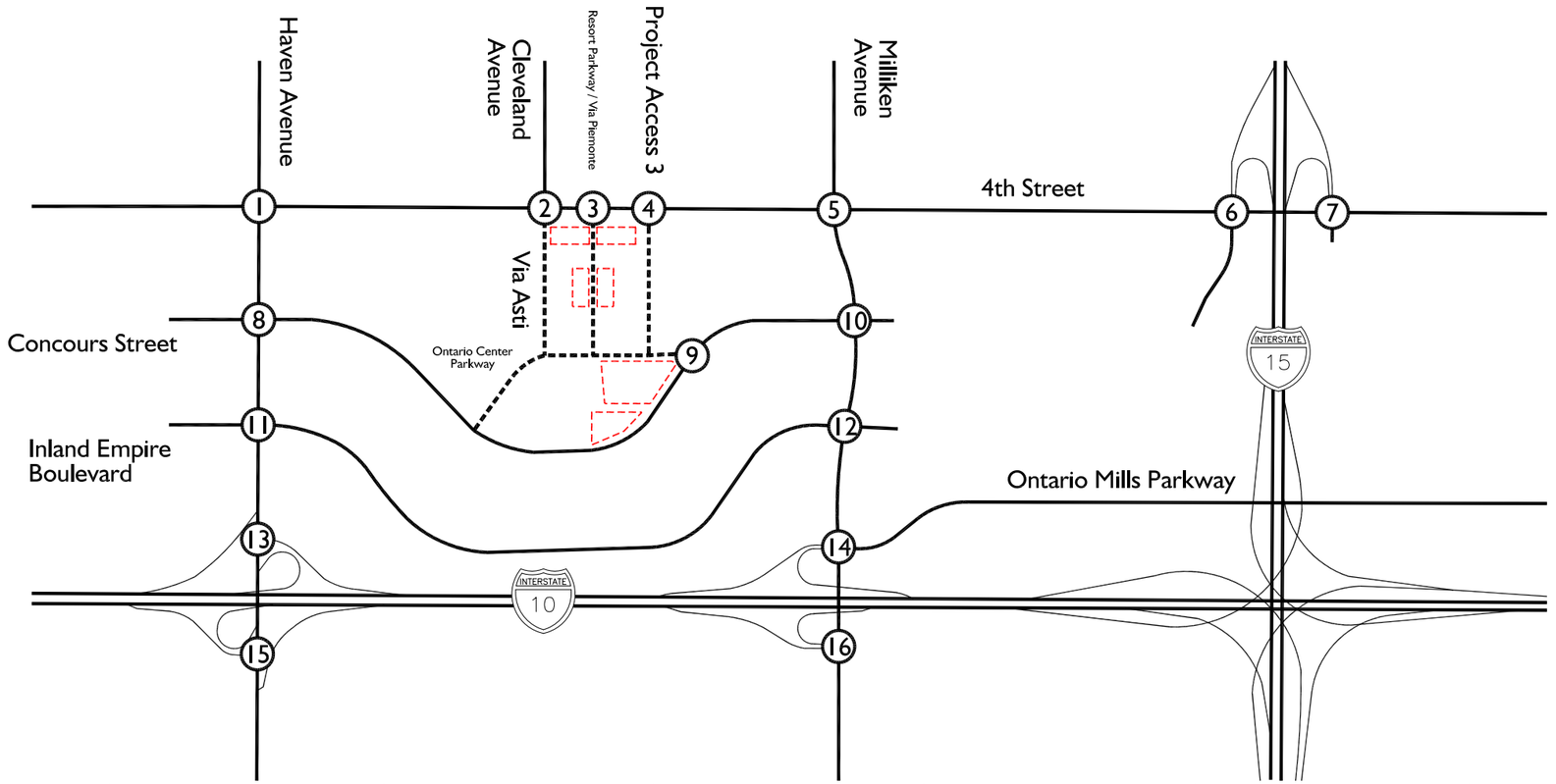
15. Haven Avenue (NS) & I-10 EB Ramps (EW)



16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

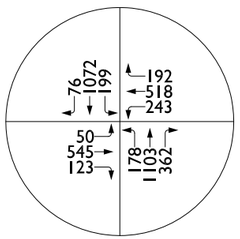
N

Existing Plus Project Conditions Traffic Volumes - Saturday

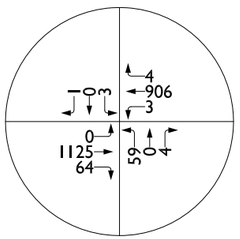


Legend:

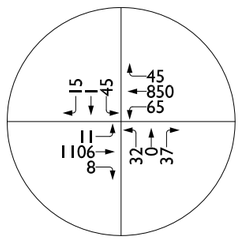
10 = Saturday Peak Hour Volumes



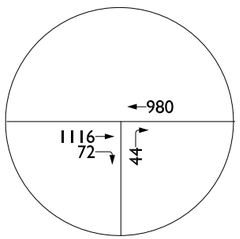
1. Haven Street (NS) & Fourth Street (EW)



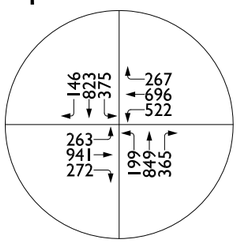
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)



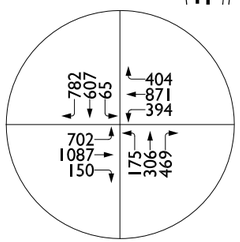
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)



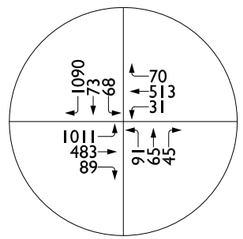
4. Project Street Access 3 (NS) & Fourth Street (EW)



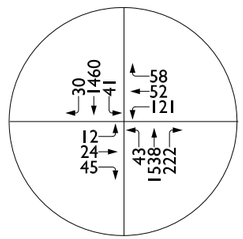
5. Milliken Avenue (NS) & Fourth Street (EW)



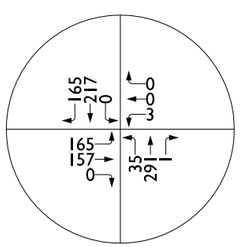
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)



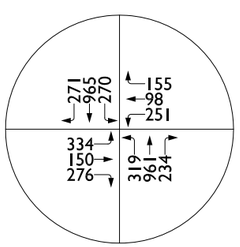
7. I-15 NB Ramps (NS) & Fourth Street (EW)



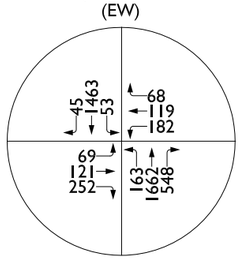
8. Haven Avenue (NS) & Concours Street (EW)



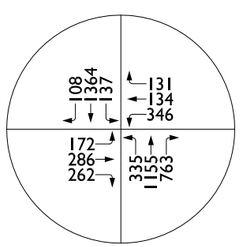
9. Concours Street (NS) & Ontario Center Parkway (EW)



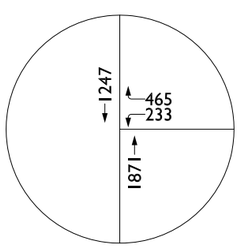
10. Milliken Street (NS) & Concours Street (EW)



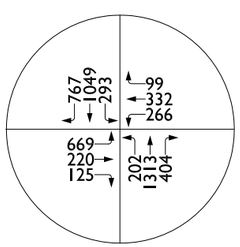
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)



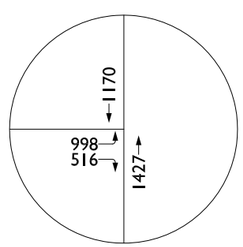
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)



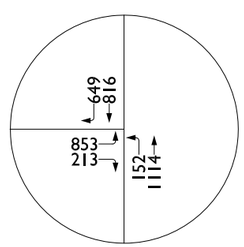
13. Haven Avenue (NS) & I-10 WB Ramps (EW)



14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)



15. Haven Avenue (NS) & I-10 EB Ramps (EW)

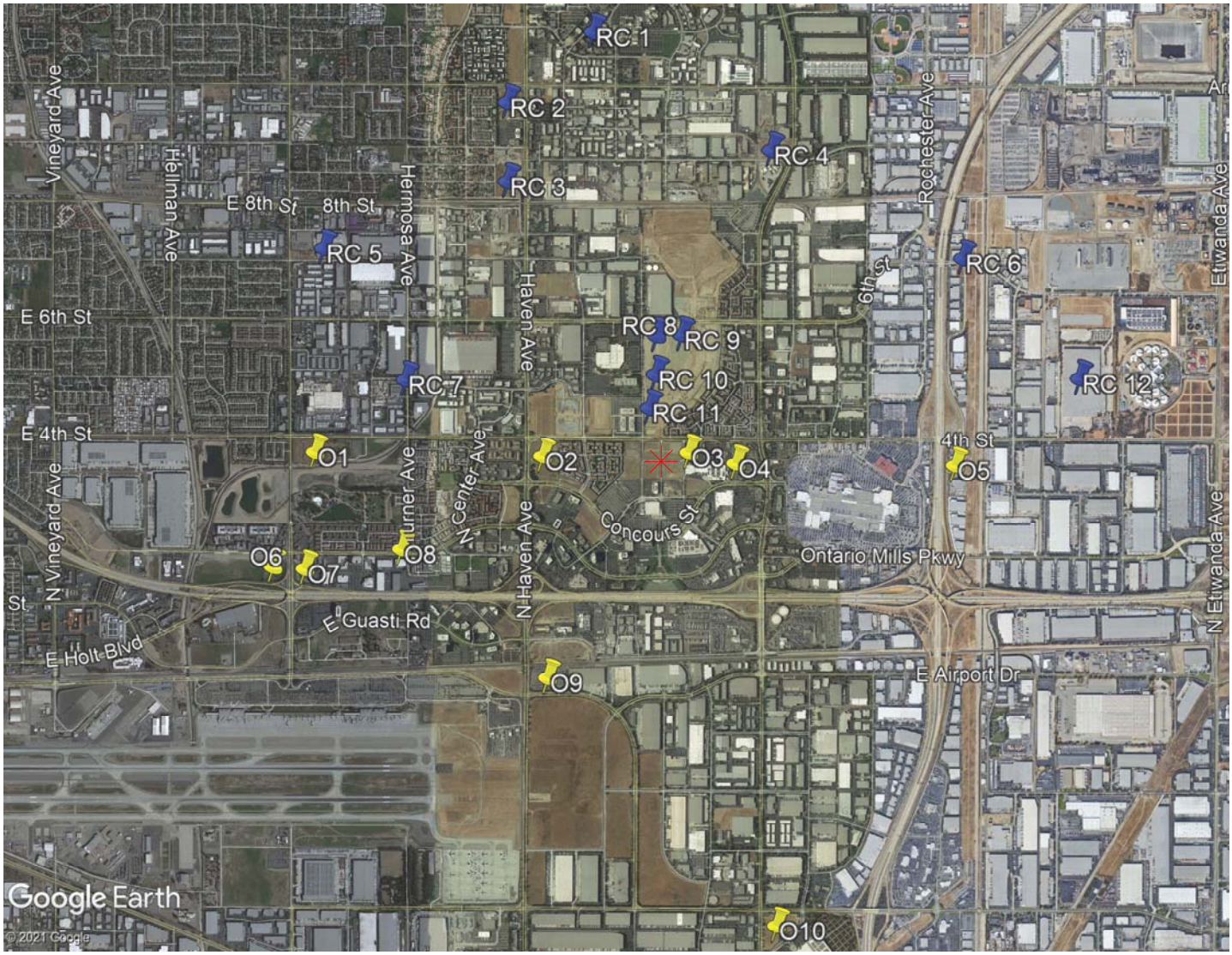


16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

N

Exhibit 4-7

Cumulative Projects Location Map



NOTE: See report for full list of cumulative projects and traffic analysis zones (TAZ).

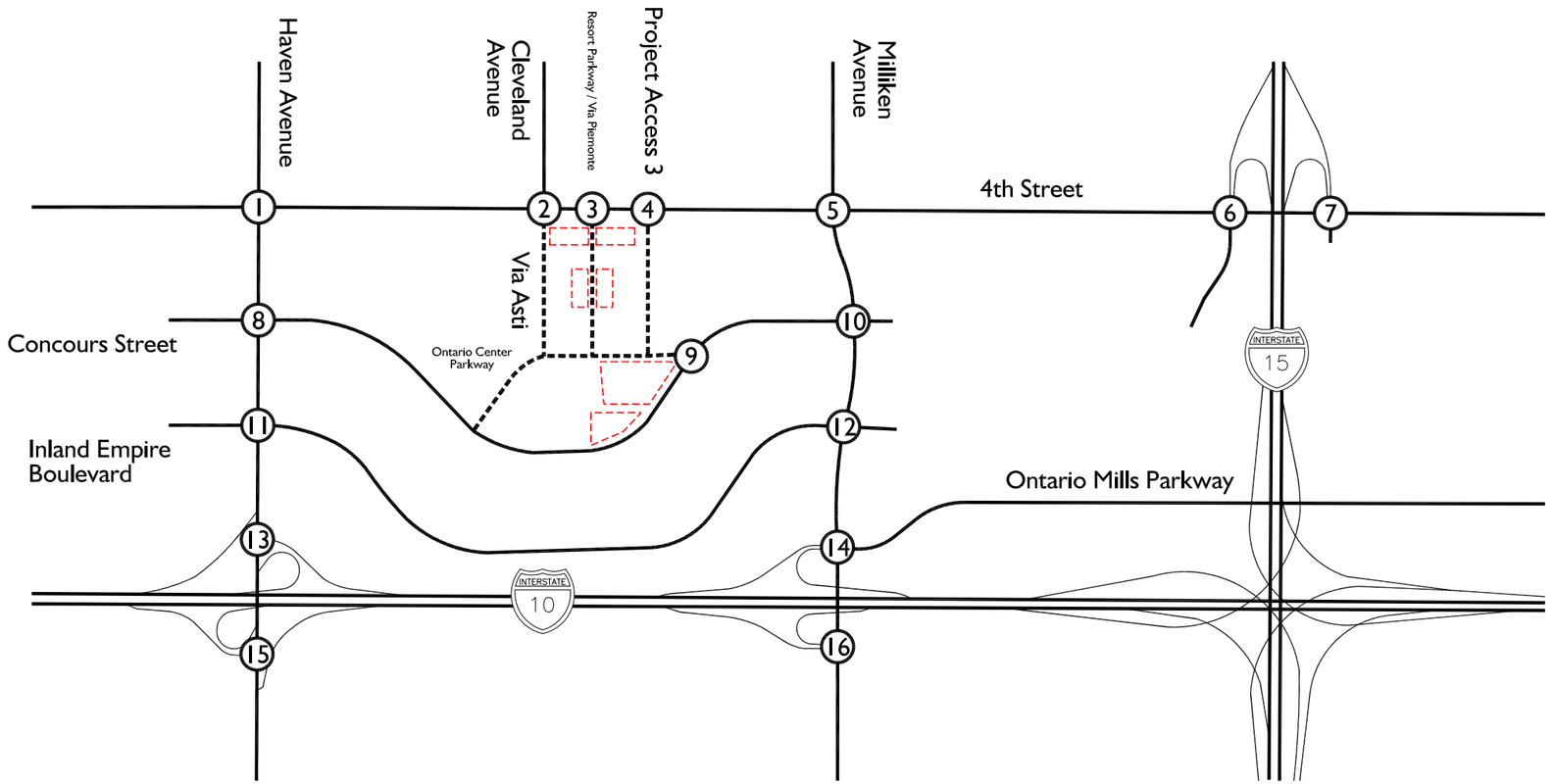
Legend:

= City of Rancho Cucamonga Cumulative Project

= City of Ontario Cumulative Project

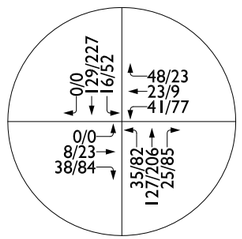
N

Cumulative Projects Traffic Volumes - Weekday

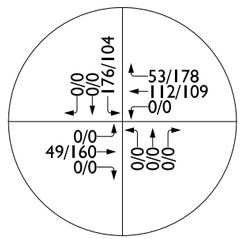


Legend:

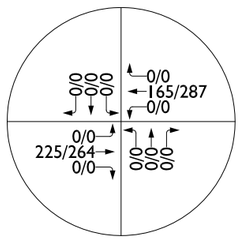
10/20 = AM/PM Peak Hour Volumes



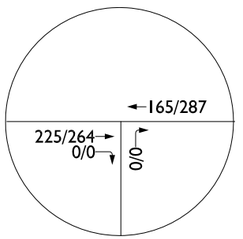
1. Haven Street (NS) & Fourth Street (EW)



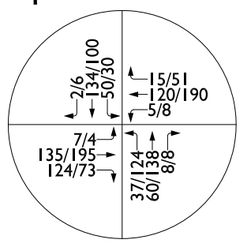
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)



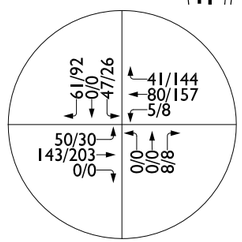
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)



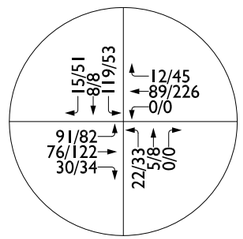
4. Project Street Access 3 (NS) & Fourth Street (EW)



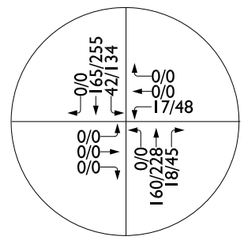
5. Milliken Avenue (NS) & Fourth Street (EW)



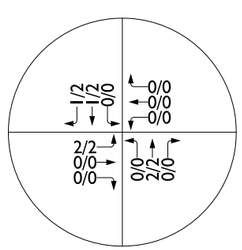
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)



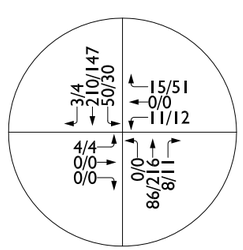
7. I-15 NB Ramps (NS) & Fourth Street (EW)



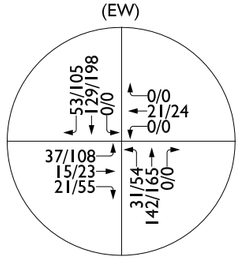
8. Haven Avenue (NS) & Concours Street (EW)



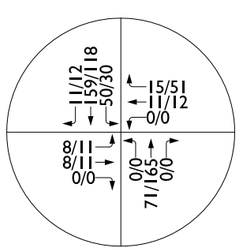
9. Concours Street (NS) & Ontario Center Parkway (EW)



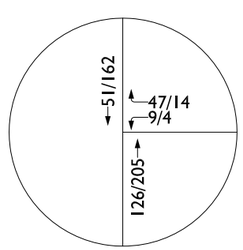
10. Milliken Street (NS) & Concours Street (EW)



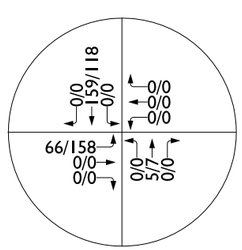
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)



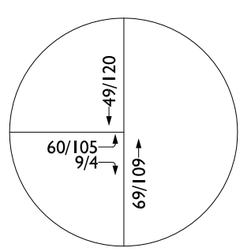
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)



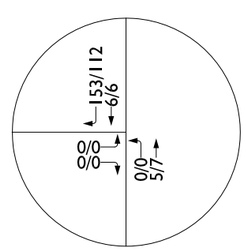
13. Haven Avenue (NS) & I-10 WB Ramps (EW)



14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)



15. Haven Avenue (NS) & I-10 EB Ramps (EW)

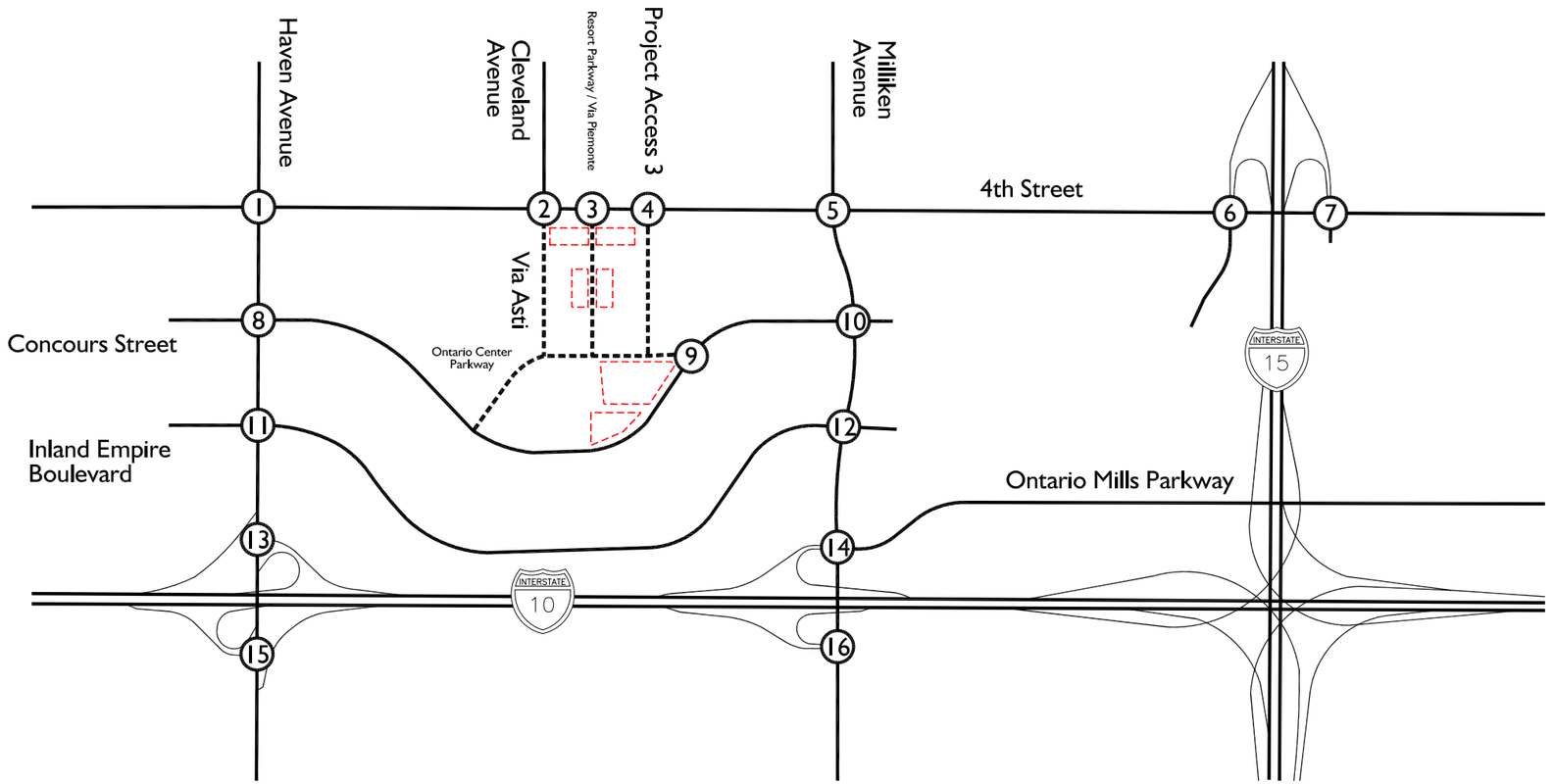


16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

N

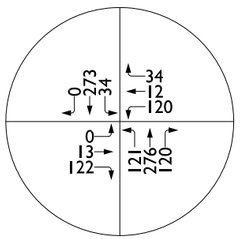
Exhibit 4-9

Cumulative Projects Traffic Volumes - Saturday

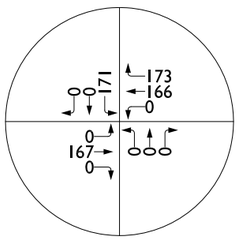


Legend:

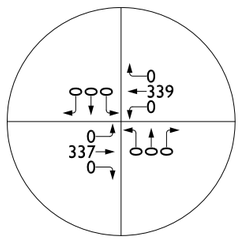
10 = Saturday Peak Hour Volumes



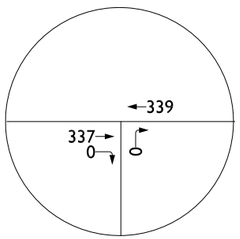
1. Haven Street (NS) & Fourth Street (EW)



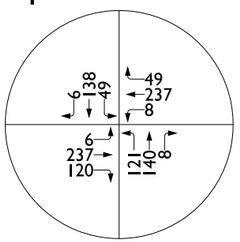
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)



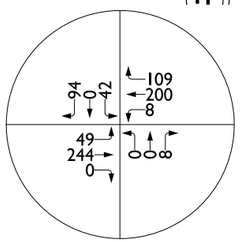
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)



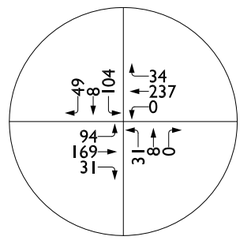
4. Project Street Access 3 (NS) & Fourth Street (EW)



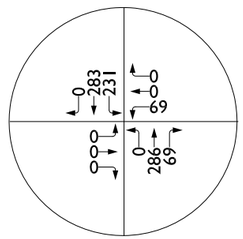
5. Milliken Avenue (NS) & Fourth Street (EW)



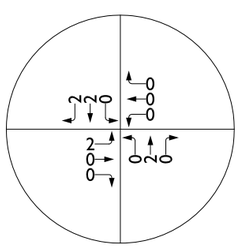
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)



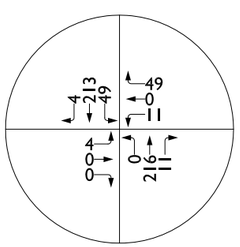
7. I-15 NB Ramps (NS) & Fourth Street (EW)



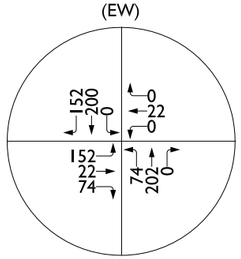
8. Haven Avenue (NS) & Concours Street (EW)



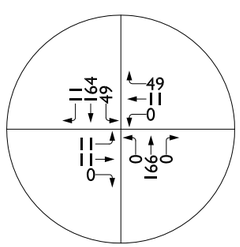
9. Concours Street (NS) & Ontario Center Parkway (EW)



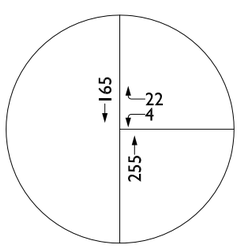
10. Milliken Street (NS) & Concours Street (EW)



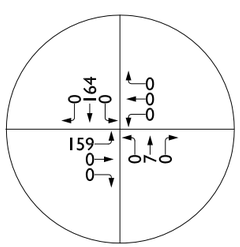
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)



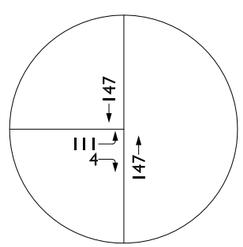
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)



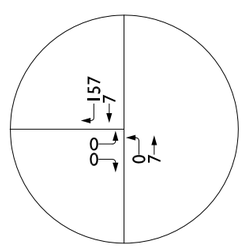
13. Haven Avenue (NS) & I-10 WB Ramps (EW)



14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)



15. Haven Avenue (NS) & I-10 EB Ramps (EW)

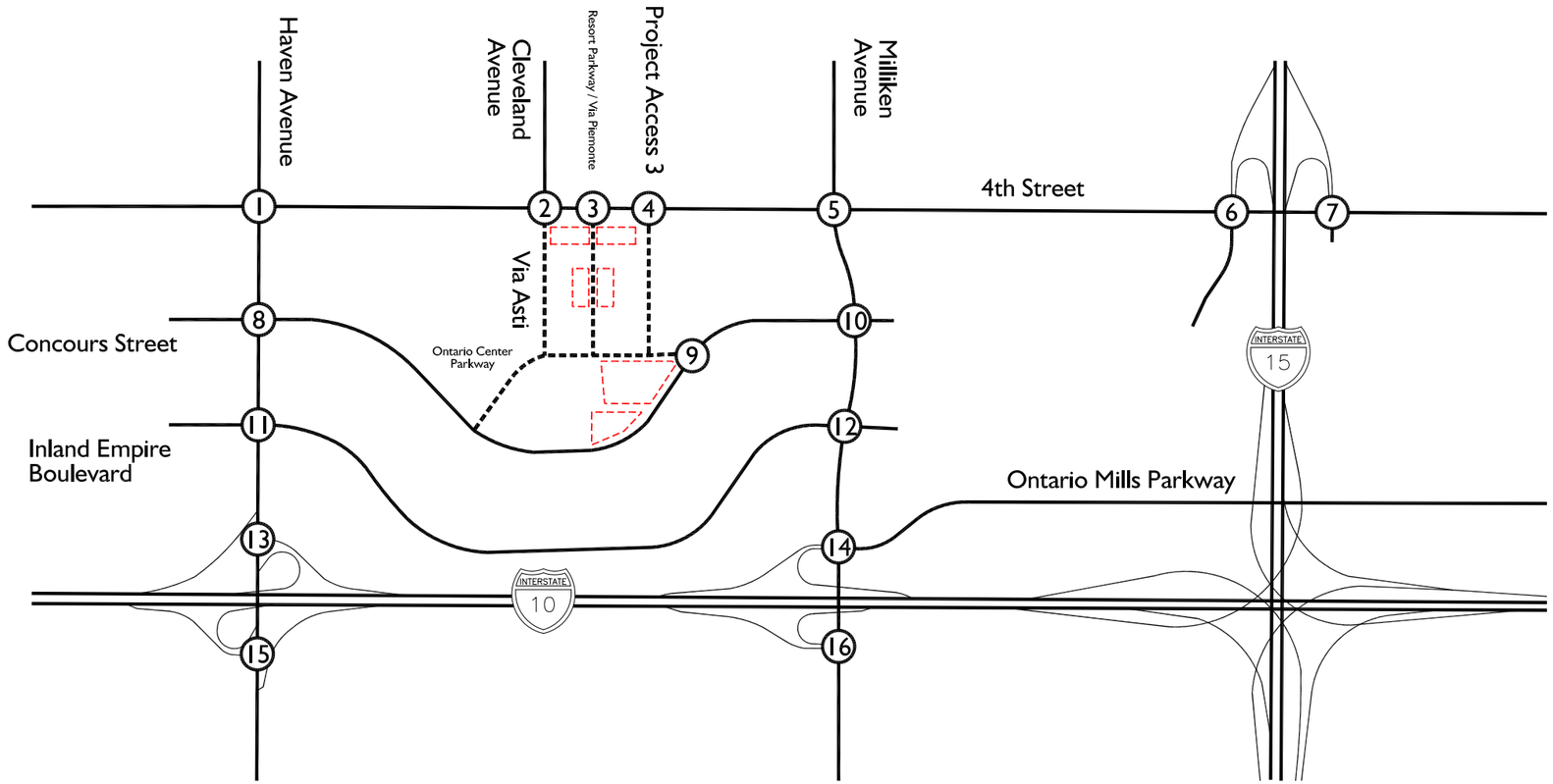


16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

N

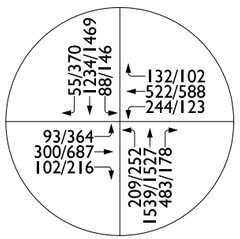
RK engineering group, inc.

Opening Year Without Related Projects Without Project Conditions Traffic Volumes - Weekday

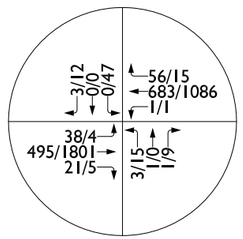


Legend:

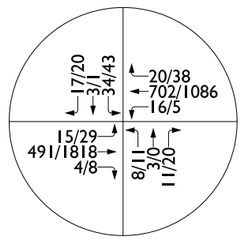
10/20 = AM/PM Peak Hour Volumes



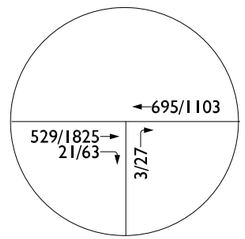
1. Haven Street (NS) & Fourth Street (EW)



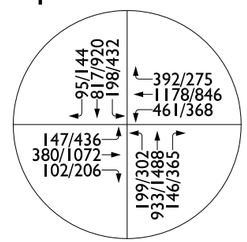
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)



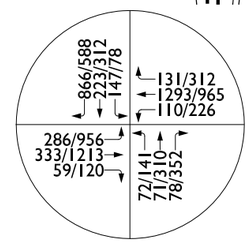
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)



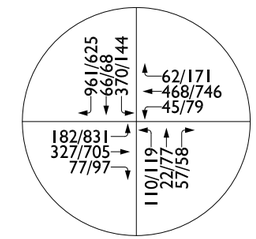
4. Project Street Access 3 (NS) & Fourth Street (EW)



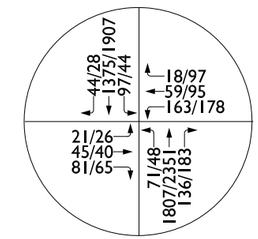
5. Milliken Avenue (NS) & Fourth Street (EW)



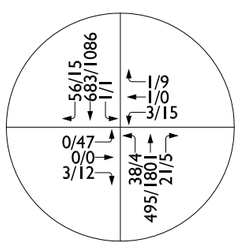
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)



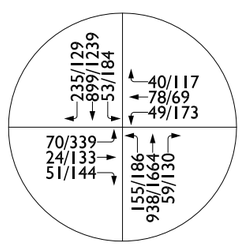
7. I-15 NB Ramps (NS) & Fourth Street (EW)



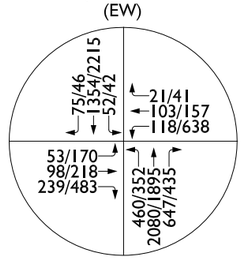
8. Haven Avenue (NS) & Concours Street (EW)



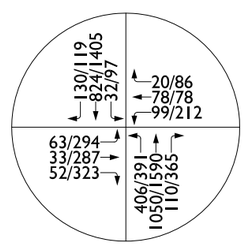
9. Concours Street (NS) & Ontario Center Parkway (EW)



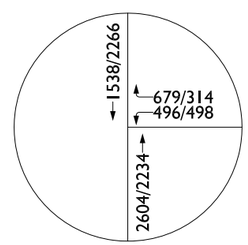
10. Milliken Street (NS) & Concours Street (EW)



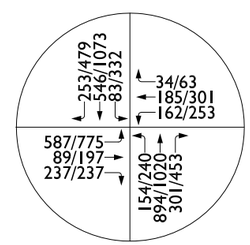
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)



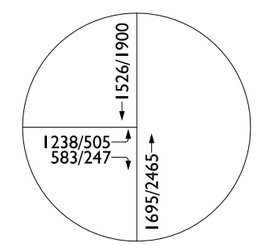
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)



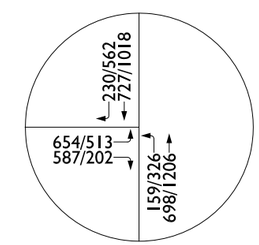
13. Haven Avenue (NS) & I-10 WB Ramps (EW)



14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)



15. Haven Avenue (NS) & I-10 EB Ramps (EW)

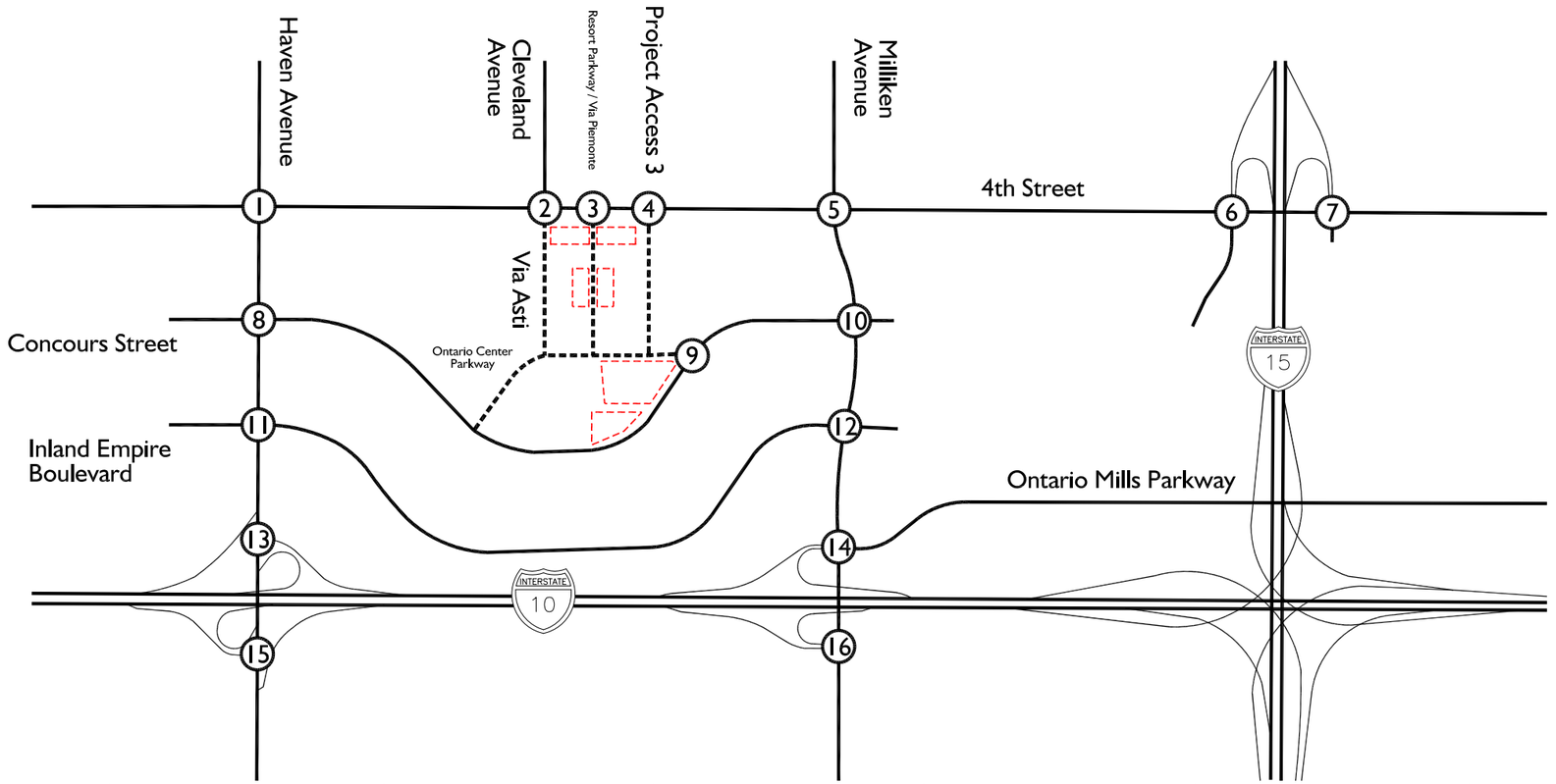


16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

N

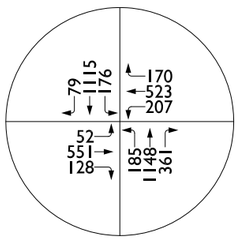
RK engineering group, inc.

Project Opening Year Without Related Projects Without Project Conditions Traffic Volumes - Saturday

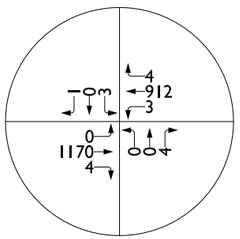


Legend:

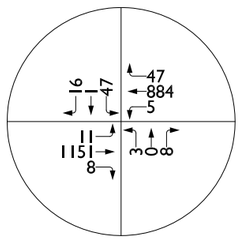
10 = Saturday Peak Hour Volumes



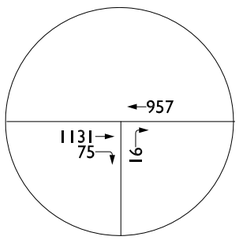
1. Haven Street (NS) & Fourth Street (EW)



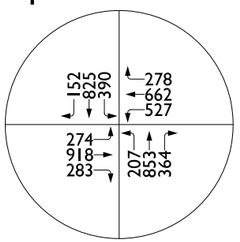
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)



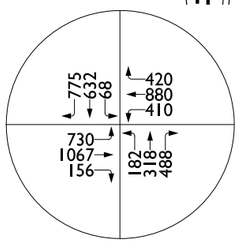
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)



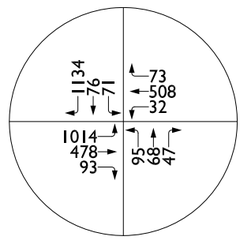
4. Project Street Access 3 (NS) & Fourth Street (EW)



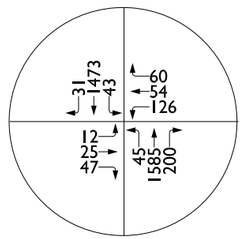
5. Milliken Avenue (NS) & Fourth Street (EW)



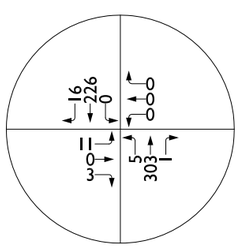
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)



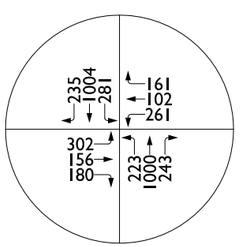
7. I-15 NB Ramps (NS) & Fourth Street (EW)



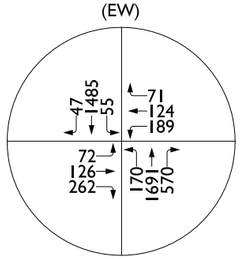
8. Haven Avenue (NS) & Concours Street (EW)



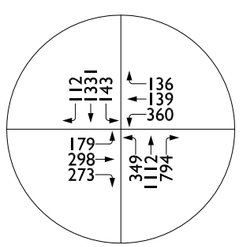
9. Concours Street (NS) & Ontario Center Parkway (EW)



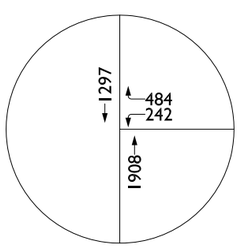
10. Milliken Street (NS) & Concours Street (EW)



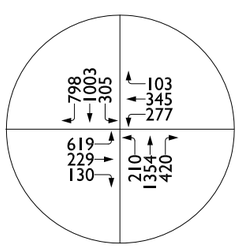
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)



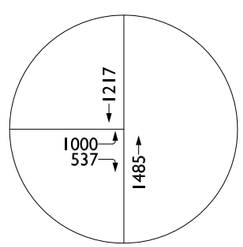
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)



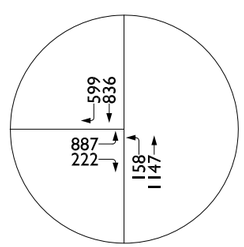
13. Haven Avenue (NS) & I-10 WB Ramps (EW)



14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)



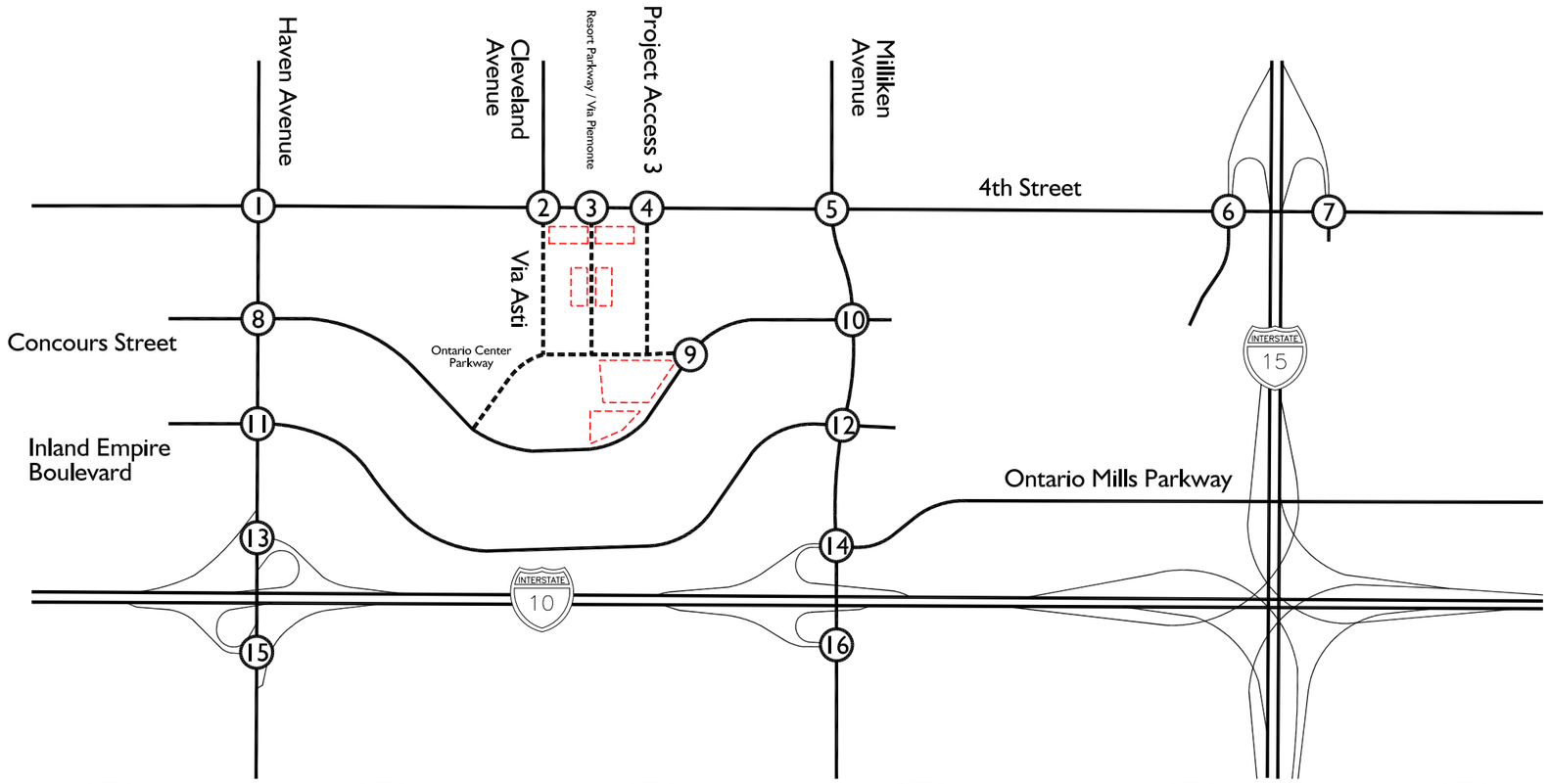
15. Haven Avenue (NS) & I-10 EB Ramps (EW)



16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

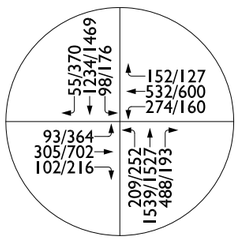
N

Opening Year Without Related Projects With Project Conditions Traffic Volumes - Weekday

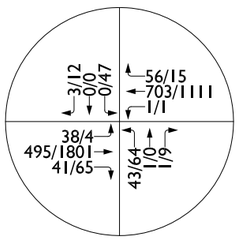


Legend:

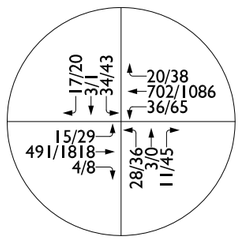
10/20 = AM/PM Peak Hour Volumes



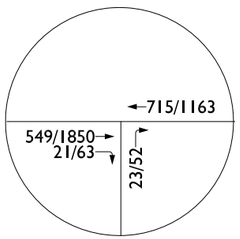
1. Haven Street (NS) & Fourth Street (EW)



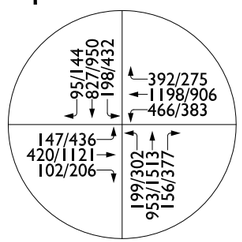
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)



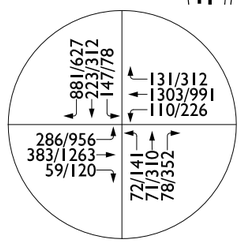
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)



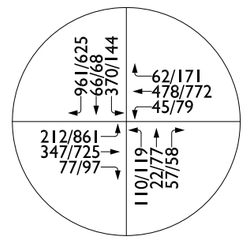
4. Project Street Access 3 (NS) & Fourth Street (EW)



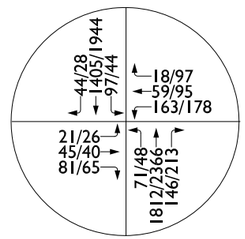
5. Milliken Avenue (NS) & Fourth Street (EW)



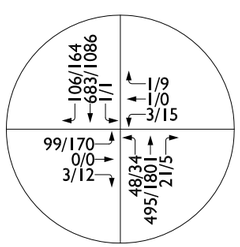
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)



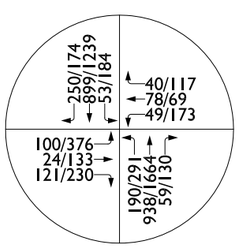
7. I-15 NB Ramps (NS) & Fourth Street (EW)



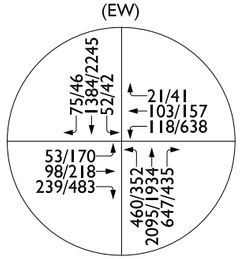
8. Haven Avenue (NS) & Concours Street (EW)



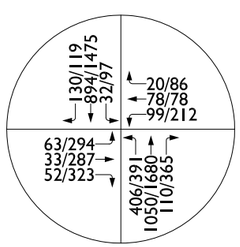
9. Concours Street (NS) & Ontario Center Parkway (EW)



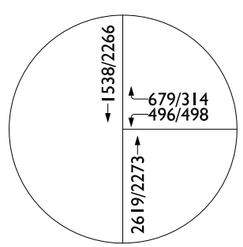
10. Milliken Street (NS) & Concours Street (EW)



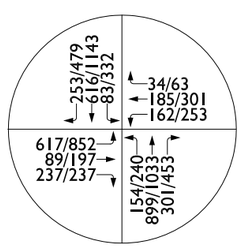
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)



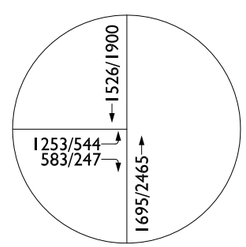
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)



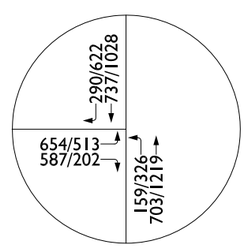
13. Haven Avenue (NS) & I-10 WB Ramps (EW)



14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)



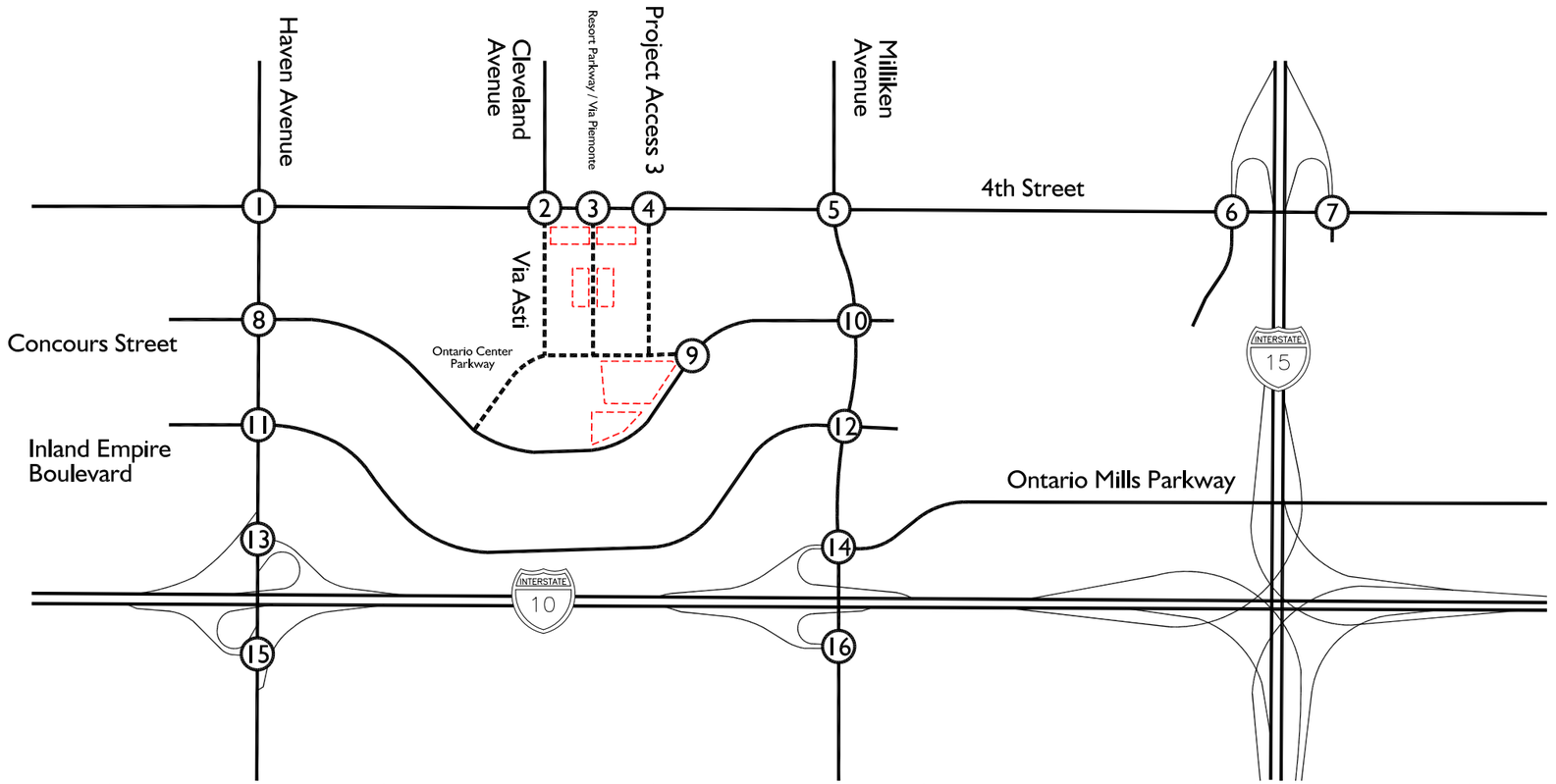
15. Haven Avenue (NS) & I-10 EB Ramps (EW)



16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

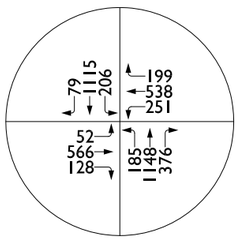
N

Project Opening Year Without Related Projects With Project Conditions Traffic Volumes - Saturday

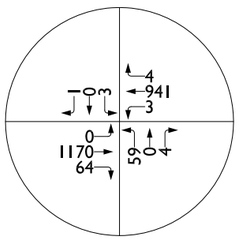


Legend:

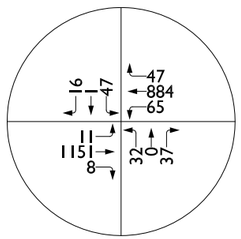
10 = Saturday Peak Hour Volumes



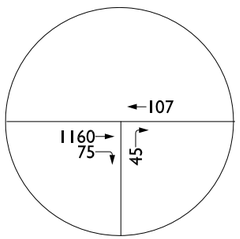
1. Haven Street (NS) & Fourth Street (EW)



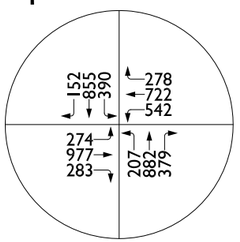
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)



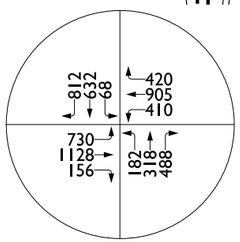
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)



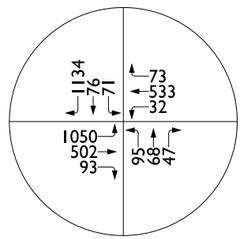
4. Project Street Access 3 (NS) & Fourth Street (EW)



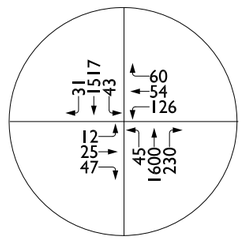
5. Milliken Avenue (NS) & Fourth Street (EW)



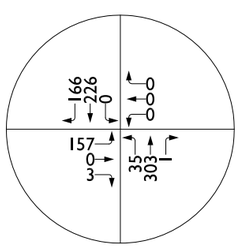
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)



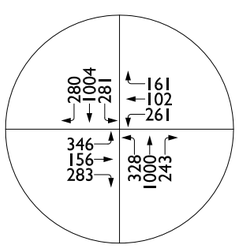
7. I-15 NB Ramps (NS) & Fourth Street (EW)



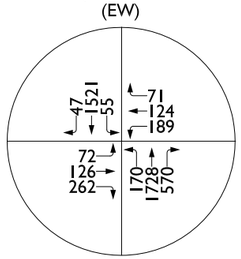
8. Haven Avenue (NS) & Concours Street (EW)



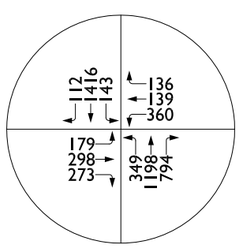
9. Concours Street (NS) & Ontario Center Parkway (EW)



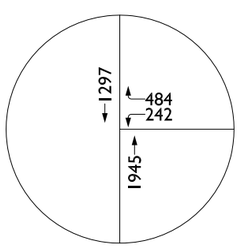
10. Milliken Street (NS) & Concours Street (EW)



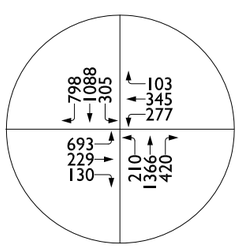
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)



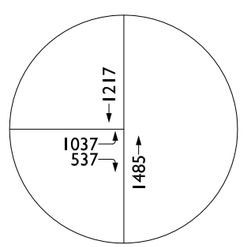
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)



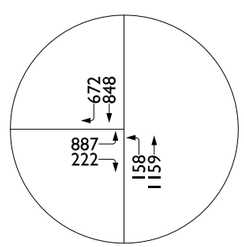
13. Haven Avenue (NS) & I-10 WB Ramps (EW)



14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)



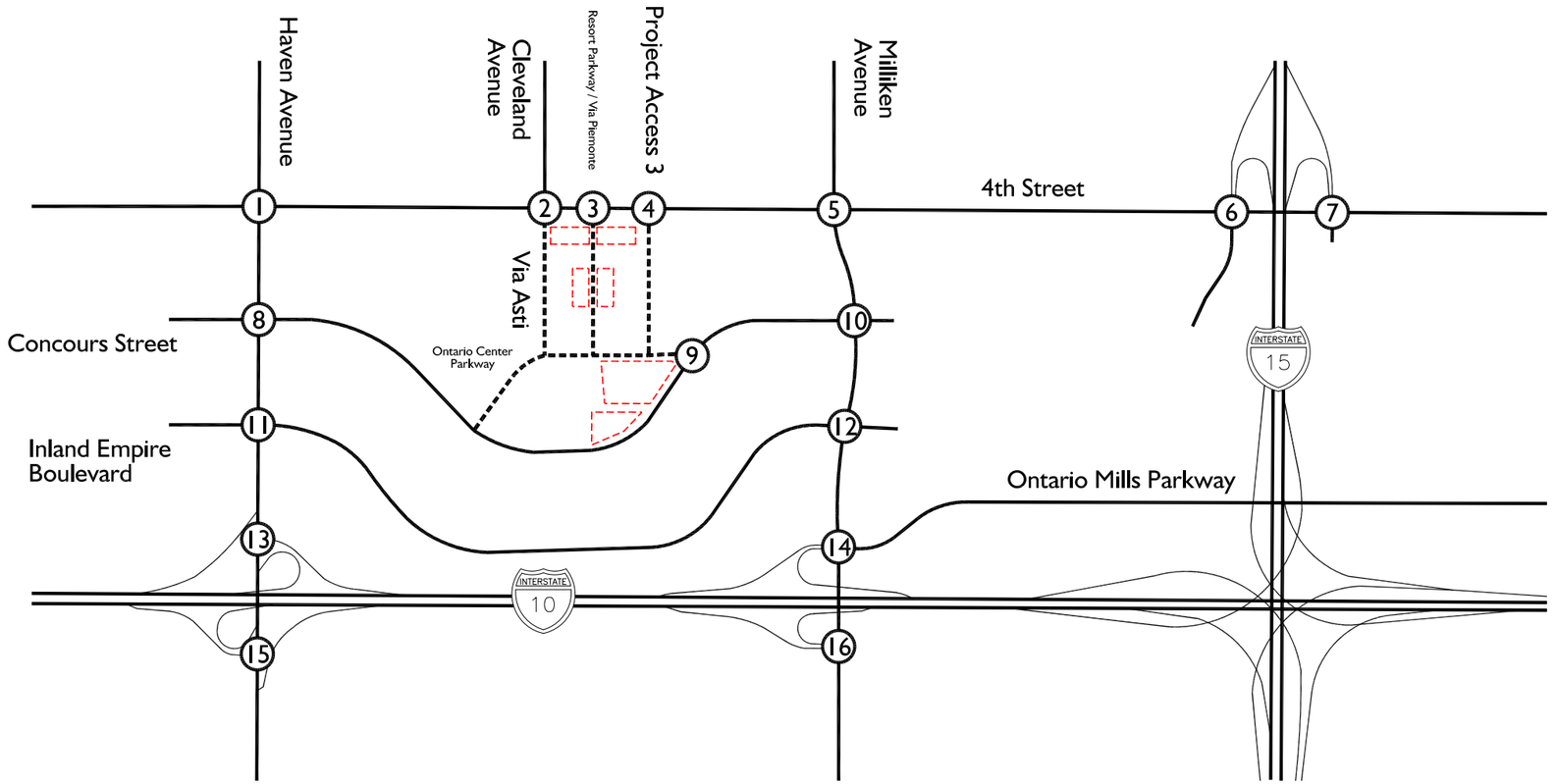
15. Haven Avenue (NS) & I-10 EB Ramps (EW)



16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

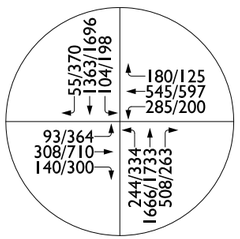
N

Opening Year With Related Projects Without Project Conditions Traffic Volumes - Weekday

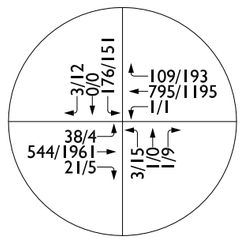


Legend:

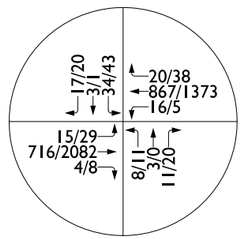
10/20 = AM/PM Peak Hour Volumes



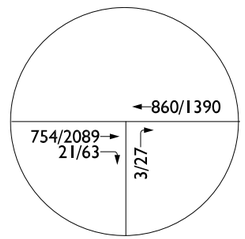
1. Haven Street (NS) & Fourth Street (EW)



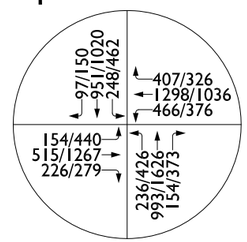
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)



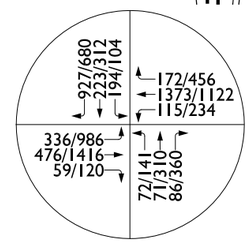
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)



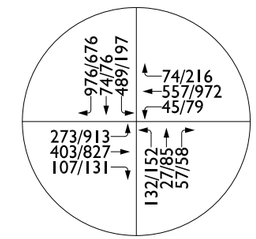
4. Project Street Access 3 (NS) & Fourth Street (EW)



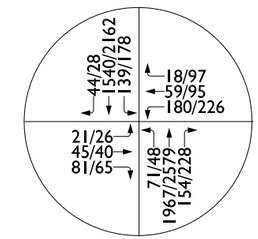
5. Milliken Avenue (NS) & Fourth Street (EW)



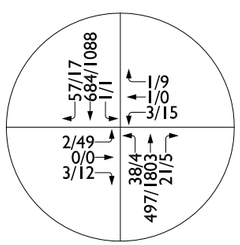
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)



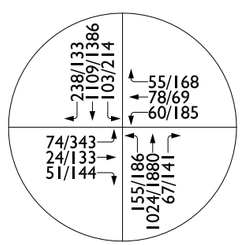
7. I-15 NB Ramps (NS) & Fourth Street (EW)



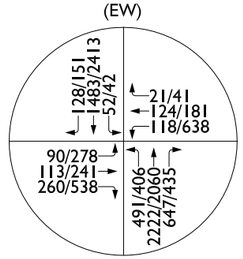
8. Haven Avenue (NS) & Concours Street (EW)



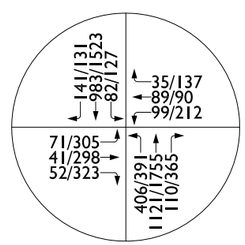
9. Concours Street (NS) & Ontario Center Parkway (EW)



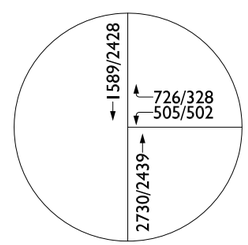
10. Milliken Street (NS) & Concours Street (EW)



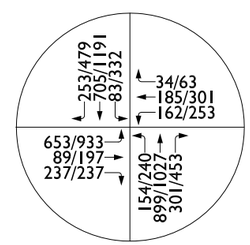
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)



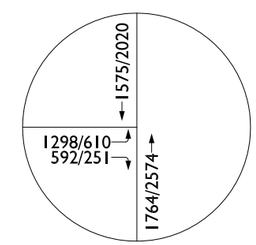
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)



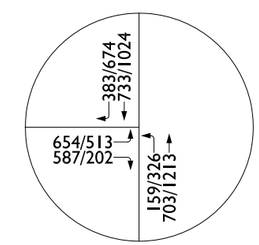
13. Haven Avenue (NS) & I-10 WB Ramps (EW)



14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)



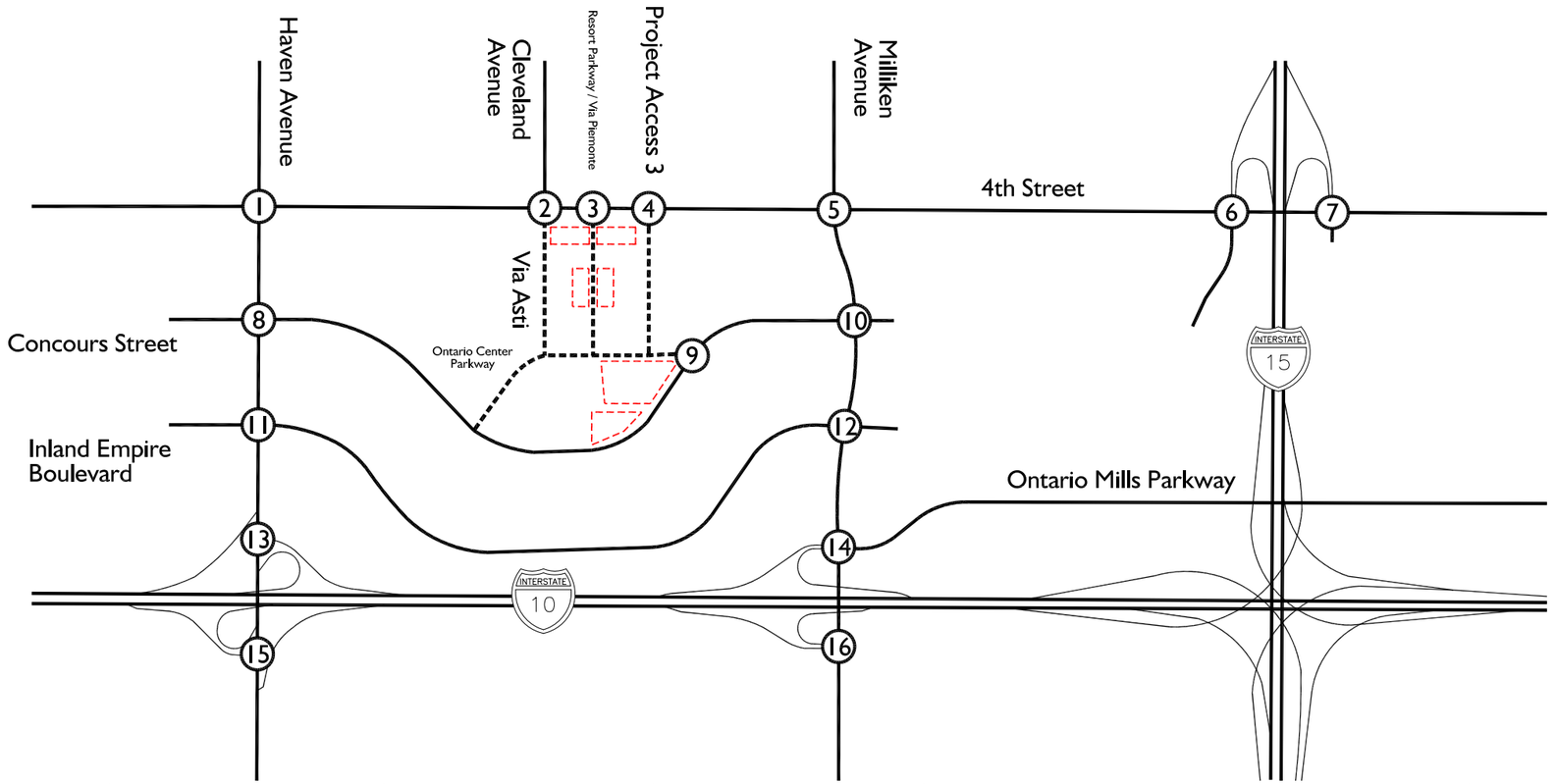
15. Haven Avenue (NS) & I-10 EB Ramps (EW)



16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

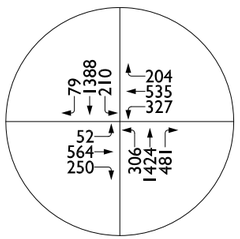
N

Project Opening Year With Related Projects Without Project Conditions Traffic Volumes – Saturday

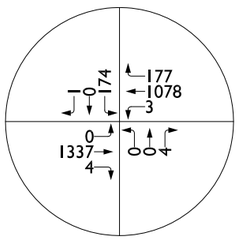


Legend:

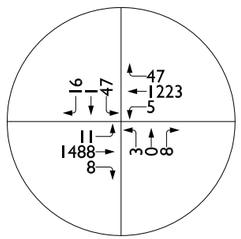
10 = Saturday Peak Hour Volumes



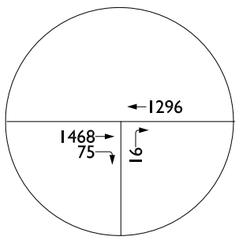
1. Haven Street (NS) & Fourth Street (EW)



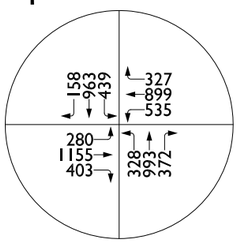
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)



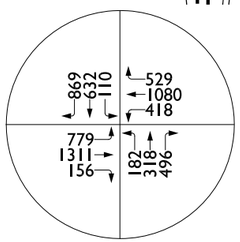
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)



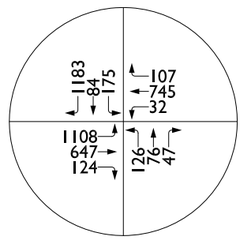
4. Project Street Access 3 (NS) & Fourth Street (EW)



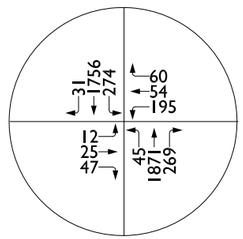
5. Milliken Avenue (NS) & Fourth Street (EW)



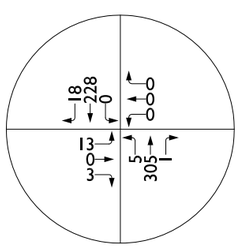
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)



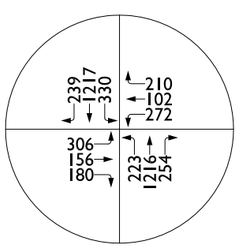
7. I-15 NB Ramps (NS) & Fourth Street (EW)



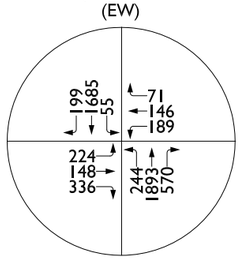
8. Haven Avenue (NS) & Concours Street (EW)



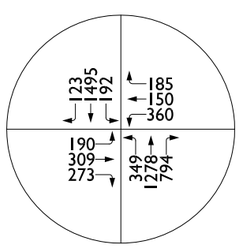
9. Concours Street (NS) & Ontario Center Parkway (EW)



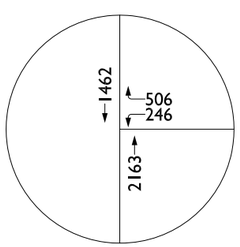
10. Milliken Street (NS) & Concours Street (EW)



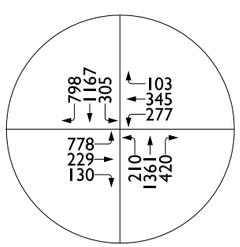
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)



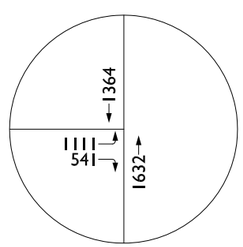
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)



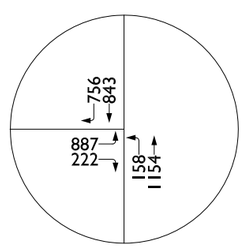
13. Haven Avenue (NS) & I-10 WB Ramps (EW)



14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)



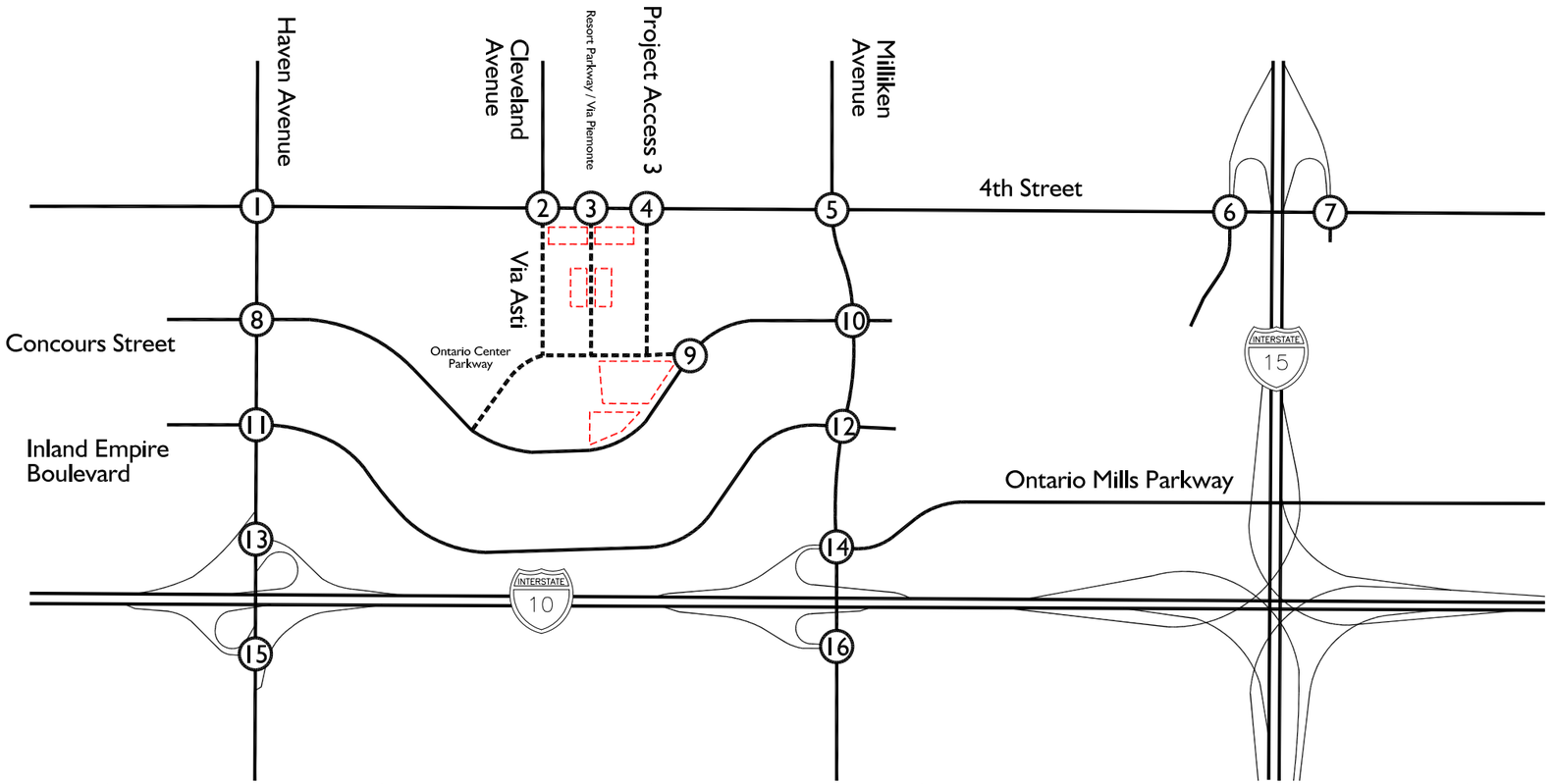
15. Haven Avenue (NS) & I-10 EB Ramps (EW)



16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

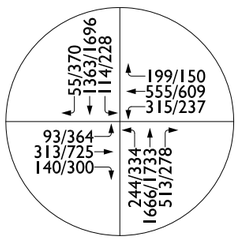
N

Opening Year With Related Projects With Project Conditions Traffic Volumes - Weekday

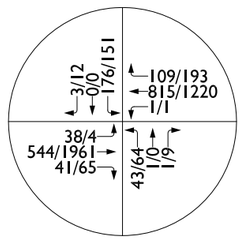


Legend:

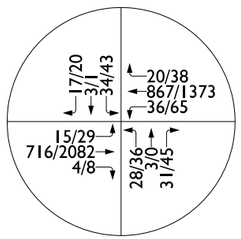
10/20 = AM/PM Peak Hour Volumes



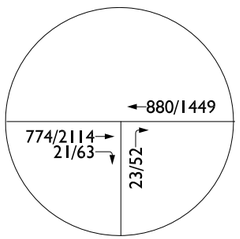
1. Haven Street (NS) & Fourth Street (EW)



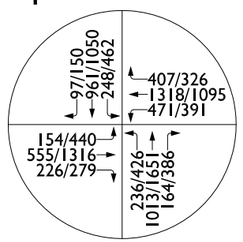
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)



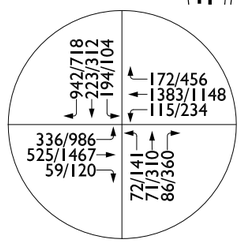
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)



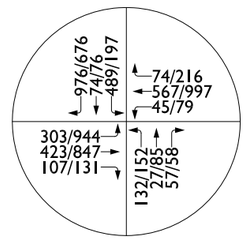
4. Project Street Access 3 (NS) & Fourth Street (EW)



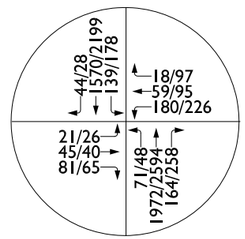
5. Milliken Avenue (NS) & Fourth Street (EW)



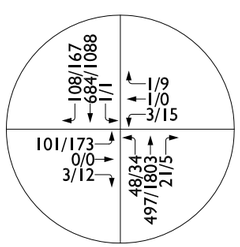
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)



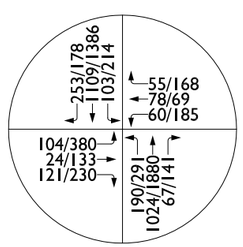
7. I-15 NB Ramps (NS) & Fourth Street (EW)



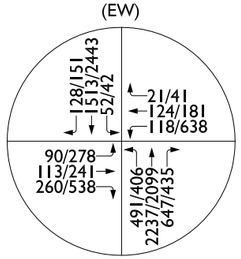
8. Haven Avenue (NS) & Concours Street (EW)



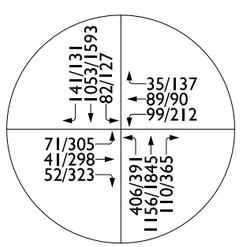
9. Concours Street (NS) & Ontario Center Parkway (EW)



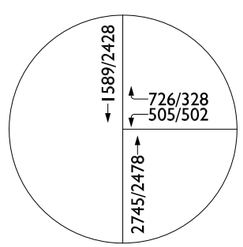
10. Milliken Street (NS) & Concours Street (EW)



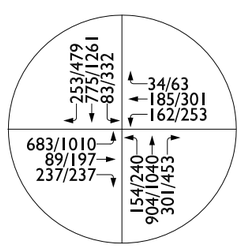
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)



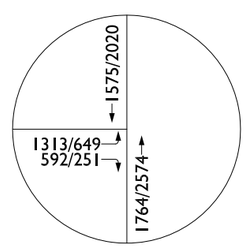
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)



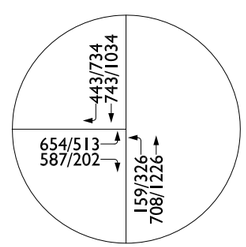
13. Haven Avenue (NS) & I-10 WB Ramps (EW)



14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)



15. Haven Avenue (NS) & I-10 EB Ramps (EW)



16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

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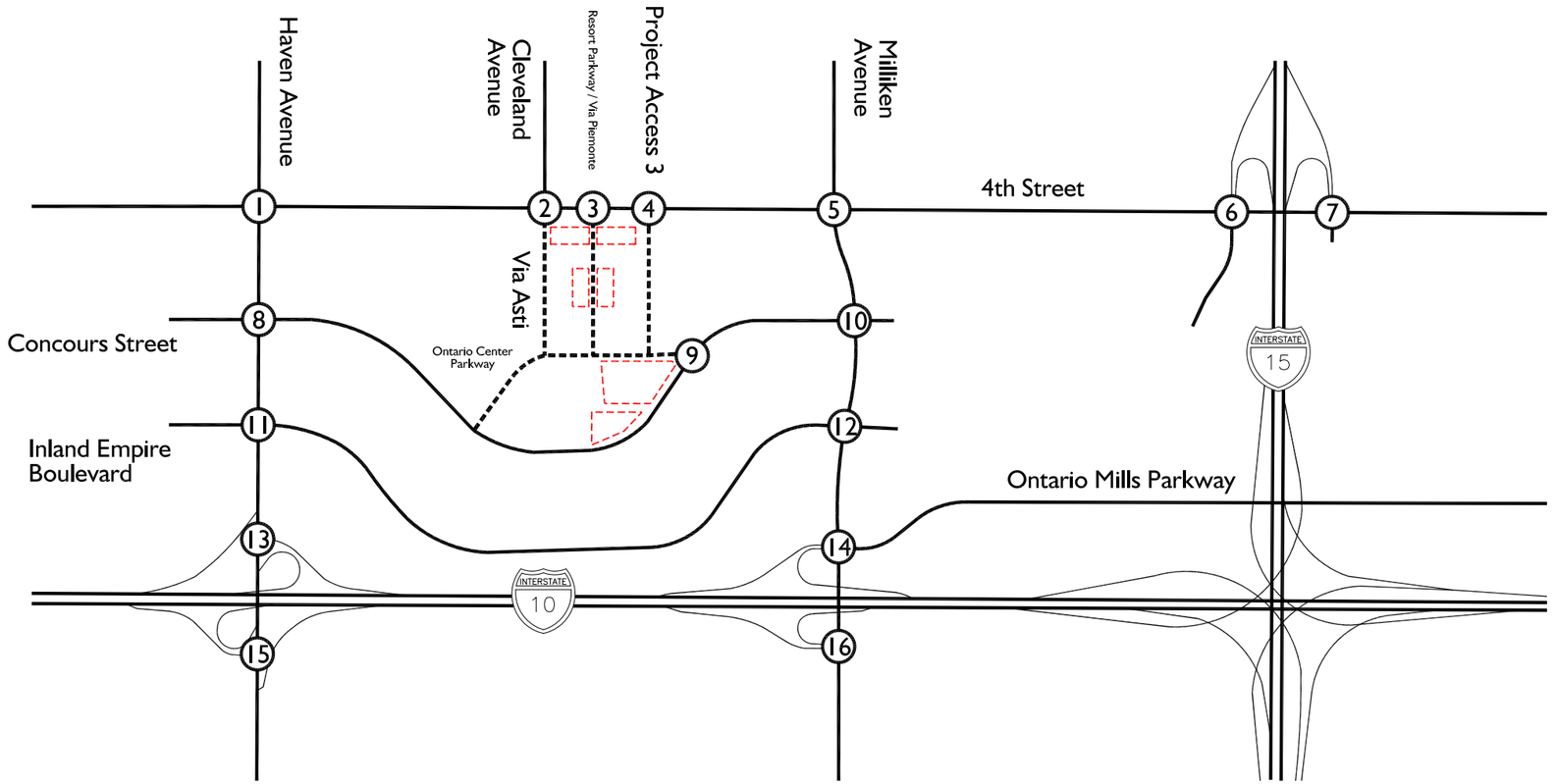
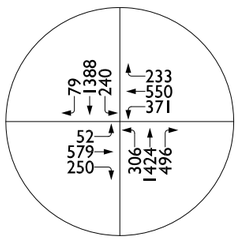
RK engineering group, inc.

Project Opening Year With Related Projects With Project Conditions Traffic Volumes - Saturday

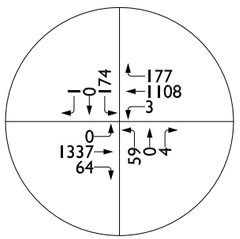


Legend:

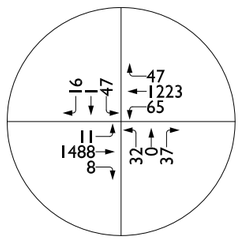
10 = Saturday Peak Hour Volumes



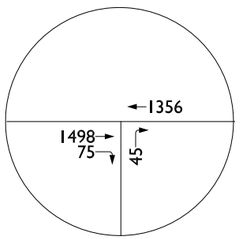
1. Haven Street (NS) & Fourth Street (EW)



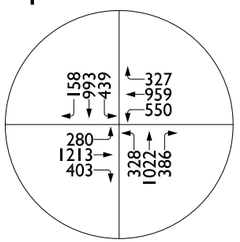
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)



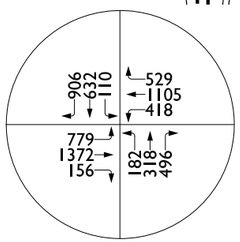
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)



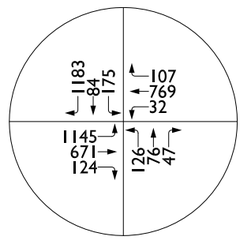
4. Project Street Access 3 (NS) & Fourth Street (EW)



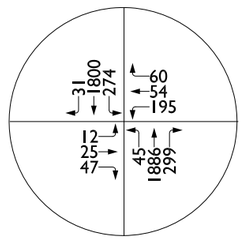
5. Milliken Avenue (NS) & Fourth Street (EW)



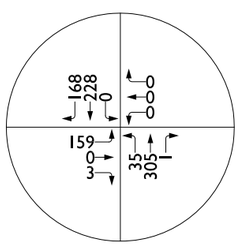
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)



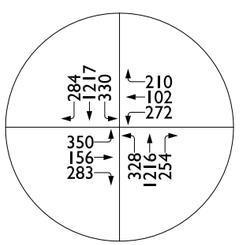
7. I-15 NB Ramps (NS) & Fourth Street (EW)



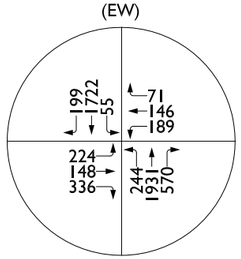
8. Haven Avenue (NS) & Concours Street (EW)



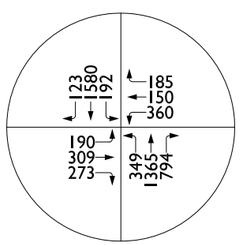
9. Concours Street (NS) & Ontario Center Parkway (EW)



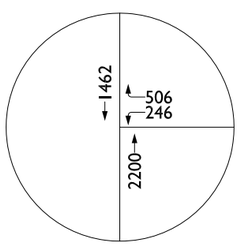
10. Milliken Street (NS) & Concours Street (EW)



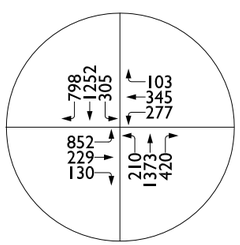
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)



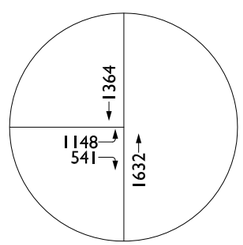
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)



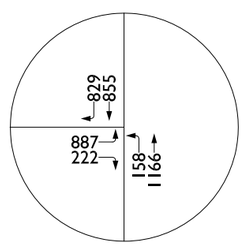
13. Haven Avenue (NS) & I-10 WB Ramps (EW)



14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)



15. Haven Avenue (NS) & I-10 EB Ramps (EW)

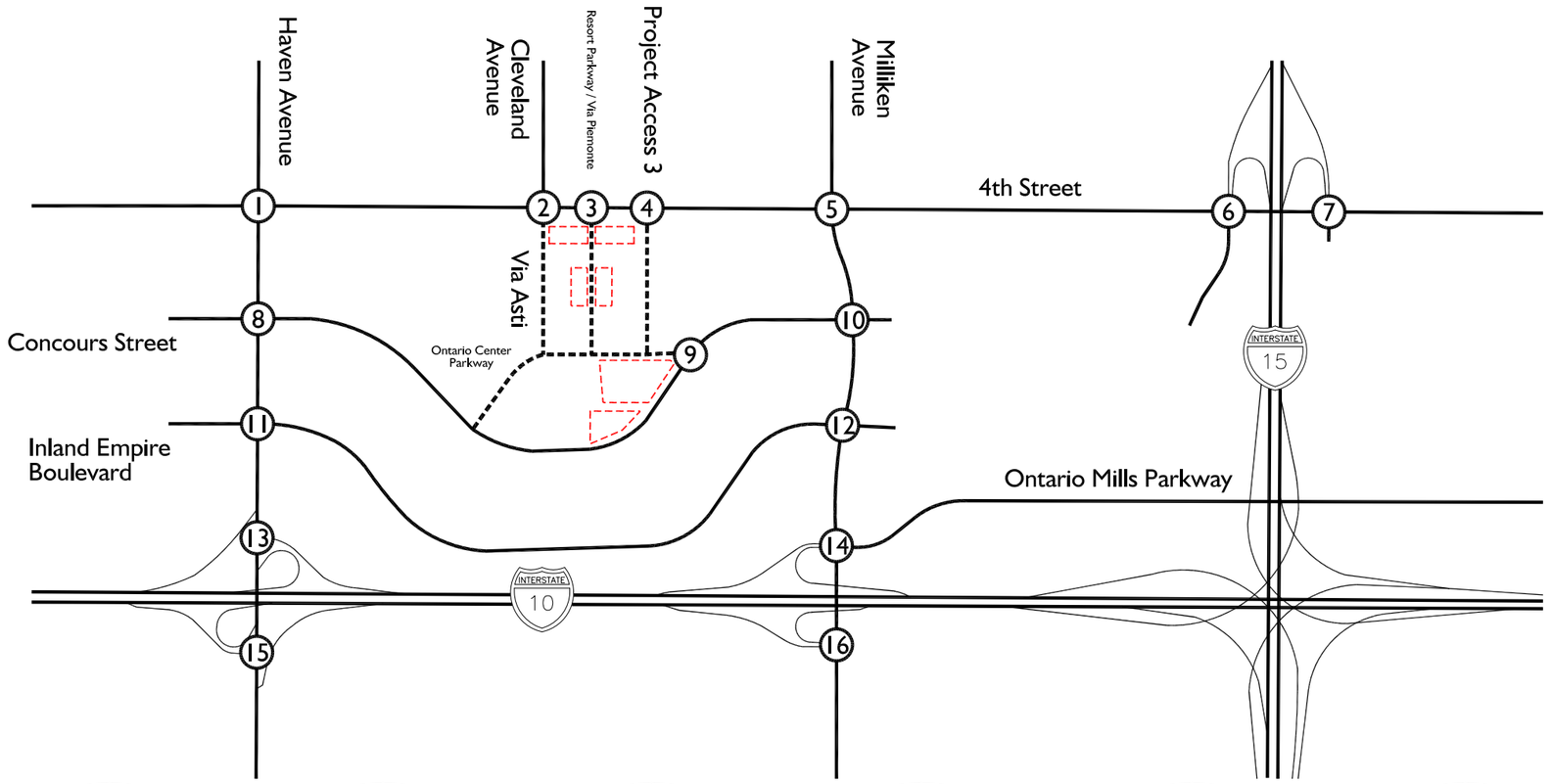


16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

N

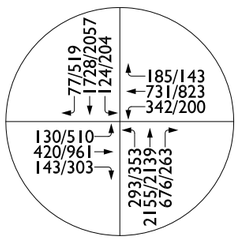
Exhibit 4-1

Horizon Year (2040) Without Project Conditions - Weekday

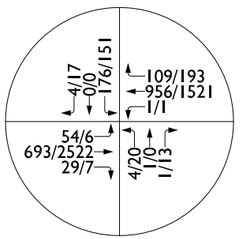


Legend:

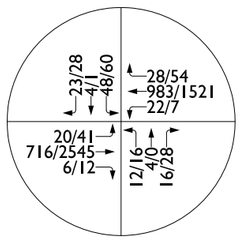
10/20 = AM/PM Peak Hour Volumes



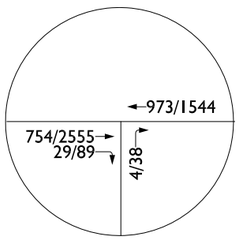
1. Haven Street (NS) & Fourth Street (EW)



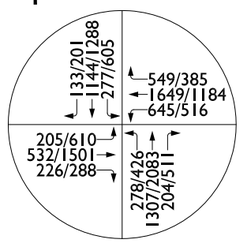
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)



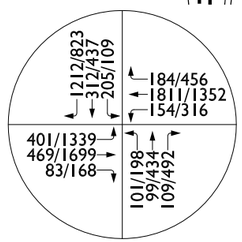
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)



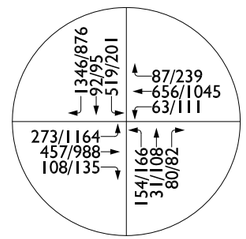
4. Project Street Access 3 (NS) & Fourth Street (EW)



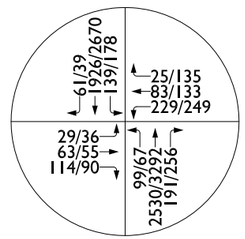
5. Milliken Avenue (NS) & Fourth Street (EW)



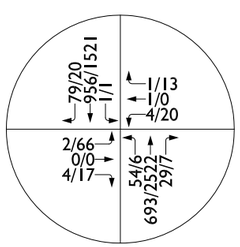
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)



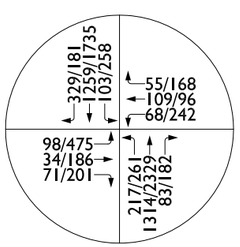
7. I-15 NB Ramps (NS) & Fourth Street (EW)



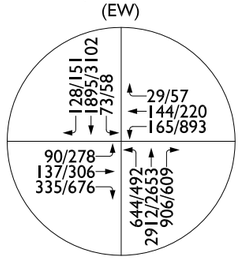
8. Haven Avenue (NS) & Concours Street (EW)



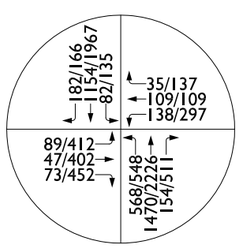
9. Concours Street (NS) & Ontario Center Parkway (EW)



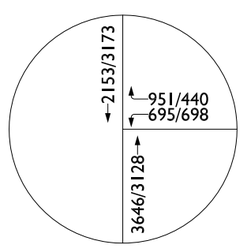
10. Milliken Street (NS) & Concours Street (EW)



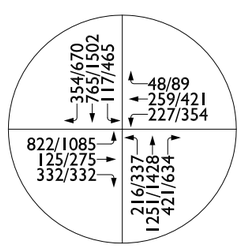
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)



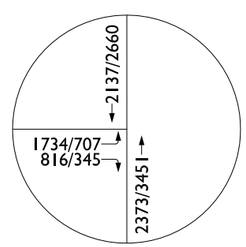
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)



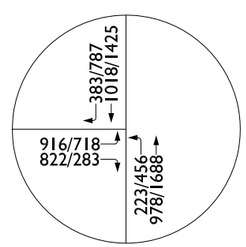
13. Haven Avenue (NS) & I-10 WB Ramps (EW)



14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)



15. Haven Avenue (NS) & I-10 EB Ramps (EW)

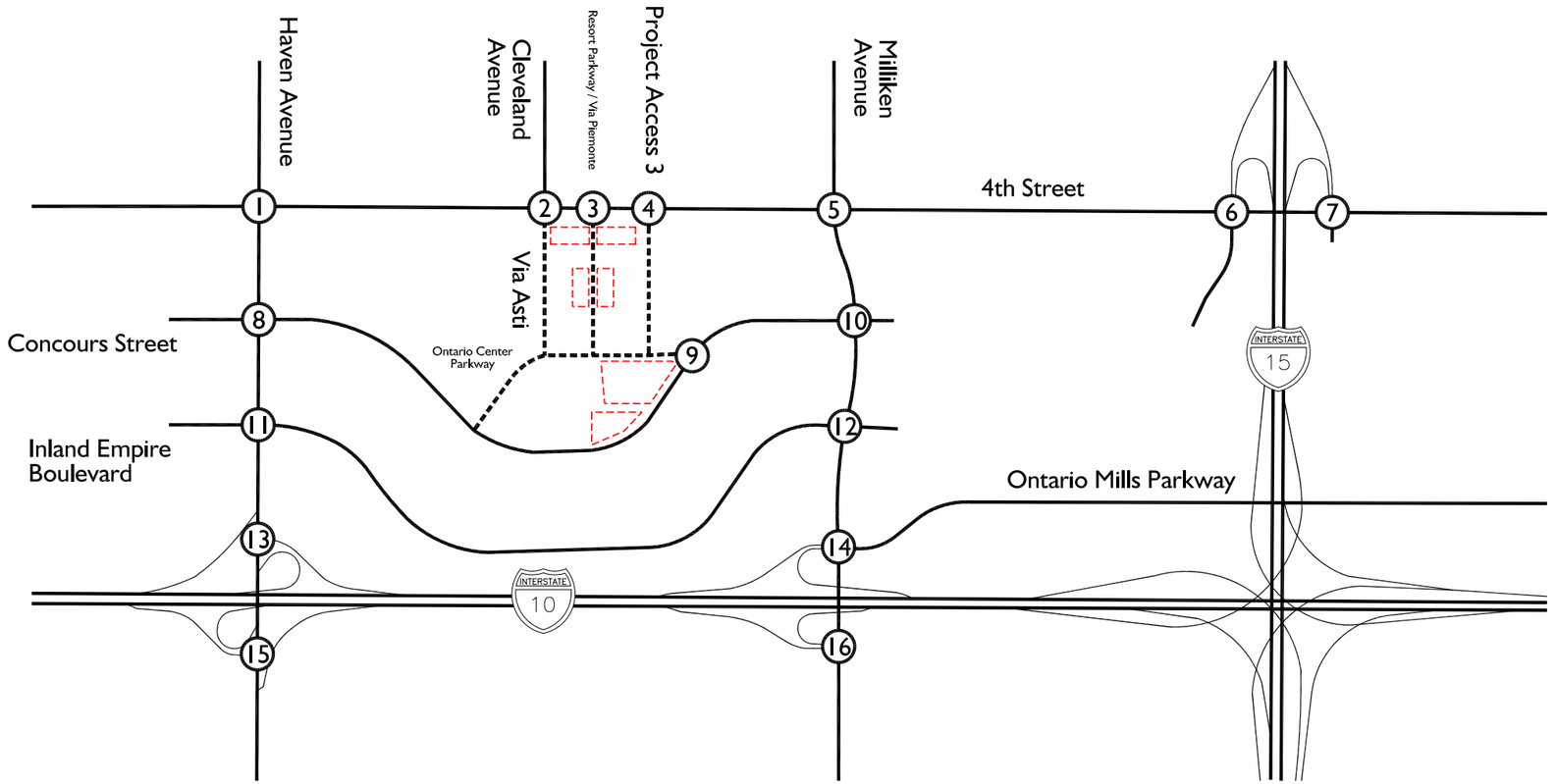


16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

N

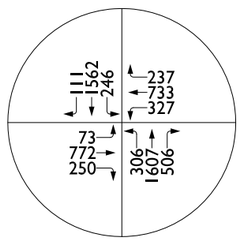
RK engineering group, inc.

Horizon Year (2040) Without Project Conditions - Saturday

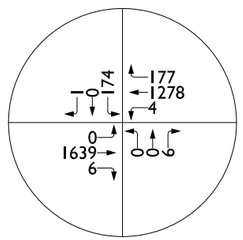


Legend:

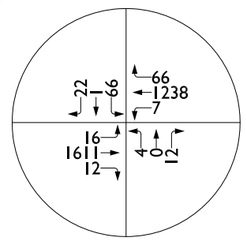
10 = Saturday Peak Hour Volumes



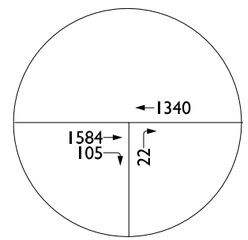
1. Haven Street (NS) & Fourth Street (EW)



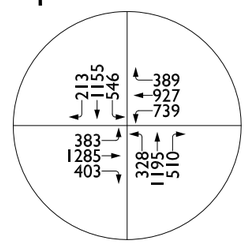
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)



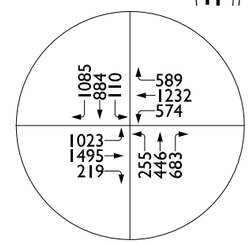
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)



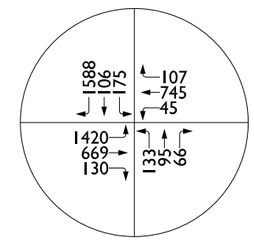
4. Project Street Access 3 (NS) & Fourth Street (EW)



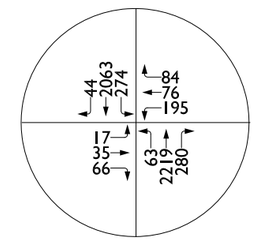
5. Milliken Avenue (NS) & Fourth Street (EW)



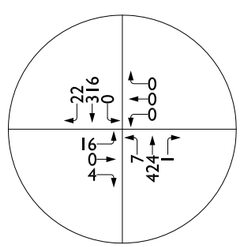
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)



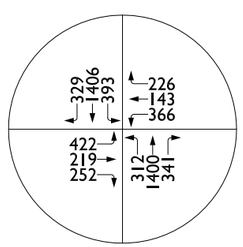
7. I-15 NB Ramps (NS) & Fourth Street (EW)



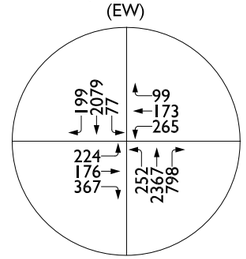
8. Haven Avenue (NS) & Concours Street (EW)



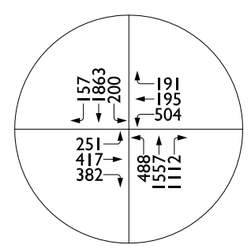
9. Concours Street (NS) & Ontario Center Parkway (EW)



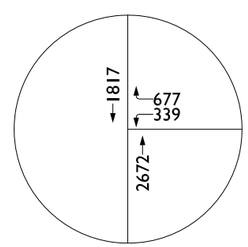
10. Milliken Street (NS) & Concours Street (EW)



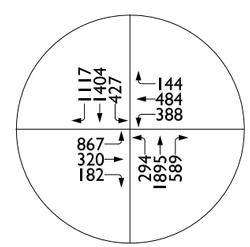
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)



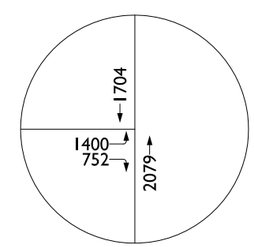
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)



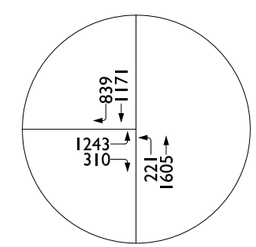
13. Haven Avenue (NS) & I-10 WB Ramps (EW)



14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)



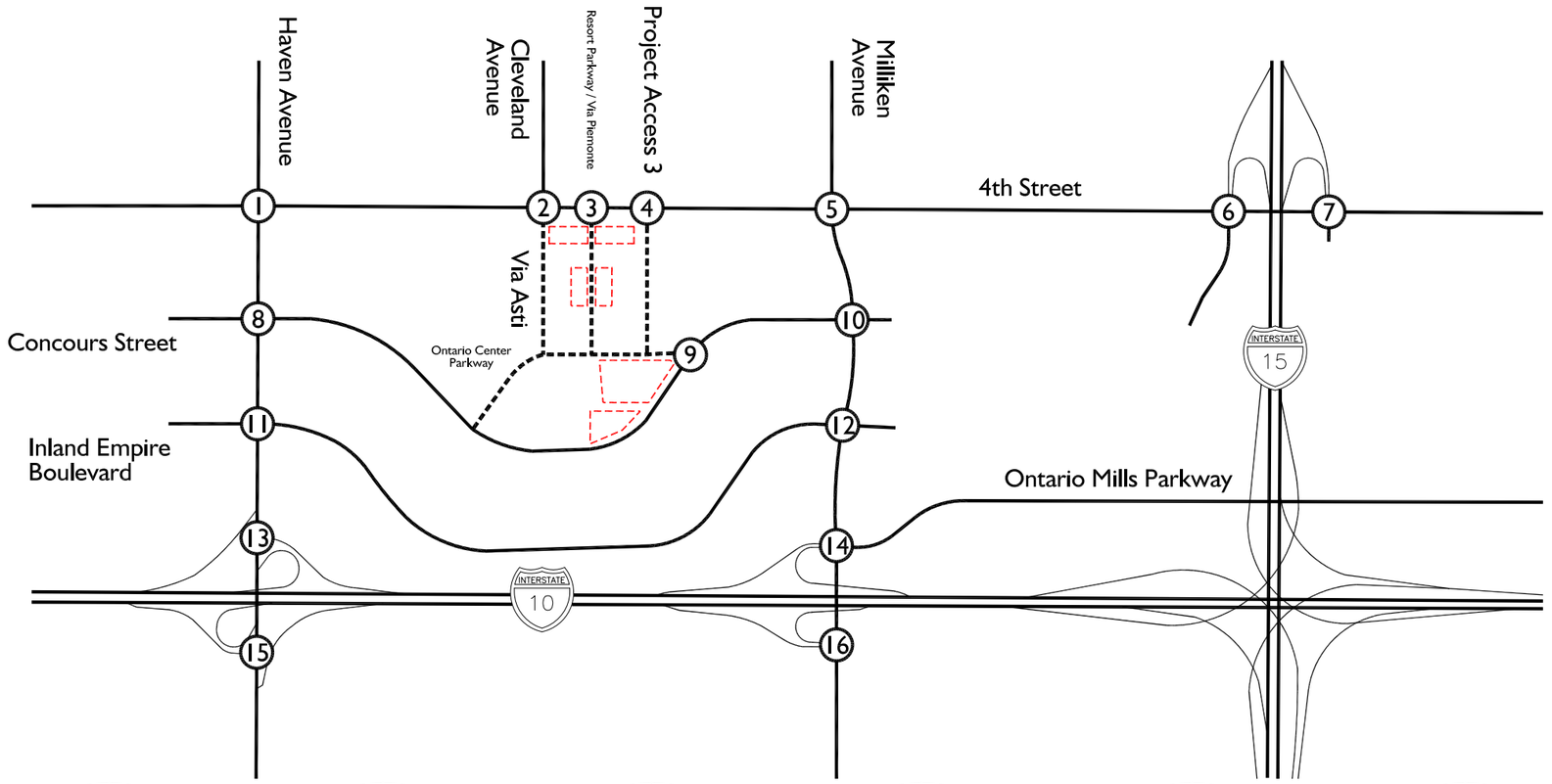
15. Haven Avenue (NS) & I-10 EB Ramps (EW)



16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

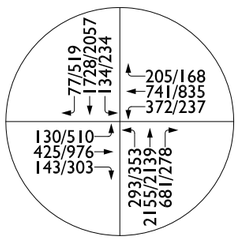
N

Horizon Year (2040) With Project Conditions - Weekday

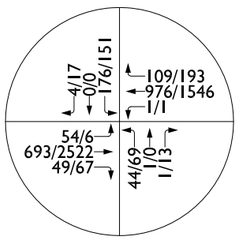


Legend:

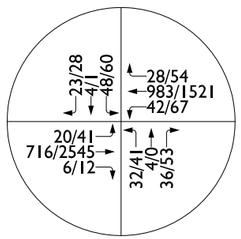
10/20 = AM/PM Peak Hour Volumes



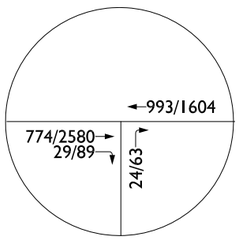
1. Haven Street (NS) & Fourth Street (EW)



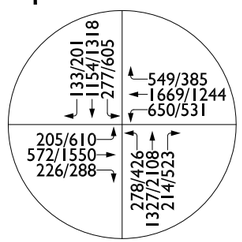
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)



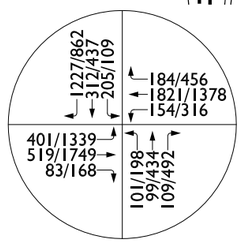
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)



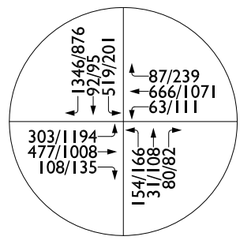
4. Project Street Access 3 (NS) & Fourth Street (EW)



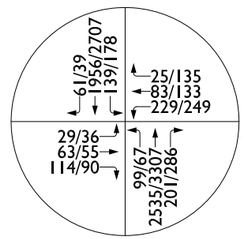
5. Milliken Avenue (NS) & Fourth Street (EW)



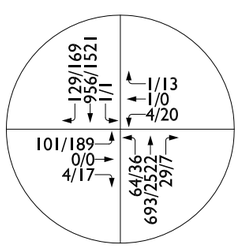
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)



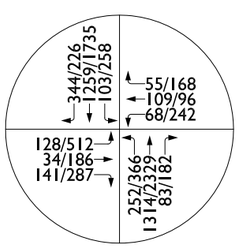
7. I-15 NB Ramps (NS) & Fourth Street (EW)



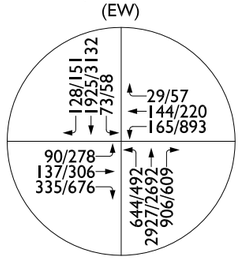
8. Haven Avenue (NS) & Concours Street (EW)



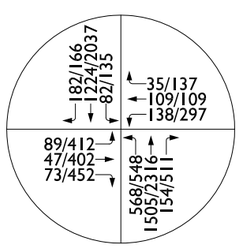
9. Concours Street (NS) & Ontario Center Parkway (EW)



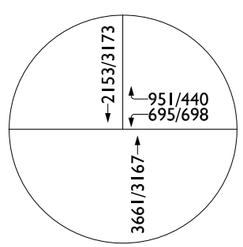
10. Milliken Street (NS) & Concours Street (EW)



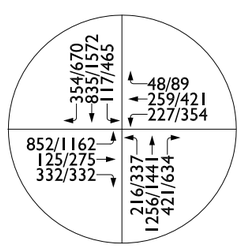
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)



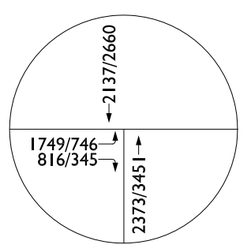
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)



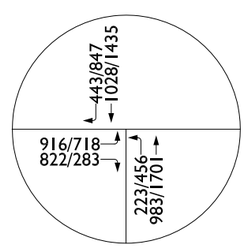
13. Haven Avenue (NS) & I-10 WB Ramps (EW)



14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)



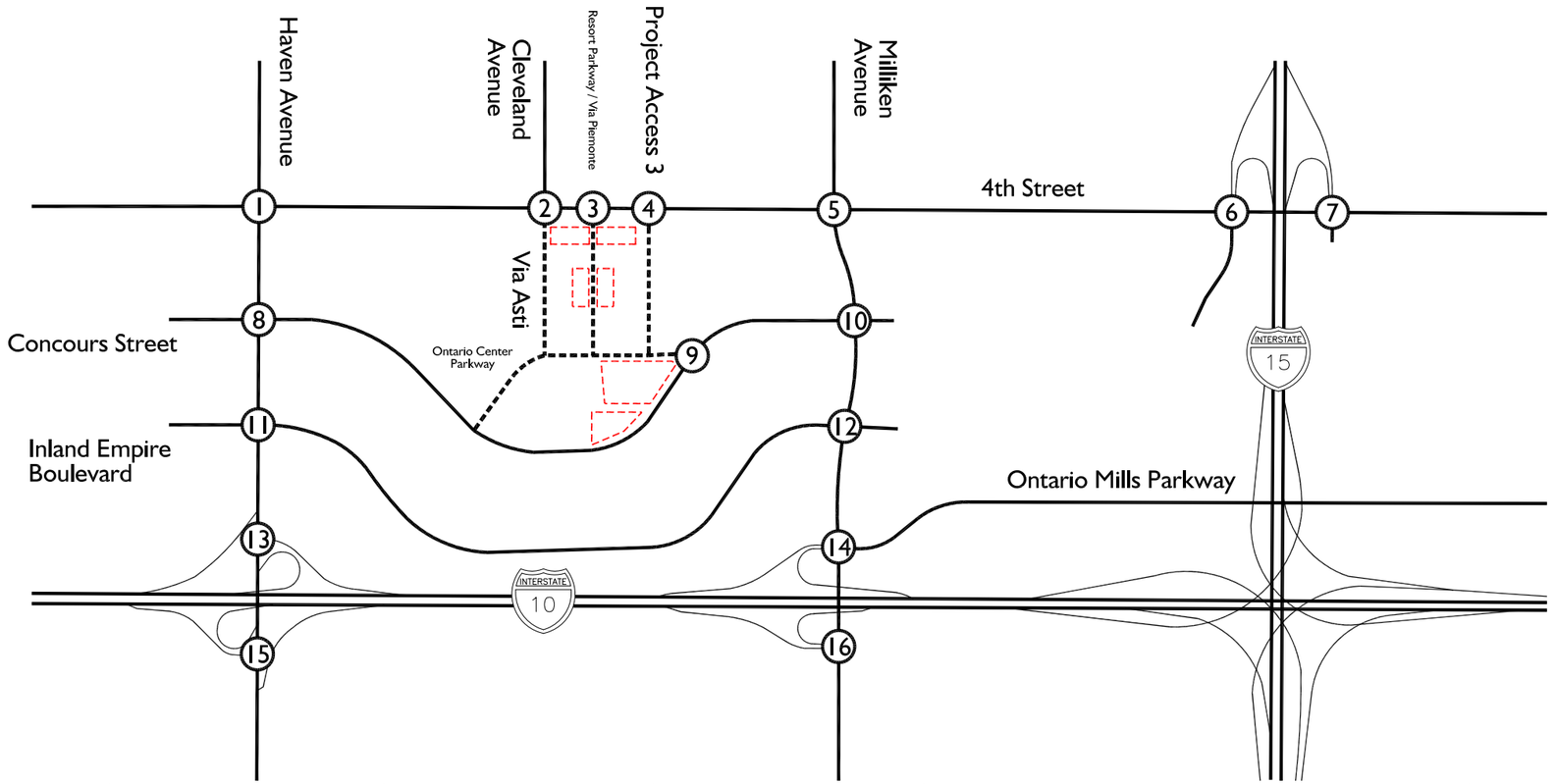
15. Haven Avenue (NS) & I-10 EB Ramps (EW)



16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

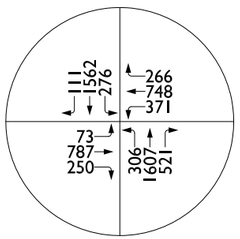
N

Horizon Year (2040) With Project Conditions - Saturday

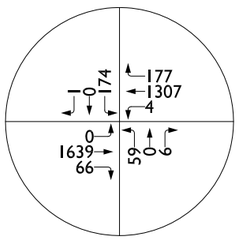


Legend:

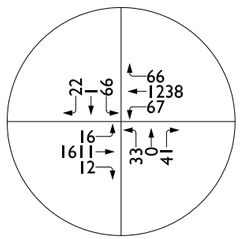
10 = Saturday Peak Hour Volumes



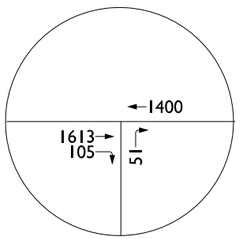
1. Haven Street (NS) & Fourth Street (EW)



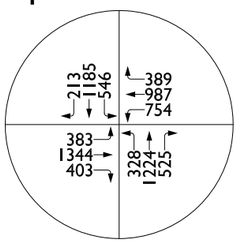
2. Cleveland Avenue -Via Asti (NS) & Fourth Street (EW)



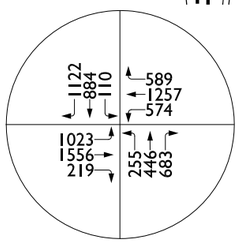
3. Resort Parkway - Via Piemonte (NS) & Fourth Street (EW)



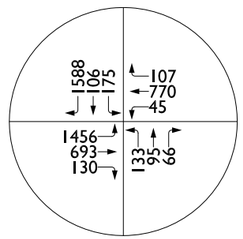
4. Project Street Access 3 (NS) & Fourth Street (EW)



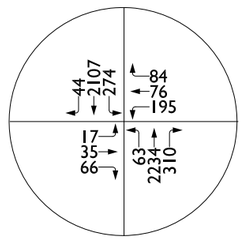
5. Milliken Avenue (NS) & Fourth Street (EW)



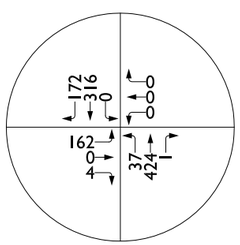
6. I-15 SB Ramps - Ontario Mills Drive (NS) & Fourth Street (EW)



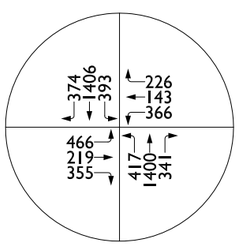
7. I-15 NB Ramps (NS) & Fourth Street (EW)



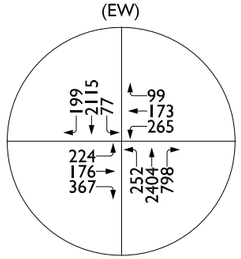
8. Haven Avenue (NS) & Concours Street (EW)



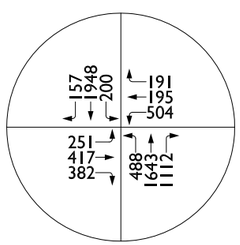
9. Concours Street (NS) & Ontario Center Parkway (EW)



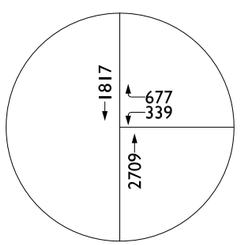
10. Milliken Street (NS) & Concours Street (EW)



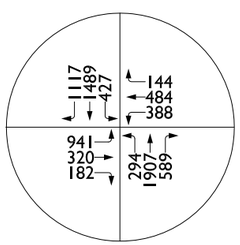
11. Haven Avenue (NS) & Inland Empire Boulevard (EW)



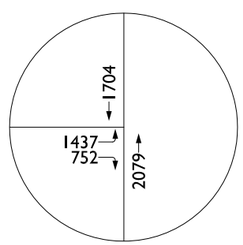
12. Milliken Avenue (NS) & Inland Empire Boulevard (EW)



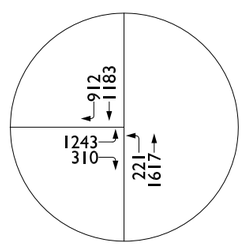
13. Haven Avenue (NS) & I-10 WB Ramps (EW)



14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)



15. Haven Avenue (NS) & I-10 EB Ramps (EW)



16. Milliken Avenue(NS) & I-10 EB Ramps Avenue (EW)

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RK engineering group, inc.

Table 4-1
ITE Trip Generation Rates[1]

Land Use	Units[2]	ITE Code	Weekday							Weekend			
			AM			PM			Daily	SAT[3]			Daily
			In	Out	Total	In	Out	Total		In	Out	Total	
Multifamily Housing (Medium Rise)	DU	221	0.09	0.27	0.36	0.27	0.17	0.44	5.44	0.22	0.22	0.44	4.91
Retail	TSF	820	0.58	0.36	0.94	1.83	1.98	3.81	37.75	2.34	2.16	4.50	46.12

[1] Source: *2017 ITE Trip Generation Manual (10th Edition).*

[2] DU = Dwelling Units
TSF= Thousand Square Feet.

[3] ITE Saturday peak hour of generator trip rates utilized.

Table 4-2
Proposed Project Trip Generation[1]

Land Use (ITE Code)	Quantity	Units[2]	Weekday							Weekend			
			AM			PM			Daily	SAT			Daily
			In	Out	Total	In	Out	Total		In	Out	Total	
Multifamily Housing (Medium Rise) (221)	691	DU	65	184	249	185	119	304	3,759	149	155	304	3,393
Internal Trip Capture (5% AM, 5% PM, 5% Sat, 5% Daily)			-3	-9	-12	-9	-6	-15	-188	-7	-8	-15	-170
Subtotal Residential			***62***	***175***	***237***	***176***	***113***	***289***	***3,571***	***142***	***147***	***289***	***3,223***
Retail (820)	71.2	TSF	41	25	66	130	141	271	2,688	167	154	320	3,284
Internal Trip Capture (5% AM, 5% PM, 5% Sat, 5% Daily)			-2	-1	-3	-7	-7	-14	-134	-8	-8	-16	-164
Subtotal after Internal Trip Capture			39	24	63	123	134	257	2,554	159	146	304	3,120
Pass-by (0% AM, 34% PM, 34% SAT, 17% Daily)			0	0	0	-42	-46	-88	-434	-54	-50	-103	-530
Subtotal Retail			***39***	***24***	***63***	***81***	***88***	***169***	***2,120***	***105***	***96***	***201***	***2,590***
Project Trip Generation (Without Pass-by or Internal Capture)			***106***	***209***	***315***	***315***	***260***	***575***	***6,447***	***316***	***309***	***624***	***6,677***
Project Trip Generation With Internal Capture and Pass-By			***101***	***199***	***300***	***257***	***201***	***458***	***5,691***	***247***	***243***	***490***	***5,813***

[1] Source: *2017 ITE Trip Generation Manual (10th Edition).*

[2] DU = Dwelling Units
TSF= Thousand Square Feet.

Table 4-3
Cumulative Projects Trip Generation[1]

ID No.	Jurisdiction	Project Name / Case Number	Land Use	Quantity	Units[2]	Peak Hour									Daily
						AM			PM			SAT			
						In	Out	Total	In	Out	Total	In	Out	Total	
TAZ 1															
RC 1	**Rancho Cucamonga**	DRC2019-00371	General Office	12.000	TSF	12	2	14	2	12	14	3	3	6	117
RC 2	**Rancho Cucamonga**	DRC2018-00889	General Office	184.364	TSF	184	30	214	34	178	212	53	45	98	1,796
			Retail	15.811	TSF	9	6	15	29	31	60	50	50	100	597
TAZ 1 Total						**205**	**38**	**243**	**65**	**221**	**286**	**106**	**98**	**204**	**2,510**
TAZ 2															
RC 3	**Rancho Cucamonga**	DRC2017-00654	Multi-Family Housing (Low-Rise)	207	DU	22	73	95	73	43	116	72	72	145	1,515
			Retail	14.300	TSF	8	5	13	26	28	54	45	45	91	540
TAZ 2 Total						**30**	**78**	**108**	**99**	**71**	**170**	**117**	**117**	**236**	**2,055**
TAZ 3															
RC 4	**Rancho Cucamonga**	DRC2019-00766	Warehousing	143.014	TSF	19	6	25	7	20	27	5	3	7	249
RC 6	**Rancho Cucamonga**	DRC2020-00026	Warehousing	23.380	TSF	3	1	4	1	3	4	1	0	1	41
TAZ 3 Total						**22**	**7**	**29**	**8**	**23**	**31**	**6**	**3**	**8**	**290**
TAZ 4															
RC 5	**Rancho Cucamonga**	DRC2018-00529	Industrial	198.000	TSF	122	17	139	16	109	125	38	43	81	982
RC 7	**Rancho Cucamonga**	5th and Hermosa Warehouse	Warehousing	140.000	TSF	18	5	23	7	19	26	4	3	7	244
TAZ 4 Total						**140**	**22**	**162**	**23**	**128**	**151**	**42**	**46**	**88**	**1,226**
TAZ 5															
RC 8	**Rancho Cucamonga**	DRC2017-00925	Multi-Family Housing (Low-Rise)	296	DU	31	105	136	104	61	165	104	104	207	2,167
RC 9	**Rancho Cucamonga**	DRC2018-00784	Multi-Family Housing (Low-Rise)	135	DU	14	48	62	48	28	76	47	47	95	988
RC 10	**Rancho Cucamonga**	DRC2018-00851	Single Family Homes	80	DU	15	44	59	50	29	79	40	34	74	755
RC 11	**Rancho Cucamonga**	DRC2019-00674	Multi-Family Housing (Low-Rise)	867	DU	92	307	399	306	180	486	303	303	607	6,346
TAZ 5 Total						**152**	**504**	**656**	**508**	**298**	**806**	**494**	**488**	**983**	**10,256**
TAZ 6															
RC 12	**Rancho Cucamonga**	DRC2020-00212	High Cube Warehouse	2,200.000	TSF	136	40	176	62	158	220	132	132	264	3,080
TAZ 6 Total						**136**	**40**	**176**	**62**	**158**	**220**	**132**	**132**	**264**	**3,080**
TAZ 7															
O 1	**Ontario**	Top Golf - Recreation	Golf Course	13.800	ACRES	2	1	3	1	3	4	1	3	4	52
TAZ 7 Total						**2**	**1**	**3**	**1**	**3**	**4**	**1**	**3**	**4**	**52**
TAZ 8															
O 2	**Ontario**	File No. 21-013	Retail	91.163	TSF	53	33	86	167	181	348	289	289	579	3,441
TAZ 8 Total						**53**	**33**	**86**	**167**	**181**	**348**	**289**	**289**	**579**	**3,441**
TAZ 9															
O 3	**Ontario**	File No. PDEV19-054	Multi-Family Housing (Low-Rise)	72	DU	8	26	34	25	15	40	25	25	50	527
O 4	**Ontario**	File No. PDEV19-061	Multi-Family Housing (Low-Rise)	110	DU	12	39	51	39	23	62	39	39	77	805
TAZ 9 Total						**20**	**65**	**85**	**64**	**38**	**102**	**64**	**64**	**127**	**1,332**
TAZ 10															
O 5	**Ontario**	File No. PDEV21-021	Hotel	138	RM	38	27	65	42	41	83	39	39	77	1,154
TAZ 10 Total						**38**	**27**	**65**	**42**	**41**	**83**	**39**	**39**	**77**	**1,154**
TAZ 11															
O 6	**Ontario**	File No. PDEV19-024	Retail	329.850	TSF	192	118	310	603	653	1,256	1,047	1,047	2,095	12,452
TAZ 11 Total						**192**	**118**	**310**	**603**	**653**	**1,256**	**1,047**	**1,047**	**2,095**	**12,452**
TAZ 12															
O 7	**Ontario**	File No. PDEV19-067	Hotel	265	RM	73	51	124	81	78	159	74	74	148	2,215
O 8	**Ontario**	File No. PDEV17-016	Hotel	124	RM	34	24	58	38	36	74	35	35	69	1,037
TAZ 12 Total						**107**	**75**	**182**	**119**	**114**	**233**	**109**	**109**	**217**	**3,252**
TAZ 13															
O 9	**Ontario**	File No. PDEV20-008	High Cube Warehouse	200.000	TSF	12	4	16	6	14	20	12	12	24	280
O 10	**Ontario**	File No. PDEV21-018	Warehousing	168.000	TSF	22	7	29	9	23	32	5	3	8	292
TAZ 13 Total						**34**	**11**	**45**	**15**	**37**	**52**	**17**	**15**	**32**	**572**
Total Cumulative Projects Trip Generation						***1,131***	***1,019***	***2,150***	***1,776***	***1,966***	***3,742***	***2,463***	***2,450***	***4,914***	***41,672***

[1] Cumulative Projects information provided by the City of Ontario and the City of Rancho Cucamonga.

[2] TSF = Thousand Square Feet;
DU = Dwelling Units;
RM = Rooms.

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5.0 Study Intersection Peak Hour Level of Service Analysis

5.1 Existing Conditions Study Intersection Peak Hour LOS

Existing Conditions level of service (LOS) calculations for the study intersections are shown in Table 5-1 and are based upon the existing (2021) traffic volumes shown in Exhibit 3-2 and Exhibit 3-3, as well as the existing geometry shown in Exhibit 3-1.

As shown in Table 5-1, the study intersections are all currently operating at an acceptable LOS (LOS E or better) during the peak hours for Existing Conditions with exception of the following study intersection:

- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)
    - SAT Peak Hour – LOS F (82.4 secs)

Detailed LOS analysis sheets for Existing Conditions are contained in Appendix B.

5.2 Existing Plus Project Conditions Study Intersection Peak Hour LOS

Existing Plus Project Conditions level of service (LOS) calculations for the study intersections are shown in Table 5-2 and are based upon the Existing Plus Project Conditions traffic volumes shown in Exhibit 4-5 and Exhibit 4-6, as well as the existing geometry shown in Exhibit 3-1.

As shown in Table 5-2, the study intersections are all forecast to continue to operate at an acceptable LOS (LOS E or better) during the peak hours for Existing Plus Project Conditions with exception of the following study intersection:

- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)
    - SAT Peak Hour – LOS F (82.7 secs)

As also shown in Table 5-2, based on agency-established thresholds, the proposed project is required to contribute to improvements at the following study intersection for Existing Plus Project Conditions:

- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)

After review of the existing roadway conditions at this intersection, no feasible intersection improvements can be identified for this study intersection to achieve acceptable level of service (LOS E or better) for Existing Plus Project Conditions.

Detailed LOS analysis sheets for Existing Plus Project Conditions are contained in Appendix C.

5.3 Opening Year Without Related Projects Without Project Conditions Study Intersection Peak Hour LOS

Opening Year Without Related Projects Without Project Conditions level of service (LOS) calculations for the study intersections are shown in Table 5-3 and are based upon the Opening Year Without Related Projects Without Project Conditions traffic volumes shown in Exhibit 4-10 and Exhibit 4-11, as well as the existing geometry shown in Exhibit 3-1.

As shown in Table 5-3, the study intersections are all forecast to continue to operate at an acceptable LOS (LOS E or better) during the peak hours for Opening Year Without Related Projects Without Project Conditions with exception of the following study intersection:

- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)
    - SAT Peak Hour – LOS F (90.4 secs)

Detailed LOS analysis sheets for Opening Year Without Related Projects Without Project Conditions are contained in Appendix D.

5.4 Opening Year Without Related Projects With Project Conditions Study Intersection Peak Hour LOS

Opening Year Without Related Projects With Project Conditions level of service (LOS) calculations for the study intersections are shown in Table 5-4 and are based upon the Opening Year Without Related Projects With Project Conditions traffic volumes shown in Exhibit 4-12 and Exhibit 4-13, as well as the existing geometry shown in Exhibit 3-1.

As shown in Table 5-4, the study intersections are all forecast to continue to operate at an acceptable LOS (LOS E or better) during the peak hours for Opening Year Without Related Projects With Project Conditions with exception of the following study intersection:

- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)
    - SAT Peak Hour – LOS F (90.8 secs)

As also shown in Table 5-4, based on agency-established thresholds, the proposed project is required to contribute to improvements at the following study intersection for Opening Year Without Related Projects With Project Conditions:

- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)

After review of the existing roadway conditions at this intersection, no feasible intersection improvements can be identified for this study intersection to achieve acceptable level of service (LOS E or better) for Opening Year Without Related Projects With Project Conditions.

Detailed LOS analysis sheets for Opening Year Without Related Projects With Project Conditions are contained in Appendix E.

5.5 Opening Year With Related Projects Without Project Conditions Study Intersection Peak Hour LOS

Opening Year With Related Projects Without Project Conditions level of service (LOS) calculations for the study intersections are shown in Table 5-5 and are based upon the Opening Year With Related Projects Without Project Conditions traffic volumes shown in Exhibit 4-14 and Exhibit 4-15, as well as the existing geometry shown in Exhibit 3-1.

As shown in Table 5-5, the study intersections are all forecast to continue to operate at an acceptable LOS (LOS E or better) during the peak hours for Opening Year With Related Projects Without Project Conditions with exception to the following study intersection:

- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)
    - PM Peak Hour – LOS F (94.4 secs)

- SAT Peak Hour – LOS F (113.9 secs)

Detailed LOS analysis sheets for Opening Year With Related Projects Without Project Conditions are contained in Appendix F.

5.6 Opening Year With Related Projects With Project Conditions Study Intersection Peak Hour LOS

Opening Year With Related Projects With Project Conditions level of service (LOS) calculations for the study intersections are shown in Table 5-6 and are based upon the Opening Year With Related Projects With Project Conditions traffic volumes shown in Exhibit 4-16 and Exhibit 4-17, as well as the existing geometry shown in Exhibit 3-1.

As shown in Table 5-6, the study intersections are all forecast to continue to operate at an acceptable LOS (LOS E or better) during the peak hours for Opening Year With Related Projects With Project Conditions with exception to the following study intersections:

- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)
  - PM Peak Hour – LOS F (97.0 secs)
  - SAT Peak Hour – LOS F (116.1 secs)

As also shown in Table 5-6, based on agency-established thresholds, the proposed project is required to contribute to improvements at the following study intersection for Opening Year With Related Projects With Project Conditions:

- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)

After review of the existing roadway conditions at this intersection, no feasible intersection improvements can be identified for this study intersection to achieve acceptable level of service (LOS E or better) for Opening Year With Related Projects With Project Conditions.

Detailed LOS analysis sheets for Opening Year With Related Projects With Project Conditions are contained in Appendix G.

5.7 Horizon Year (2040) Without Project Conditions Study Intersection Peak Hour LOS

Horizon Year (2040) Without Project Conditions level of service (LOS) calculations for the study intersections are shown in Table 5-7 and are based upon the weekday and Saturday Opening Year With Related Projects Without Project Conditions traffic volumes shown in Exhibit 4-18 and Exhibit 4-19, as well as the existing geometry shown in Exhibit 3-1.

As shown in Table 5-7, the study intersections are all forecast to continue to operate at an acceptable LOS (LOS E or better) during the peak hours for Horizon Year (2040) Without Project Conditions with exception to the following study intersection:

- **Int #1:** Haven Avenue (NS) / 4th Street (EW)
    - PM Peak Hour – LOS F (98.0 secs)
- **Int #4:** Project Access 3 (NS) / 4th Street (EW)
    - PM Peak Hour – LOS F (51.9 secs)
- **Int #5:** Milliken Avenue (NS) / 4th Street (EW)
    - PM Peak Hour – LOS F (103.9 secs)
- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)
    - AM Peak Hour LOS – F (118.2 secs)
    - PM Peak Hour – LOS F (149.3 secs)
    - SAT Peak Hour – LOS F (180.2 secs)
- **Int #11:** Haven Avenue (NS) / Inland Empire Boulevard (EW)
    - PM Peak Hour LOS – F (134.7 secs)

- **Int #14:** Milliken Avenue (NS) / Ontario Mills Parkway – I-10 WB Ramps (EW)

    - SAT Peak Hour – LOS F (82.2 secs)

Detailed LOS analysis sheets for Horizon Year (2040) Without Project Conditions are contained in Appendix H.

5.8 Horizon Year (2040) With Project Conditions Study Intersection Peak Hour LOS

Horizon Year (2040) With Project Conditions level of service (LOS) calculations for the study intersections are shown in Table 5-8 and are based upon the weekday and Saturday Horizon Year (2040) With Project Conditions traffic volumes shown in Exhibit 4-20 and Exhibit 4-21, as well as the existing geometry shown in Exhibit 3-1.

As shown in Table 5-8, the study intersections are all forecast to continue to operate at an acceptable LOS (LOS E or better) during the peak hours for Horizon Year (2040) With Project Conditions with exception to the following study intersections:

- **Int #1:** Haven Avenue (NS) / 4th Street (EW)

    - PM Peak Hour – LOS F (102.3 secs)

- **Int #4** Project Access 3 (NS) / 4th Street (EW)

    - PM Peak Hour – LOS F (73.8 secs)

- **Int #5:** Milliken Avenue (NS) / 4th Street (EW)

    - PM Peak Hour – LOS F (109.7 secs)

- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)

    - AM Peak Hour LOS – F (119.0 secs)

    - PM Peak Hour – LOS F (152.9 secs)

    - SAT Peak Hour – LOS F (184.8 secs)

- **Int #11:** Haven Avenue (NS) / Inland Empire Boulevard (EW)
    - PM Peak Hour LOS – F (136.5 secs)
- **Int #14:** Milliken Avenue (NS) / Ontario Mills Parkway – I-10 WB Ramps (EW)
    - SAT Peak Hour – LOS F (87.3 secs)

As also shown in Table 5-8, based on agency-established thresholds, the proposed project is required to contribute to improvements at the following study intersection for Horizon Year (2040) With Project Conditions:

- **Int #1:** Haven Avenue (NS) / 4th Street (EW)
- **Int #4:** Project Access 3 (NS) / 4th Street (EW)
- **Int #5:** Milliken Avenue (NS) / 4th Street (EW)
- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)
- **Int #11:** Haven Avenue (NS) / Inland Empire Boulevard (EW)
- **Int #14:** Milliken Avenue (NS) / Ontario Mills Parkway – I-10 WB Ramps (EW)

After review of the existing roadway conditions at these study intersections, no feasible intersection improvements can be identified for the following study intersections to achieve acceptable level of service (LOS E or better) for Horizon Year (2040) With Project Conditions.

- **Int #1:** Haven Avenue (NS) / 4th Street (EW)
- **Int #4:** Project Access 3 (NS) / 4th Street (EW)
- **Int #5:** Milliken Avenue (NS) / 4th Street (EW)
- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)

- **Int #11:** Haven Avenue (NS) / Inland Empire Boulevard (EW)

The following recommended improvements are identified to restore the intersection of *Milliken Avenue / Ontario Mills Parkway – I-10 WB Ramps* to acceptable conditions (LOS E for Horizon Year (2040) With Project Conditions:

Intersection Improvement #1	**Int 14 – Milliken Avenue / Ontario Mills Parkway – I-10 WB Ramps:** Make a fair-share contribution to widen the eastbound off-ramp approach from two left turn lanes, one through lane and one right turn lane to **three** left turn lanes, one through lane, and one right turn lane.

Detailed LOS analysis sheets for Horizon Year (2040) With Project Conditions are contained in Appendix I.

Detailed LOS analysis sheets for Horizon Year (2040) With Project Conditions With Improvements are contained in Appendix J.

Table 5-1
Study Intersection LOS Analysis Summary
Existing Conditions

	Intersection	Traffic Control[3]	Delay (Secs)[1,2]			Level of Service		
			AM	PM	SAT	AM	PM	SAT
1.	Haven Avenue (NS) / 4th Street (EW)	TS	29.3	46.0	27.4	C	D	C
2.	Cleveland Avenue - Via Asti (NS) / 4th Street (EW)	TS	10.2	9.4	7.9	B	A	A
3.	Resort Parkway - Via Piemonte (NS) / 4th Street (EW)	TS	7.9	6.7	7.5	A	A	A
4.	Project Access 3 (NS) / 4th Street (EW)	CSS	11.0	23.2	15.0	B	C	B
5.	Milliken Avenue (NS) / 4th Street (EW)	TS	27.4	48.1	39.7	C	D	D
6.	I-15 SB Ramps - Ontario Mills Drive (NS) / 4th Street (EW)	TS	49.3	67.1	**82.4**	D	E	**F**
7.	I-15 NB Ramps (NS) / 4th Street (EW)	TS	21.1	32.5	29.7	C	C	C
8.	Haven Avenue (NS) / Concours Street (EW)	TS	14.5	13.0	12.0	B	B	B
9.	Concours Street (NS) / Ontario Center Parkway (EW)	TS	8.0	7.7	4.4	A	A	A
10.	Milliken Avenue (NS) / Concours Street (EW)	TS	13.3	20.2	19.7	B	C	B
11.	Haven Avenue (NS) / Inland Empire Boulevard (EW)	TS	21.4	53.3	19.6	C	D	B
12.	Milliken Avenue (NS) / Inland Empire Boulevard (EW)	TS	15.3	22.9	25.2	B	C	C
13.	Haven Avenue (NS) / I-10 WB Ramps (EW)	TS	21.6	9.5	8.0	C	A	A
14.	Milliken Avenue (NS) / Ontario Mills Parkway - I-10 WB Ramps (EW)	TS	21.2	36.0	38.4	C	D	D
15.	Haven Avenue (NS) / I-10 EB Ramps (EW)	TS	24.8	9.6	12.9	C	A	B
16.	Milliken Avenue (NS) / I-10 EB Ramps (EW)	TS	15.1	11.6	13.1	B	B	B

[1] Deficient operation shown in **Bold**.

[2] HCM Analysis Software: Synchro, Version 10.0. Per the Highway Capacity Manual 6th Edition, overall average intersection delay and level of service are shown for intersections with traffic signal or all-way stop control. For intersections with cross-street stop control, the delay and level of service for the worst

[3] TS = Traffic Signal

CSS = Cross-Street Stop

Table 5-2
Study Intersection LOS Analysis Summary
Existing Plus Project Conditions

	Intersection	Traffic Control[3]	Existing Conditions						Existing Plus Project Conditions											
			Delay (Secs)[1,2]			Level of Service			Delay (Secs)[1,2]			Increase in Delay			Level of Service			Requires Improvement?		
			AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
1.	Haven Avenue (NS) / 4th Street (EW)	TS	29.3	46.0	27.4	C	D	C	30.3	48.6	29.6	1.0	2.6	2.2	C	D	C	NO	NO	NO
2.	Cleveland Avenue - Via Asti (NS) / 4th Street (EW)	TS	10.2	9.4	7.9	B	A	A	11.4	10.1	9.4	1.2	0.7	1.5	B	B	A	NO	NO	NO
3.	Resort Parkway - Via Piemonte (NS) / 4th Street (EW)	TS	7.9	6.7	7.5	A	A	A	8.3	8.0	8.3	0.4	1.3	0.8	A	A	A	NO	NO	NO
4.	Project Access 3 (NS) / 4th Street (EW)	CSS	11.0	23.2	15.0	B	C	B	11.3	26.4	16.3	0.3	3.2	1.3	B	D	C	NO	NO	NO
5.	Milliken Avenue (NS) / 4th Street (EW)	TS	27.4	48.1	39.7	C	D	D	27.7	49.9	41.6	0.3	1.8	1.9	C	D	D	NO	NO	NO
6.	I-15 SB Ramps - Ontario Mills Drive (NS) / 4th Street (EW)	TS	49.3	67.1	**82.4**	D	E	**F**	50.1	67.7	**82.7**	0.8	0.6	**0.3**	D	E	**F**	NO	NO	**YES**
7.	I-15 NB Ramps (NS) / 4th Street (EW)	TS	21.1	32.5	29.7	C	C	C	21.5	34.0	31.2	0.4	1.5	1.5	C	C	C	NO	NO	NO
8.	Haven Avenue (NS) / Concours Street (EW)	TS	14.5	13.0	12.0	B	B	B	14.5	13.0	12.1	0.0	0.0	0.1	B	B	B	NO	NO	NO
9.	Concours Street (NS) / Ontario Center Parkway (EW)	TS	8.0	7.7	4.4	A	A	A	10.1	10.3	7.1	2.1	2.6	2.7	B	B	A	NO	NO	NO
10.	Milliken Avenue (NS) / Concours Street (EW)	TS	13.3	20.2	19.7	B	C	B	14.1	21.9	21.3	0.8	1.7	1.6	B	C	C	NO	NO	NO
11.	Haven Avenue (NS) / Inland Empire Boulevard (EW)	TS	21.4	53.3	19.6	C	D	B	21.5	53.6	19.7	0.1	0.3	0.1	C	D	B	NO	NO	NO
12.	Milliken Avenue (NS) / Inland Empire Boulevard (EW)	TS	15.3	22.9	25.2	B	C	C	15.5	23.2	25.6	0.2	0.3	0.4	B	C	C	NO	NO	NO
13.	Haven Avenue (NS) / I-10 WB Ramps (EW)	TS	21.6	9.5	8.0	C	A	A	21.7	9.5	8.0	0.1	0.0	0.0	C	A	A	NO	NO	NO
14.	Milliken Avenue (NS) / Ontario Mills Parkway - I-10 WB Ramps (EW)	TS	21.2	36.0	38.4	C	D	D	21.7	38.8	40.9	0.5	2.8	2.5	C	D	D	NO	NO	NO
15.	Haven Avenue (NS) / I-10 EB Ramps (EW)	TS	24.8	9.6	12.9	C	A	B	25.2	10.0	13.2	0.4	0.4	0.3	C	A	B	NO	NO	NO
16.	Milliken Avenue (NS) / I-10 EB Ramps (EW)	TS	15.1	11.6	13.1	B	B	B	15.1	11.9	13.5	0.0	0.3	0.4	B	B	B	NO	NO	NO

[1] Deficient operation shown in **Bold**.

[2] HCM Analysis Software: Synchro, Version 10.0. Per the Highway Capacity Manual 6th Edition, overall average intersection delay and level of service are shown for intersections with traffic signal or all-way stop control. For intersections with cross-street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal
CSS = Cross-Street Stop

Table 5-3
Study Intersection LOS Analysis Summary
Project Opening Year Without Related Projects Without Project Conditions

	Intersection	Traffic Control[3]	Delay (Secs)[1,2]			Level of Service		
			AM	PM	SAT	AM	PM	SAT
1.	Haven Avenue (NS) / 4th Street (EW)	TS	30.4	49.0	28.3	C	D	C
2.	Cleveland Avenue - Via Asti (NS) / 4th Street (EW)	TS	10.1	9.4	7.8	B	A	A
3.	Resort Parkway - Via Piemonte (NS) / 4th Street (EW)	TS	7.9	6.8	7.5	A	A	A
4.	Project Access 3 (NS) / 4th Street (EW)	CSS	11.1	24.5	15.5	B	C	C
5.	Milliken Avenue (NS) / 4th Street (EW)	TS	28.9	51.6	42.4	C	D	D
6.	I-15 SB Ramps - Ontario Mills Drive (NS) / 4th Street (EW)	TS	54.4	73.7	**90.4**	D	E	**F**
7.	I-15 NB Ramps (NS) / 4th Street (EW)	TS	22.0	35.1	31.6	C	D	C
8.	Haven Avenue (NS) / Concours Street (EW)	TS	14.9	13.5	12.2	B	B	B
9.	Concours Street (NS) / Ontario Center Parkway (EW)	TS	8.0	7.8	4.4	A	A	A
10.	Milliken Avenue (NS) / Concours Street (EW)	TS	13.5	20.8	20.2	B	C	C
11.	Haven Avenue (NS) / Inland Empire Boulevard (EW)	TS	22.4	58.6	20.4	C	E	C
12.	Milliken Avenue (NS) / Inland Empire Boulevard (EW)	TS	15.6	23.9	26.6	B	C	C
13.	Haven Avenue (NS) / I-10 WB Ramps (EW)	TS	23.3	10.0	8.3	C	A	A
14.	Milliken Avenue (NS) / Ontario Mills Parkway - I-10 WB Ramps (EW)	TS	22.0	38.3	41.2	C	D	D
15.	Haven Avenue (NS) / I-10 EB Ramps (EW)	TS	27.4	10.2	13.7	C	B	B
16.	Milliken Avenue (NS) / I-10 EB Ramps (EW)	TS	15.9	12.1	13.8	B	B	B

[1] Deficient operation shown in **Bold**.

[2] HCM Analysis Software: Synchro, Version 10.0. Per the Highway Capacity Manual 6th Edition, overall average intersection delay and level of service are shown for intersections with traffic signal or all-way stop control. For intersections with cross-street stop control, the delay and level of service for the worst

[3] TS = Traffic Signal

CSS = Cross-Street Stop

Table 5-4
Study Intersection LOS Analysis Summary
Project Opening Year Without Related Projects With Project Conditions

	Intersection	Traffic Control[3]	Project Opening Year Without Related Projects Without Project Conditions						Project Opening Year Without Related Projects With Project Conditions											
			Delay (Secs)[1,2]			Level of Service			Delay (Secs)[1,2]			Increase in Delay			Level of Service			Requires Improvement?[1]		
			AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
1.	Haven Avenue (NS) / 4th Street (EW)	TS	30.4	49.0	28.3	C	D	C	31.4	51.8	30.6	1.0	2.8	2.3	C	D	C	NO	NO	NO
2.	Cleveland Avenue - Via Asti (NS) / 4th Street (EW)	TS	10.1	9.4	7.8	B	A	A	11.3	10.1	9.4	1.2	0.7	1.6	B	B	A	NO	NO	NO
3.	Resort Parkway - Via Piemonte (NS) / 4th Street (EW)	TS	7.9	6.8	7.5	A	A	A	8.3	8.0	8.3	0.4	1.2	0.8	A	A	A	NO	NO	NO
4.	Project Access 3 (NS) / 4th Street (EW)	CSS	11.1	24.5	15.5	B	C	C	11.4	28.3	16.8	0.3	3.8	1.3	B	D	C	NO	NO	NO
5.	Milliken Avenue (NS) / 4th Street (EW)	TS	28.9	51.6	42.4	C	D	D	29.2	53.6	44.2	0.3	2.0	1.8	C	D	D	NO	NO	NO
6.	I-15 SB Ramps - Ontario Mills Drive (NS) / 4th Street (EW)	TS	54.4	73.7	**90.4**	D	E	**F**	55.3	74.6	**90.8**	0.9	0.9	**0.4**	E	E	**F**	NO	NO	**YES**
7.	I-15 NB Ramps (NS) / 4th Street (EW)	TS	22.0	35.1	31.6	C	D	C	22.4	36.8	33.3	0.4	1.7	1.7	C	D	C	NO	NO	NO
8.	Haven Avenue (NS) / Concours Street (EW)	TS	14.9	13.5	12.2	B	B	B	14.9	13.5	12.2	0.0	0.0	0.0	B	B	B	NO	NO	NO
9.	Concours Street (NS) / Ontario Center Parkway (EW)	TS	8.0	7.8	4.4	A	A	A	10.1	10.4	7.0	2.1	2.6	2.6	B	B	A	NO	NO	NO
10.	Milliken Avenue (NS) / Concours Street (EW)	TS	13.5	20.8	20.2	B	C	C	14.2	22.7	21.8	0.7	1.9	1.6	B	C	C	NO	NO	NO
11.	Haven Avenue (NS) / Inland Empire Boulevard (EW)	TS	22.4	58.6	20.4	C	E	C	22.5	59.0	20.6	0.1	0.4	0.2	C	E	C	NO	NO	NO
12.	Milliken Avenue (NS) / Inland Empire Boulevard (EW)	TS	15.6	23.9	26.6	B	C	C	15.7	24.2	27.1	0.1	0.3	0.5	B	C	C	NO	NO	NO
13.	Haven Avenue (NS) / I-10 WB Ramps (EW)	TS	23.3	10.0	8.3	C	A	A	23.4	10.0	8.3	0.1	0.0	0.0	C	A	A	NO	NO	NO
14.	Milliken Avenue (NS) / Ontario Mills Parkway - I-10 WB Ramps (EW)	TS	22.0	38.3	41.2	C	D	D	22.6	41.5	43.8	0.6	3.2	2.6	C	D	D	NO	NO	NO
15.	Haven Avenue (NS) / I-10 EB Ramps (EW)	TS	27.4	10.2	13.7	C	B	B	27.8	10.6	14.0	0.4	0.4	0.3	C	B	B	NO	NO	NO
16.	Milliken Avenue (NS) / I-10 EB Ramps (EW)	TS	15.9	12.1	13.8	B	B	B	15.9	12.4	14.1	0.0	0.3	0.3	B	B	B	NO	NO	NO

[1] Deficient operation shown in **Bold**.

[2] HCM Analysis Software: Synchro, Version 10.0. Per the Highway Capacity Manual 6th Edition, overall average intersection delay and level of service are shown for intersections with traffic signal or all-way stop control. For intersections with cross-street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal
CSS = Cross-Street Stop

Table 5-5
Study Intersection LOS Analysis Summary
Project Opening Year With Related Projects Without Project Conditions

	Intersection	Traffic Control[3]	Delay (Secs)[1,2]			Level of Service		
			AM	PM	SAT	AM	PM	SAT
1.	Haven Avenue (NS) / 4th Street (EW)	TS	33.3	66.6	38.9	C	E	D
2.	Cleveland Avenue - Via Asti (NS) / 4th Street (EW)	TS	14.8	12.7	11.7	B	B	B
3.	Resort Parkway - Via Piemonte (NS) / 4th Street (EW)	TS	7.8	6.9	7.5	A	A	A
4.	Project Access 3 (NS) / 4th Street (EW)	CSS	12.3	30.0	18.9	B	D	C
5.	Milliken Avenue (NS) / 4th Street (EW)	TS	33.1	62.9	54.9	C	E	D
6.	I-15 SB Ramps - Ontario Mills Drive (NS) / 4th Street (EW)	TS	67.8	**94.4**	**113.9**	E	**F**	**F**
7.	I-15 NB Ramps (NS) / 4th Street (EW)	TS	24.8	54.3	54.0	C	D	D
8.	Haven Avenue (NS) / Concours Street (EW)	TS	16.4	17.8	16.3	B	B	B
9.	Concours Street (NS) / Ontario Center Parkway (EW)	TS	8.0	7.8	4.4	A	A	A
10.	Milliken Avenue (NS) / Concours Street (EW)	TS	14.2	22.2	21.6	B	C	C
11.	Haven Avenue (NS) / Inland Empire Boulevard (EW)	TS	24.6	74.6	25.8	C	E	C
12.	Milliken Avenue (NS) / Inland Empire Boulevard (EW)	TS	16.7	25.3	28.4	B	C	C
13.	Haven Avenue (NS) / I-10 WB Ramps (EW)	TS	25.7	10.7	8.8	C	B	A
14.	Milliken Avenue (NS) / Ontario Mills Parkway - I-10 WB Ramps (EW)	TS	23.4	45.0	48.4	C	D	D
15.	Haven Avenue (NS) / I-10 EB Ramps (EW)	TS	30.1	12.0	15.4	C	B	B
16.	Milliken Avenue (NS) / I-10 EB Ramps (EW)	TS	15.8	12.8	14.4	B	B	B

[1] Deficient operation shown in **Bold**.

[2] HCM Analysis Software: Synchro, Version 10.0. Per the Highway Capacity Manual 6th Edition, overall average intersection delay and level of service are shown for intersections with traffic signal or all-way stop control. For intersections with cross-street stop control, the delay and level of service for the worst

[3] TS = Traffic Signal

CSS = Cross-Street Stop

Table 5-6
Study Intersection LOS Analysis Summary
Project Opening Year With Related Projects With Project Conditions

	Intersection	Traffic Control[3]	Project Opening Year With Related Projects Without Project Conditions						Project Opening Year With Related Projects With Project Conditions											
			Delay (Secs)[1,2]			Level of Service			Delay (Secs)[1,2]			Increase in Delay			Level of Service			Requires Improvement?		
			AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
1.	Haven Avenue (NS) / 4th Street (EW)	TS	33.3	66.6	38.9	C	E	D	35.0	71.9	42.8	1.7	5.3	3.9	C	E	D	NO	NO	NO
2.	Cleveland Avenue - Via Asti (NS) / 4th Street (EW)	TS	14.8	12.7	11.7	B	B	B	15.0	13.3	12.2	0.2	0.6	0.5	B	B	B	NO	NO	NO
3.	Resort Parkway - Via Piemonte (NS) / 4th Street (EW)	TS	7.8	6.9	7.5	A	A	A	8.2	8.2	8.3	0.4	1.3	0.8	A	A	A	NO	NO	NO
4.	Project Access 3 (NS) / 4th Street (EW)	CSS	12.3	30.0	18.9	B	D	C	12.8	36.0	21.1	0.5	6.0	2.2	B	E	C	NO	NO	NO
5.	Milliken Avenue (NS) / 4th Street (EW)	TS	33.1	62.9	54.9	C	E	D	33.4	66.5	57.1	0.3	3.6	2.2	C	E	E	NO	NO	NO
6.	I-15 SB Ramps - Ontario Mills Drive (NS) / 4th Street (EW)	TS	67.8	**94.4**	**113.9**	E	**F**	**F**	68.9	**97.0**	**116.1**	1.1	**2.6**	**2.2**	E	**F**	**F**	NO	**YES**	**YES**
7.	I-15 NB Ramps (NS) / 4th Street (EW)	TS	24.8	54.3	54.0	C	D	D	25.1	58.4	58.8	0.3	4.1	4.8	C	E	E	NO	NO	NO
8.	Haven Avenue (NS) / Concours Street (EW)	TS	16.4	17.8	16.3	B	B	B	16.4	17.8	16.3	0.0	0.0	0.0	B	B	B	NO	NO	NO
9.	Concours Street (NS) / Ontario Center Parkway (EW)	TS	8.0	7.8	4.4	A	A	A	10.1	10.5	7.1	2.1	2.7	2.7	B	B	A	NO	NO	NO
10.	Milliken Avenue (NS) / Concours Street (EW)	TS	14.2	22.2	21.6	B	C	C	15.0	24.3	23.3	0.8	2.1	1.7	B	C	C	NO	NO	NO
11.	Haven Avenue (NS) / Inland Empire Boulevard (EW)	TS	24.6	74.6	25.8	C	E	C	24.8	75.7	25.9	0.2	1.1	0.1	C	E	C	NO	NO	NO
12.	Milliken Avenue (NS) / Inland Empire Boulevard (EW)	TS	16.7	25.3	28.4	B	C	C	16.8	25.7	29.0	0.1	0.4	0.6	B	C	C	NO	NO	NO
13.	Haven Avenue (NS) / I-10 WB Ramps (EW)	TS	25.7	10.7	8.8	C	B	A	25.8	10.7	8.8	0.1	0.0	0.0	C	B	A	NO	NO	NO
14.	Milliken Avenue (NS) / Ontario Mills Parkway - I-10 WB Ramps (EW)	TS	23.4	45.0	48.4	C	D	D	24.1	48.8	54.3	0.7	3.8	5.9	C	D	D	NO	NO	NO
15.	Haven Avenue (NS) / I-10 EB Ramps (EW)	TS	30.1	12.0	15.4	C	B	B	30.5	12.7	15.6	0.4	0.7	0.2	C	B	B	NO	NO	NO
16.	Milliken Avenue (NS) / I-10 EB Ramps (EW)	TS	15.8	12.8	14.4	B	B	B	16.1	13.5	14.7	0.3	0.7	0.3	B	B	B	NO	NO	NO

[1] Deficient operation shown in **Bold**.

[2] HCM Analysis Software: Synchro, Version 10.0. Per the Highway Capacity Manual 6th Edition, overall average intersection delay and level of service are shown for intersections with traffic signal or all-way stop control. For intersections with cross-street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal
CSS = Cross-Street Stop

Table 5-7
Study Intersection LOS Analysis Summary
Horizon Year (2040) Without Project Conditions

	Intersection	Traffic Control[3]	Delay (Secs)[1,2]			Level of Service		
			AM	PM	SAT	AM	PM	SAT
1.	Haven Avenue (NS) / 4th Street (EW)	TS	43.1	**98.0**	43.7	D	**F**	D
2.	Cleveland Avenue - Via Asti (NS) / 4th Street (EW)	TS	14.8	13.6	11.8	B	B	B
3.	Resort Parkway - Via Piemonte (NS) / 4th Street (EW)	TS	7.8	7.5	7.5	A	A	A
4.	Project Access 3 (NS) / 4th Street (EW)	CSS	12.4	**51.9**	21.1	B	**F**	C
5.	Milliken Avenue (NS) / 4th Street (EW)	TS	43.9	**103.9**	71.0	D	**F**	E
6.	I-15 SB Ramps - Ontario Mills Drive (NS) / 4th Street (EW)	TS	**118.2**	**149.3**	**180.2**	**F**	**F**	**F**
7.	I-15 NB Ramps (NS) / 4th Street (EW)	TS	58.9	73.5	75.9	E	E	E
8.	Haven Avenue (NS) / Concours Street (EW)	TS	20.4	21.6	17.2	C	C	B
9.	Concours Street (NS) / Ontario Center Parkway (EW)	TS	7.9	9.3	4.4	A	A	A
10.	Milliken Avenue (NS) / Concours Street (EW)	TS	15.4	28.4	26.9	B	C	C
11.	Haven Avenue (NS) / Inland Empire Boulevard (EW)	TS	39.9	**134.7**	28.9	D	**F**	C
12.	Milliken Avenue (NS) / Inland Empire Boulevard (EW)	TS	18.8	38.2	42.3	B	D	D
13.	Haven Avenue (NS) / I-10 WB Ramps (EW)	TS	56.4	17.3	11.5	E	B	B
14.	Milliken Avenue (NS) / Ontario Mills Parkway - I-10 WB Ramps (EW)	TS	31.4	71.4	**82.2**	C	E	**F**
15.	Haven Avenue (NS) / I-10 EB Ramps (EW)	TS	64.6	16.7	23.6	E	B	C
16.	Milliken Avenue (NS) / I-10 EB Ramps (EW)	TS	26.9	17.3	20.6	C	B	C

[1] Deficient operation shown in **Bold**.

[2] HCM Analysis Software: Synchro, Version 10.0. Per the Highway Capacity Manual 6th Edition, overall average intersection delay and level of service are shown for intersections with traffic signal or all-way stop control. For intersections with cross-street stop control, the delay and level of service for the worst

[3] TS = Traffic Signal

CSS = Cross-Street Stop

Table 5-8
Study Intersection LOS Analysis Summary
Horizon Year (2040) With Project Conditions

	Intersection	Traffic Control[3]	Horizon Year (2040) Without Project Conditions						Horizon Year (2040) With Project Conditions											
			Delay (Secs)[1,2]			Level of Service			Delay (Secs)[1,2]			Increase in Delay			Level of Service			Requires Improvement?		
			AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
1.	Haven Avenue (NS) / 4th Street (EW)	TS	43.1	**98.0**	43.7	D	**F**	D	45.0	**102.3**	46.8	1.9	4.3	3.1	D	**F**	D	NO	**YES**	NO
2.	Cleveland Avenue - Via Asti (NS) / 4th Street (EW)	TS	14.8	13.6	11.8	B	B	B	15.0	14.2	12.3	0.2	0.6	0.5	B	B	B	NO	NO	NO
3.	Resort Parkway - Via Piemonte (NS) / 4th Street (EW)	TS	7.8	7.5	7.5	A	A	A	8.2	9.6	8.4	0.4	2.1	0.9	A	A	A	NO	NO	NO
4.	Project Access 3 (NS) / 4th Street (EW)	CSS	12.4	**51.9**	21.1	B	**F**	C	12.8	**73.8**	24.3	0.4	21.9	3.2	B	**F**	C	NO	**YES**	NO
5.	Milliken Avenue (NS) / 4th Street (EW)	TS	43.9	**103.9**	71.0	D	**F**	E	44.5	**109.7**	74.5	0.6	5.8	3.5	D	**F**	E	NO	**YES**	NO
6.	I-15 SB Ramps - Ontario Mills Drive (NS) / 4th Street (EW)	TS	**118.2**	**149.3**	**180.2**	**F**	**F**	**F**	**119.0**	**152.9**	**184.8**	0.8	3.6	4.6	**F**	**F**	**F**	**YES**	**YES**	**YES**
7.	I-15 NB Ramps (NS) / 4th Street (EW)	TS	58.9	73.5	75.9	E	E	E	59.9	78.7	77.9	1.0	5.2	2.0	E	E	E	NO	NO	NO
8.	Haven Avenue (NS) / Concours Street (EW)	TS	20.4	21.6	17.2	C	C	B	20.5	21.7	17.3	0.1	0.1	0.1	C	C	B	NO	NO	NO
9.	Concours Street (NS) / Ontario Center Parkway (EW)	TS	7.9	9.3	4.4	A	A	A	10.2	12.6	6.8	2.3	3.3	2.4	B	B	A	NO	NO	NO
10.	Milliken Avenue (NS) / Concours Street (EW)	TS	15.4	28.4	26.9	B	C	C	16.1	31.1	28.8	0.7	2.7	1.9	B	C	C	NO	NO	NO
11.	Haven Avenue (NS) / Inland Empire Boulevard (EW)	TS	39.9	**134.7**	28.9	D	**F**	C	41.1	**136.5**	29.2	1.2	1.8	0.3	D	**F**	C	NO	**YES**	NO
12.	Milliken Avenue (NS) / Inland Empire Boulevard (EW)	TS	18.8	38.2	42.3	B	D	D	19.0	38.9	43.1	0.2	0.7	0.8	B	D	D	NO	NO	NO
13.	Haven Avenue (NS) / I-10 WB Ramps (EW)	TS	56.4	17.3	11.5	E	B	B	57.0	17.5	11.6	0.6	0.2	0.1	E	B	B	NO	NO	NO
14.	Milliken Avenue (NS) / Ontario Mills Parkway - I-10 WB Ramps (EW)	TS	31.4	71.4	**82.2**	C	E	**F**	32.4	77.1	**87.3**	1.0	5.7	5.1	C	E	**F**	NO	NO	**YES**
	With Improvements	TS	- -	- -	- -	- -	- -	- -	27.0	55.6	77.3	-4.4	-15.8	-4.9	C	E	E	NO	NO	NO
15.	Haven Avenue (NS) / I-10 EB Ramps (EW)	TS	64.6	16.7	23.6	E	B	C	65.6	17.2	24.3	1.0	0.5	0.7	E	B	C	NO	NO	NO
16.	Milliken Avenue (NS) / I-10 EB Ramps (EW)	TS	26.9	17.3	20.6	C	B	C	32.3	18.4	20.9	5.4	1.1	0.3	C	B	C	NO	NO	NO

[1] Deficient operation shown in **Bold**.

[2] HCM Analysis Software: Synchro, Version 10.0. Per the Highway Capacity Manual 6th Edition, overall average intersection delay and level of service are shown for intersections with traffic signal or all-way stop control. For intersections with cross-street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal
CSS = Cross-Street Stop

6.0 CEQA Vehicle Miles Traveled (VMT) Analysis

In response to Senate Bill (SB) 743, the California Natural Resource Agency certified and adopted new CEQA Guidelines in December 2018 which now identify Vehicle Miles Traveled (VMT) as the most appropriate metric to evaluate a project's transportation impact under CEQA (§ 15064.3).

Effective July 1, 2020, the previous CEQA metric of LOS, typically measured in terms of automobile delay, roadway capacity and congestion, generally will no longer constitute a significant environmental impact.

The City of Ontario has adopted guidelines to provide recommendations in the form of and methodology and thresholds of significance for identifying VMT related impacts. The proposed project is subject to a VMT analysis and will adhere to the recommendations and practices described in the *City of Ontario Planning Commission Resolution No. PC20-021 (May 26, 2020).*

Based on the analysis methodology described in the City of Ontario's adopted Planning Commission Resolution regarding VMT, project screening procedures have been implemented to identify projects that may be presumed to have a less than significant impact absent substantial evidence to the contrary and will be exempted from further project-level VMT assessment.

According to the City's guidelines, land use projects located within a Transit Priority Area (TPA) and that have the following characteristics are presumed to have a less than significant impact absent substantial evidence to the contrary:

- Has a Floor Area Ratio of 0.75 or higher;
- Includes no more parking for residents, customers, or employees than the City Development Code mandates;
- Is consistent with the Sustainable Communities Strategy (SCS) as determined by the City with input from the Southern California Association of Governments (SCAG) or San Bernardino County Transportation Authority (SBCTA); and

- If there are existing affordable residential units, replaces those residential units with at least as many similarly affordable units and not with a smaller number of moderate or high-income residential units.

Based on the project site plan, the proposed project encompasses the following Assessor Parcel Numbers:

LOT	Assessor Parcel Number (APN)
LOT A & B	APN 021020501
LOT C	APN 021020438
LOT D	APN 021020439
LOT F	APN 021020412-15
LOT G	APN 021020420-25

Hence, the VMT analysis examined in this study focuses on the land use components from Lot A, Lot B, Lot C, and Lot D.

After utilizing the SBCTA VMT Screening Tool, all project parcels *with the exception of a portion of Parcel F* of the proposed project are located within a Transit Priority Area as shown in Exhibit 6-1 and are presumed to maintain the aforementioned characteristics.

The portion of Parcel F which is not within the TPA is not planned to consist of any trip-generating land uses as those portions of the site will only be used to relocate some of the existing parking capacity on the project site. Hence, those non-TPA areas are not subject to VMT analysis.

Additionally, the proposed project is expected to implement the following design features identified in the *Toyota Arena Mixed-Use Development Air Quality and Greenhouse Gas Impact Study, City of Ontario, California, June 4th, 2021.* The following project design features are trip reduction measures to reduce the number of auto-based trips and encourage the use of transit, bicycling, and walking:

1. Improve the walkability and design of the project by including pedestrian and bicycling connections within the project site and to adjacent off-site facilities (i.e. sidewalks, crosswalks, foot paths, protected bike lanes, multi-purpose trails, direct parcel-to-parcel connections, wayfinding signage, etc.)

2. Provide traffic calming measures (i.e. marked crosswalks, raised crosswalks, raised intersections, count-own signal timers, curb extensions, speed tables, median islands, tight corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, etc.)

3. Provide bicycle racks for the retail and commercial uses and secure bicycle parking areas for the office and residential uses.

It should be also noted that the SBCTA VMT Screening Tool additionally generates various project VMT metrics per traffic analysis zone (TAZ) such as:

- Productions and Attractions (PA) VMT Per Population
    - Residential VMT;
- PA VMT Per Worker; and
- PA VMT Per Service Population
    - Residential VMT, Worker VMT, and Customer VMT

Based on the outputted VMT metrics for the project TAZ, it appears that the project's PA VMT Per Population and PA VMT Per Worker is lower than the jurisdictional average. However, when accounting for the Customer VMT in the PA Per Service Population VMT, the project TAZ's VMT is greater than the jurisdictional average. As a result, *the project is in not within a low VMT generating area*.

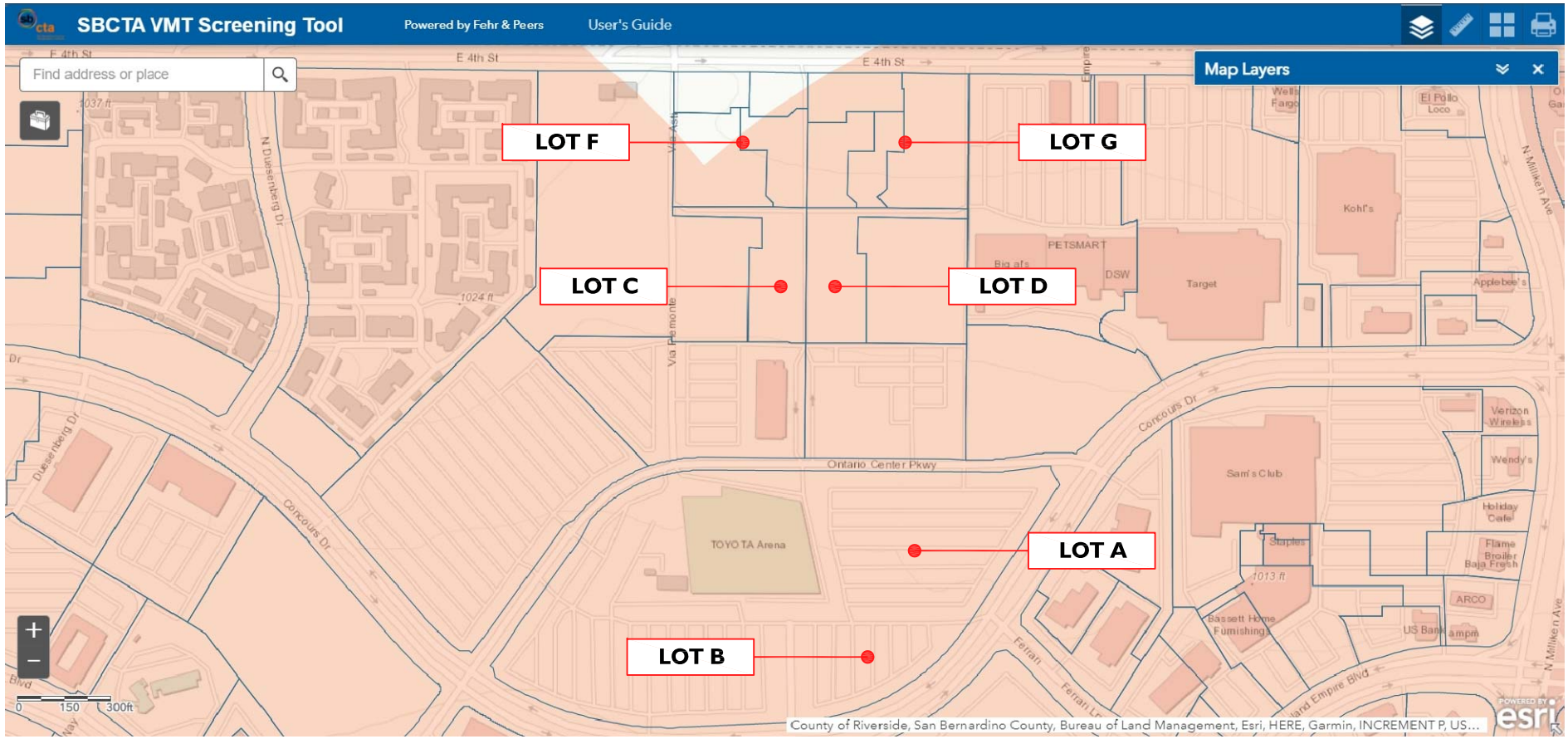
However, it is still noteworthy that the PA VMT Per Population and PA VMT Per Worker is lower than the jurisdiction average VMT.

SBCTA VMT Screening Tool output is shown in Exhibit 6-2.

In summary, the proposed project is found to have a less than significant VMT impact.

Exhibit 6-

Transit Priority Area



Legend:

= Transit Priority Area

N

SBCTA VMT Screening Tool Output

PA VMT Per Population

Output Parcels | Selected Project Area | Low VMT Generating TAZs | San Bernardino Parcels (Zoom in to view) | City Boundaries | San Bernardino County Boundary | Transit Priority Area

Options | Filter by map extent | Zoom to | Clear selection | Refresh

OBJECTID	Assessor Parcel Number (APN)	Traffic Analysis Zone (TAZ)	Community Region	Inside a Transit Priority Area (TPA)	TAZ VMT	Jurisdiction VMT	% Difference	VMT Metric	Threshold	Community Regions have different thresholds (1=Yes, 0=No)	Note	Shape_Length	Shape_Area
1	021020438	53,690,101.00	Ontario	Yes	7.90	14.00	-44.0%	PA VMT Per Population	14.00	0	Screening results are based on location of parcel centroids. If results are desired considering the full parcel, please refer to the associated map layers to visually review parcel and TAZ boundary relationship.	665.02	11,374.10

PA VMT Per Worker

Output Parcels | Selected Project Area | Low VMT Generating TAZs | San Bernardino Parcels (Zoom in to view) | City Boundaries | San Bernardino County Boundary | Transit Priority Area

Options | Filter by map extent | Zoom to | Clear selection | Refresh

OBJECTID	Assessor Parcel Number (APN)	Traffic Analysis Zone (TAZ)	Community Region	Inside a Transit Priority Area (TPA)	TAZ VMT	Jurisdiction VMT	% Difference	VMT Metric	Threshold	Community Regions have different thresholds (1=Yes, 0=No)	Note	Shape_Length	Shape_Area
1	021020438	53,690,101.00	Ontario	Yes	16.50	17.40	-5.28%	PA VMT Per Worker	17.40	0	Screening results are based on location of parcel centroids. If results are desired considering the full parcel, please refer to the associated map layers to visually review parcel and TAZ boundary relationship.	665.02	11,374.10

PA VMT Per Service Population

Output Parcels | Selected Project Area | Low VMT Generating TAZs | TAZ Boundaries (Zoom in to view) | San Bernardino Parcels (Zoom in to view) | City Boundaries | San Bernardino County Boundary | Transit Priority Area

Options | Filter by map extent | Zoom to | Clear selection | Refresh

OBJECTID	Assessor Parcel Number (APN)	Traffic Analysis Zone (TAZ)	Community Region	Inside a Transit Priority Area (TPA)	TAZ VMT	Jurisdiction VMT	% Difference	VMT Metric	Threshold	Community Regions have different thresholds (1=Yes, 0=No)	Note	Shape_Length	Shape_Area
1	021020438	53,690,101.00	Ontario	Yes	36.20	26.10	38.3%	PA VMT Per Service Population	26.10	0	Screening results are based on location of parcel centroids. If results are desired considering the full parcel, please refer to the associated map layers to visually review parcel and TAZ boundary relationship.	665.02	11,374.10

7.0 Findings & Conclusions

7.1 Purpose of Report, Study Objectives & Proposed Project

The purpose of this traffic study is to assess the impacts of the proposed Toyota Arena Mixed-Use Development (hereinafter referred to as project) from a traffic and circulation stand point.

This study has been conducted in accordance with the guidelines detailed in *The Ontario General Plan Update Transportation Technical Report (March 19, 2009)* and recommendations and practices described in the *City of Ontario Planning Commission Resolution No. PC20-021 (May 26, 2020).*

The study has been prepared in accordance with the scope of work discussed and approved by City staff prior to initiating the analysis.

The proposed project is located adjacent to the Toyota Arena, north of Concours Street and south of 4th Street, in the City of Ontario.

The land uses surrounding the site include residential uses to the north, commercial uses to the south and west, and commercial and retail uses to the east at the Ontario Mills Shopping Center. The proposed project consists of the construction and operation of a mixed-use town center development with residential and commercial/retail land uses. The following is a breakdown of the project's development plan:

Proposed Development Plan

Lot	Dwelling Units (DU)	Retail (SF)	Parking Spaces
A	359	25,256	477*
B	98	20,802	130*
C	107	11,047	142*
D	127	14,095	170*
F & G	- -	- -	1,170
Total	**691**	**71,200**	**2,089**

* Parking structure

Main access for the project is planned via the following:

- One (1) signalized intersection at Cleveland Avenue – Via Asti / 4th Street;
- One (1) signalized intersection at Resort Parkway – Via Piemonte / 4th Street;
- One (1) right-in/right-out access driveway along 4th Street; and

The project is planned to open in 2023 and will be evaluated in one single phase.

7.2 Project Trip Generation:

Based on the ITE trip generation rates:

- The proposed project is forecast to generate approximately 6,447 weekday daily trips which include approximately 315 weekday AM peak hour trips, approximately 575 weekday PM peak hour trips.
- The proposed project is forecast to generate approximately 6,677 Saturday daily trips which include approximately 624 Saturday peak hour trips.

After accounting for internal trip capture and applicable ITE pass-by trips rates:

- The proposed project is forecast to generate approximately 5,691 weekday daily trips which include approximately 300 weekday AM peak hour trips, approximately 458 weekday PM peak hour trips.
- The proposed project is forecast to generate approximately 5,813 Saturday daily trips which include approximately 490 Saturday peak hour trips.

7.3.1 Level of Service Analysis Summary – ***Existing Conditions*:**

The study intersections are all currently operating at an acceptable LOS (LOS E or better) during the peak hours for Existing Conditions with exception of the following study intersection:

- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)
    - SAT Peak Hour – LOS F (82.4 secs)

7.3.2 Level of Service Analysis Summary – ***Existing Plus Project Conditions:***

The study intersections are all forecast to continue to operate at an acceptable LOS (LOS E or better) during the peak hours for Existing Plus Project Conditions with exception of the following study intersection:

- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)
    - SAT Peak Hour – LOS F (82.7 secs)

Based on agency-established thresholds, the proposed project is required to contribute to improvements at the following study intersection for Existing Plus Project Conditions:

- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)

After review of the existing roadway conditions at this intersection, no feasible intersection improvements can be identified for this study intersection to achieve acceptable level of service (LOS E or better) for Existing Plus Project Conditions.

7.3.3 Level of Service Analysis Summary – ***Opening Year Without Related Projects Without Project Conditions***:

The study intersections are all forecast to continue to operate at an acceptable LOS (LOS E or better) during the peak hours for Opening Year Without Related Projects Without Project Conditions with exception of the following study intersection:

- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)
    - SAT Peak Hour – LOS F (90.4 secs)

7.3.4 Level of Service Analysis Summary – ***Opening Year Without Related Projects With Project Conditions***:

The study intersections are all forecast to continue to operate at an acceptable LOS (LOS E or better) during the peak hours for Opening Year Without Related Projects With Project Conditions with exception of the following study intersection:

- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)
    - SAT Peak Hour – LOS F (90.8 secs)

Based on agency-established thresholds, the proposed project is required to contribute to improvements at the following study intersection for Opening Year Without Related Projects With Project Conditions:

- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)

After review of the existing roadway conditions at this intersection, no feasible intersection improvements can be identified for this study intersection to achieve acceptable level of service (LOS E or better) for Opening Year Without Related Projects With Project Conditions.

7.3.5 Level of Service Analysis Summary – ***Opening Year With Related Projects Without Project Conditions***:

The study intersections are all forecast to continue to operate at an acceptable LOS (LOS E or better) during the peak hours for Opening Year With Related Projects Without Project Conditions with exception to the following study intersection:

- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)
    - PM Peak Hour – LOS F (94.4 secs)
    - SAT Peak Hour – LOS F (113.9 secs)

7.3.6 Level of Service Analysis Summary – ***Opening Year With Related Projects With Project Conditions***:

The study intersections are all forecast to continue to operate at an acceptable LOS (LOS E or better) during the peak hours for Opening Year With Related Projects With Project Conditions with exception to the following study intersections:

- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)
    - PM Peak Hour – LOS F (97.0 secs)
    - SAT Peak Hour – LOS F (116.1 secs)

Based on agency-established thresholds, the proposed project is required to contribute to improvements at the following study intersection for Opening Year With Related Projects With Project Conditions:

- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)

After review of the existing roadway conditions at this intersection, no feasible intersection improvements can be identified for this study intersection to achieve acceptable level of service (LOS E or better) for Opening Year With Related Projects With Project Conditions.

7.3.7 Level of Service Analysis Summary – ***Horizon Year (2040) Without Project Conditions***:

The study intersections are all forecast to continue to operate at an acceptable LOS (LOS E or better) during the peak hours for Horizon Year (2040) Without Project Conditions with exception to the following study intersection:

- **Int #1:** Haven Avenue (NS) / 4th Street (EW)
    - PM Peak Hour – LOS F (98.0 secs)
- **Int #4:** Project Access 3 (NS) / 4th Street (EW)
    - PM Peak Hour – LOS F (51.9 secs)
- **Int #5:** Milliken Avenue (NS) / 4th Street (EW)
    - PM Peak Hour – LOS F (103.9 secs)
- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)
    - AM Peak Hour LOS – F (118.2 secs)
    - PM Peak Hour – LOS F (149.3 secs)
    - SAT Peak Hour – LOS F (180.2 secs)
- **Int #11:** Haven Avenue (NS) / Inland Empire Boulevard (EW)
    - PM Peak Hour LOS – F (134.7 secs)
- **Int #14:** Milliken Avenue (NS) / Ontario Mills Parkway – I-10 WB Ramps (EW)
    - SAT Peak Hour – LOS F (82.2 secs)

7.3.8 Level of Service Analysis Summary – ***Horizon Year (2040) With Project Conditions***:

The study intersections are all forecast to continue to operate at an acceptable LOS (LOS E or better) during the peak hours for Horizon Year (2040) With Project Conditions with exception to the following study intersections:

- **Int #1:** Haven Avenue (NS) / 4th Street (EW)
    - PM Peak Hour – LOS F (102.3 secs)
- **Int #4** Project Access 3 (NS) / 4th Street (EW)
    - PM Peak Hour – LOS F (73.8 secs)
- **Int #5:** Milliken Avenue (NS) / 4th Street (EW)
    - PM Peak Hour – LOS F (109.7 secs)
- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)
    - AM Peak Hour LOS – F (119.0 secs)
    - PM Peak Hour – LOS F (152.9 secs)
    - SAT Peak Hour – LOS F (184.8 secs)
- **Int #11:** Haven Avenue (NS) / Inland Empire Boulevard (EW)
    - PM Peak Hour LOS – F (136.5 secs)
- **Int #14:** Milliken Avenue (NS) / Ontario Mills Parkway – I-10 WB Ramps (EW)
    - SAT Peak Hour – LOS F (87.3 secs)

Based on agency-established thresholds, the proposed project is required to contribute to improvements at the following study intersection for Horizon Year (2040) With Project Conditions:

- **Int #1:** Haven Avenue (NS) / 4th Street (EW)
- **Int #4:** Project Access 3 (NS) / 4th Street (EW)
- **Int #5:** Milliken Avenue (NS) / 4th Street (EW)
- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)
- **Int #11:** Haven Avenue (NS) / Inland Empire Boulevard (EW)
- **Int #14:** Milliken Avenue (NS) / Ontario Mills Parkway – I-10 WB Ramps (EW)

After review of the existing roadway conditions at these study intersections, no feasible intersection improvements can be identified for the following study intersections to achieve acceptable level of service (LOS E or better) for Horizon Year (2040) With Project Conditions.

- **Int #1:** Haven Avenue (NS) / 4th Street (EW)
- **Int #4:** Project Access 3 (NS) / 4th Street (EW)
- **Int #5:** Milliken Avenue (NS) / 4th Street (EW)
- **Int #6:** I-15 SB Ramps – Ontario Mills Drive (NS) / 4th Street (EW)
- **Int #11:** Haven Avenue (NS) / Inland Empire Boulevard (EW)

The following recommended improvements are identified to restore the intersection of *Milliken Avenue / Ontario Mills Parkway – I-10 WB Ramps* to acceptable conditions (LOS E for Horizon Year (2040) With Project Conditions:

Intersection Improvement #1

Int 14 – Milliken Avenue / Ontario Mills Parkway – I-10 WB Ramps: Make a fair-share contribution to widen the

eastbound off-ramp approach from two left turn lanes, one through lane and one right turn lane to **three** left turn lanes, one through lane, and one right turn lane. Exhibit 7-1 shows the recommended improvement.

Table 7-1 shows the project's fair share traffic contribution to the deficiently-operating study intersections for Opening Year With Related Projects With Project Conditions.

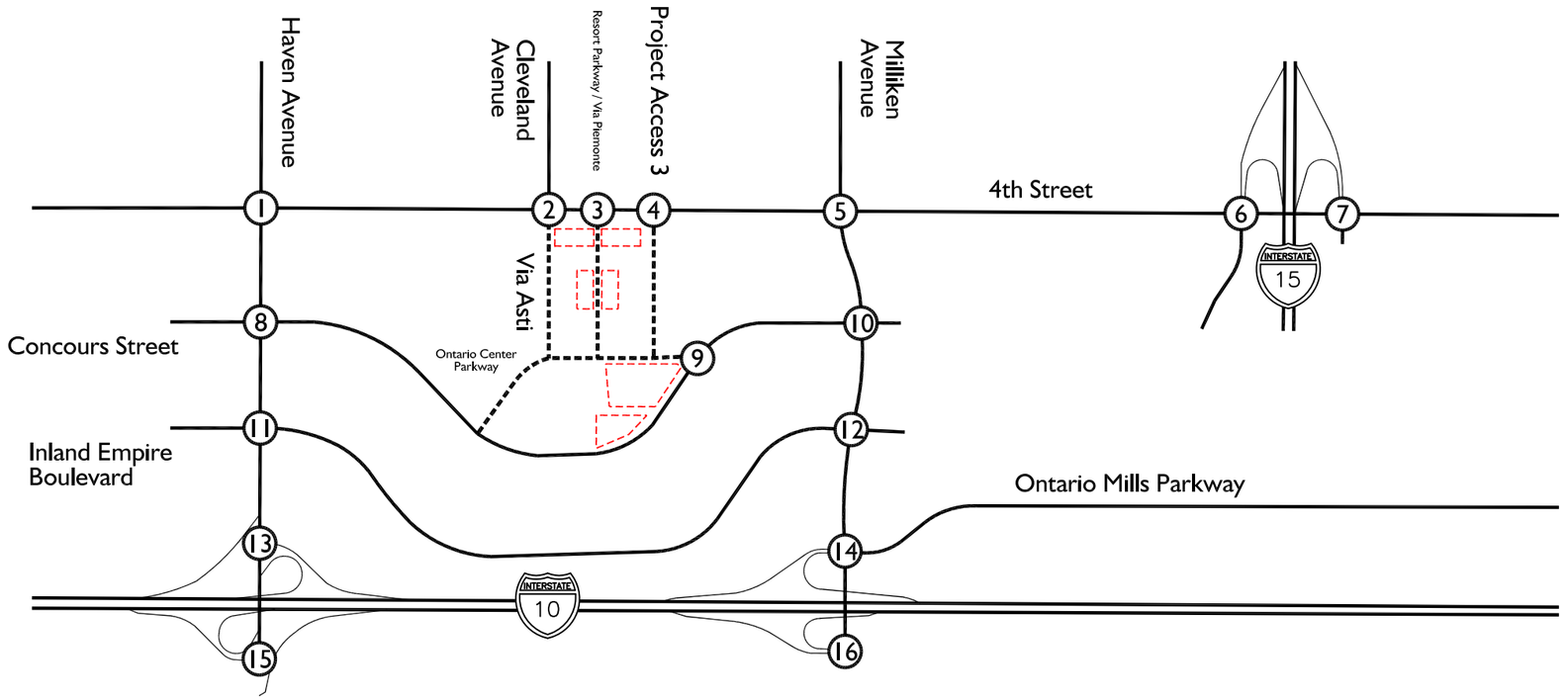
Table 7-2 shows the project's fair share traffic contribution to the deficiently-operating study intersections for Horizon Year (2040) With Project Conditions.

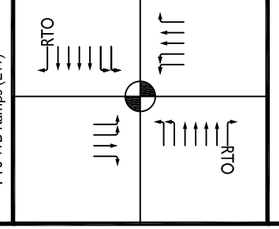
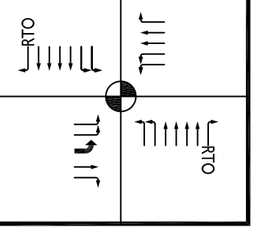
7.4 CEQA VMT Analysis Summary

The proposed project is found to have a less than significant VMT impact.

Exhibit 7-

Recommendations



	Existing Conditions	Existing Plus Project Conditions	Opening Year With Related Projects With Project Conditions	Horizon Year (2040) With Project Condtions
(14) 14. Milliken Avenue (NS) & Ontario Mills Parkway - I-10 WB Ramps (EW)		No Improvements Needed	No Improvements Needed	

Legend:

⬅ = Lane Improvement / Lane Reconfiguration

N

Table 7-1
Project Fair-Share Contribution Summary[1]
Opening Year With Related Projects With Project Conditions Traffic

Intersection	Existing Conditions Traffic			Opening Year With Related Projects With Project Conditions Traffic			Growth in Traffic			Project Traffic			Project Fair-Share		
	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
6. I-15 SB Ramps - Ontario Mills Drive (NS) / 4th Street (EW)	3,526	5,357	5,889	4,177	6,356	7,004	651	999	1,115	75	115	123	11.52%	11.51%	11.03%

[1] Project Fair-Share Contribution represents the project's traffic contribution at each impacted study area intersection as a percentage of the overall growth in traffic for Horizon Year (2040) With Project ConditionsThis table is for informational purposes only and is not tied to any mitigation.

Table 7-2
Project Fair-Share Contribution Summary[1]
Horizon Year (2040) With Project Conditions

Intersection	Existing Conditions Traffic			Horizon Year (2040) With Project Conditions Traffic			Growth in Traffic			Project Traffic			Project Fair-Share		
	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
1. Haven Avenue (NS) / 4th Street (EW)	4,807	5,788	4,513	7,083	8,566	6,723	2,276	2,778	2,210	80	134	148	3.51%	4.82%	6.70%
4. Project Access 3 (NS) / 4th Street (EW)	1,199	2,901	2,094	1,807	4,336	3,169	608	1,435	1,075	60	110	118	9.87%	7.67%	10.98%
5. Milliken Avenue (NS) / 4th Street (EW)	4,850	6,586	5,510	7,170	9,785	8,235	2,320	3,199	2,725	105	191	208	4.53%	5.97%	7.63%
6. I-15 SB Ramps - Ontario Mills Drive (NS) / 4th Street (EW)	3,526	5,357	5,889	5,212	7,919	8,702	1,686	2,562	2,813	75	115	123	4.45%	4.49%	4.37%
11. Haven Avenue (NS) / Inland Empire Boulevard (EW)	5,093	6,430	4,672	7,464	9,436	6,879	2,371	3,006	2,207	45	69	73	1.90%	2.30%	3.31%
14. Milliken Avenue (NS) / Ontario Mills Parkway - I-10 WB Ramps (EW)	3,389	5,211	5,568	5,042	7,751	8,282	1,653	2,540	2,714	105	160	171	6.35%	6.30%	6.30%

[1] Project Fair-Share Contribution represents the project's traffic contribution at each impacted study area intersection as a percentage of the overall growth in traffic for Horizon Year (2040) With Project ConditionsThis table is for informational purposes only and is not tied to any mitigation.

Appendices

Appendix A

Traffic Count Data

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Haven Avenue
E/W: Fourth Street
Weather: Clear

File Name : ONTHA4TAM
Site Code : 04216488
Start Date : 9/13/2016
Page No : 1

Groups Printed- Total Volume

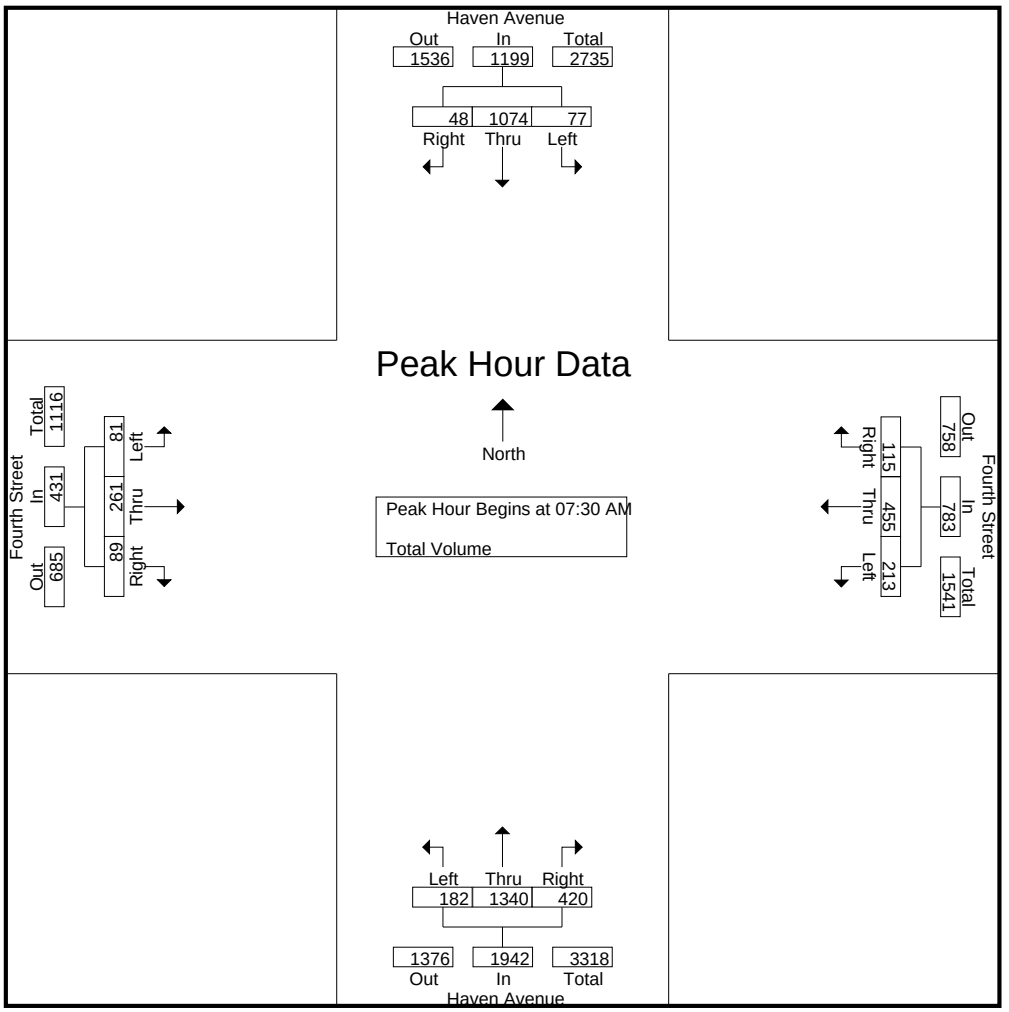
	Haven Avenue Southbound				Fourth Street Westbound				Haven Avenue Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	8	225	9	242	40	88	19	147	32	232	80	344	8	32	35	75	808
07:15 AM	20	237	12	269	45	81	33	159	33	321	84	438	13	36	17	66	932
07:30 AM	19	287	12	318	68	107	40	215	32	298	95	425	14	59	20	93	1051
07:45 AM	23	285	15	323	49	123	25	197	56	361	138	555	19	84	23	126	1201
Total	70	1034	48	1152	202	399	117	718	153	1212	397	1762	54	211	95	360	3992
08:00 AM	21	248	12	281	45	107	30	182	47	365	101	513	24	69	24	117	1093
08:15 AM	14	254	9	277	51	118	20	189	47	316	86	449	24	49	22	95	1010
08:30 AM	20	245	10	275	48	97	22	167	49	315	61	425	11	43	22	76	943
08:45 AM	23	230	13	266	25	74	28	127	41	344	76	461	13	62	26	101	955
Total	78	977	44	1099	169	396	100	665	184	1340	324	1848	72	223	94	389	4001
Grand Total	148	2011	92	2251	371	795	217	1383	337	2552	721	3610	126	434	189	749	7993
Apprch %	6.6	89.3	4.1		26.8	57.5	15.7		9.3	70.7	20		16.8	57.9	25.2		
Total %	1.9	25.2	1.2	28.2	4.6	9.9	2.7	17.3	4.2	31.9	9	45.2	1.6	5.4	2.4	9.4	

	Haven Avenue Southbound				Fourth Street Westbound				Haven Avenue Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	19	**287**	12	318	**68**	107	**40**	**215**	32	298	95	425	14	59	20	93	1051
07:45 AM	**23**	285	**15**	**323**	49	**123**	25	197	**56**	361	**138**	**555**	19	**84**	23	**126**	**1201**
08:00 AM	21	248	12	281	45	107	30	182	47	**365**	101	513	**24**	69	**24**	117	1093
08:15 AM	14	254	9	277	51	118	20	189	47	316	86	449	24	49	22	95	1010
Total Volume	77	1074	48	1199	213	455	115	783	182	1340	420	1942	81	261	89	431	4355
% App. Total	6.4	89.6	4		27.2	58.1	14.7		9.4	69	21.6		18.8	60.6	20.6		
PHF	.837	.936	.800	.928	.783	.925	.719	.910	.813	.918	.761	.875	.844	.777	.927	.855	.907

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Haven Avenue
E/W: Fourth Street
Weather: Clear

File Name : ONTHA4TAM
Site Code : 04216488
Start Date : 9/13/2016
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	19	**287**	12	318	**68**	107	**40**	**215**	32	298	95	425	14	59	20	93
+15 mins.	**23**	285	**15**	**323**	49	**123**	25	197	**56**	361	**138**	**555**	19	**84**	23	**126**
+30 mins.	21	248	12	281	45	107	30	182	47	**365**	101	513	**24**	69	**24**	117
+45 mins.	14	254	9	277	51	118	20	189	47	316	86	449	24	49	22	95
Total Volume	77	1074	48	1199	213	455	115	783	182	1340	420	1942	81	261	89	431
% App. Total	6.4	89.6	4		27.2	58.1	14.7		9.4	69	21.6		18.8	60.6	20.6	
PHF	.837	.936	.800	.928	.783	.925	.719	.910	.813	.918	.761	.875	.844	.777	.927	.855

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City of Ontario
N/S: Haven Avenue
E/W: Fourth Street
Weather: Clear

File Name : ONTHA4TPM
Site Code : 04216488
Start Date : 9/13/2016
Page No : 1

Groups Printed- Total Volume

	Haven Avenue Southbound				Fourth Street Westbound				Haven Avenue Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	32	324	69	425	14	139	28	181	46	338	28	412	83	121	40	244	1262
04:15 PM	32	343	66	441	13	110	21	144	50	302	22	374	83	126	41	250	1209
04:30 PM	32	355	64	451	24	126	19	169	51	300	39	390	65	110	40	215	1225
04:45 PM	23	310	60	393	35	106	26	167	45	318	28	391	80	126	45	251	1202
Total	119	1332	259	1710	86	481	94	661	192	1258	117	1567	311	483	166	960	4898
05:00 PM	39	345	97	481	26	148	23	197	62	341	46	449	73	174	45	292	1419
05:15 PM	35	325	83	443	22	126	19	167	57	342	42	441	77	150	53	280	1331
05:30 PM	30	299	82	411	24	132	21	177	55	329	39	423	87	148	45	280	1291
05:45 PM	28	309	64	401	21	118	9	148	40	313	43	396	65	135	38	238	1183
Total	132	1278	326	1736	93	524	72	689	214	1325	170	1709	302	607	181	1090	5224
Grand Total	251	2610	585	3446	179	1005	166	1350	406	2583	287	3276	613	1090	347	2050	10122
Apprch %	7.3	75.7	17		13.3	74.4	12.3		12.4	78.8	8.8		29.9	53.2	16.9		
Total %	2.5	25.8	5.8	34	1.8	9.9	1.6	13.3	4	25.5	2.8	32.4	6.1	10.8	3.4	20.3	

	Haven Avenue Southbound				Fourth Street Westbound				Haven Avenue Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	23	310	60	393	**35**	106	**26**	167	45	318	28	391	80	126	45	251	1202
05:00 PM	**39**	**345**	**97**	**481**	26	**148**	23	**197**	**62**	341	**46**	**449**	73	**174**	45	**292**	**1419**
05:15 PM	35	325	83	443	22	126	19	167	57	**342**	42	441	77	150	**53**	280	1331
05:30 PM	30	299	82	411	24	132	21	177	55	329	39	423	**87**	148	45	280	1291
Total Volume	127	1279	322	1728	107	512	89	708	219	1330	155	1704	317	598	188	1103	5243
% App. Total	7.3	74	18.6		15.1	72.3	12.6		12.9	78.1	9.1		28.7	54.2	17		
PHF	.814	.927	.830	.898	.764	.865	.856	.898	.883	.972	.842	.949	.911	.859	.887	.944	.924

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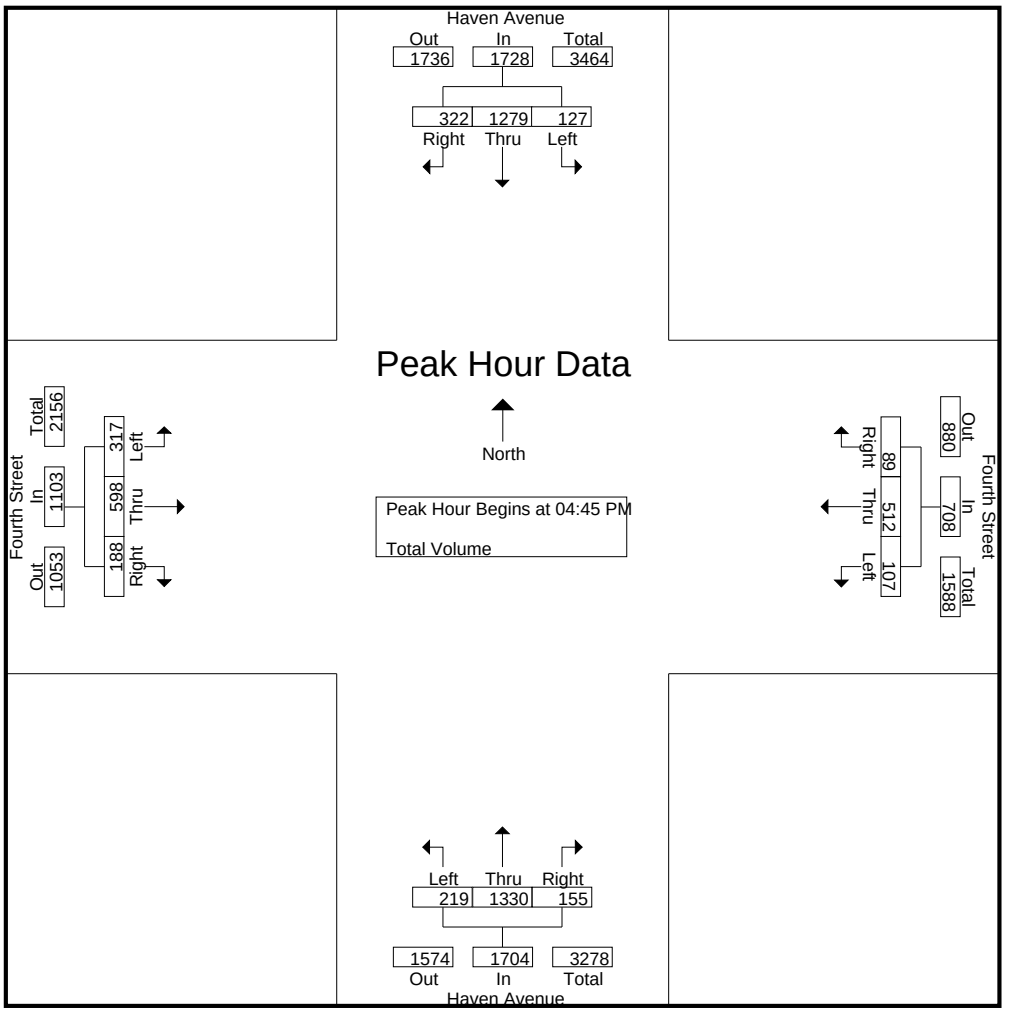
City of Ontario
N/S: Haven Avenue
E/W: Fourth Street
Weather: Clear

File Name : ONTHA4TPM
Site Code : 04216488
Start Date : 9/13/2016
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:45 PM				05:00 PM				04:45 PM			
+0 mins.	32	**355**	64	451	**35**	106	**26**	167	**62**	341	**46**	**449**	80	126	45	251
+15 mins.	23	310	60	393	26	**148**	23	**197**	57	**342**	42	441	73	**174**	45	**292**
+30 mins.	**39**	345	**97**	**481**	22	126	19	167	55	329	39	423	77	150	**53**	280
+45 mins.	35	325	83	443	24	132	21	177	40	313	43	396	**87**	148	45	280
Total Volume	129	1335	304	1768	107	512	89	708	214	1325	170	1709	317	598	188	1103
% App. Total	7.3	75.5	17.2		15.1	72.3	12.6		12.5	77.5	9.9		28.7	54.2	17	
PHF	.827	.940	.784	.919	.764	.865	.856	.898	.863	.969	.924	.952	.911	.859	.887	.944

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City of Ontario
N/S: Cleveland Avenue / Via Asti
E/W: 4th Street
Weather: Clear

File Name : 02_ONT_Cleveland_4th_AM
Site Code : 10521235
Start Date : 5/27/2021
Page No : 1

Groups Printed- Total Volume

	Cleveland Avenue Southbound				4th Street Westbound				Via Asti Northbound				4th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	1	0	2	3	0	98	8	106	0	0	0	0	5	66	2	73	182
07:15 AM	1	0	0	1	0	108	8	116	0	0	0	0	4	67	2	73	190
07:30 AM	0	0	0	0	1	122	9	132	2	1	0	3	11	78	5	94	229
07:45 AM	0	0	0	0	0	136	11	147	0	0	0	0	8	100	3	111	258
Total	2	0	2	4	1	464	36	501	2	1	0	3	28	311	12	351	859
08:00 AM	0	0	2	2	0	110	8	118	0	0	0	0	3	74	3	80	200
08:15 AM	0	0	0	0	0	116	12	128	0	0	1	1	5	99	4	108	237
08:30 AM	2	0	2	4	0	106	5	111	2	0	1	3	2	96	2	100	218
08:45 AM	4	0	0	4	0	114	4	118	1	0	1	2	7	97	3	107	231
Total	6	0	4	10	0	446	29	475	3	0	3	6	17	366	12	395	886
Grand Total	8	0	6	14	1	910	65	976	5	1	3	9	45	677	24	746	1745
Apprch %	57.1	0	42.9		0.1	93.2	6.7		55.6	11.1	33.3		6	90.8	3.2		
Total %	0.5	0	0.3	0.8	0.1	52.1	3.7	55.9	0.3	0.1	0.2	0.5	2.6	38.8	1.4	42.8	

	Cleveland Avenue Southbound				4th Street Westbound				Via Asti Northbound				4th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	**1**	122	9	132	**2**	**1**	0	**3**	**11**	78	**5**	94	229
07:45 AM	0	0	0	0	0	**136**	11	**147**	0	0	0	0	8	**100**	3	**111**	**258**
08:00 AM	0	0	**2**	**2**	0	110	8	118	0	0	0	0	3	74	3	80	200
08:15 AM	0	0	0	0	0	116	**12**	128	0	0	**1**	1	5	99	4	108	237
Total Volume	0	0	2	2	1	484	40	525	2	1	1	4	27	351	15	393	924
% App. Total	0	0	100		0.2	92.2	7.6		50	25	25		6.9	89.3	3.8		
PHF	.000	.000	.250	.250	.250	.890	.833	.893	.250	.250	.250	.333	.614	.878	.750	.885	.895

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City of Ontario
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Weather: Clear

File Name : 02_ONT_Cleveland_4th_AM
Site Code : 10521235
Start Date : 5/27/2021
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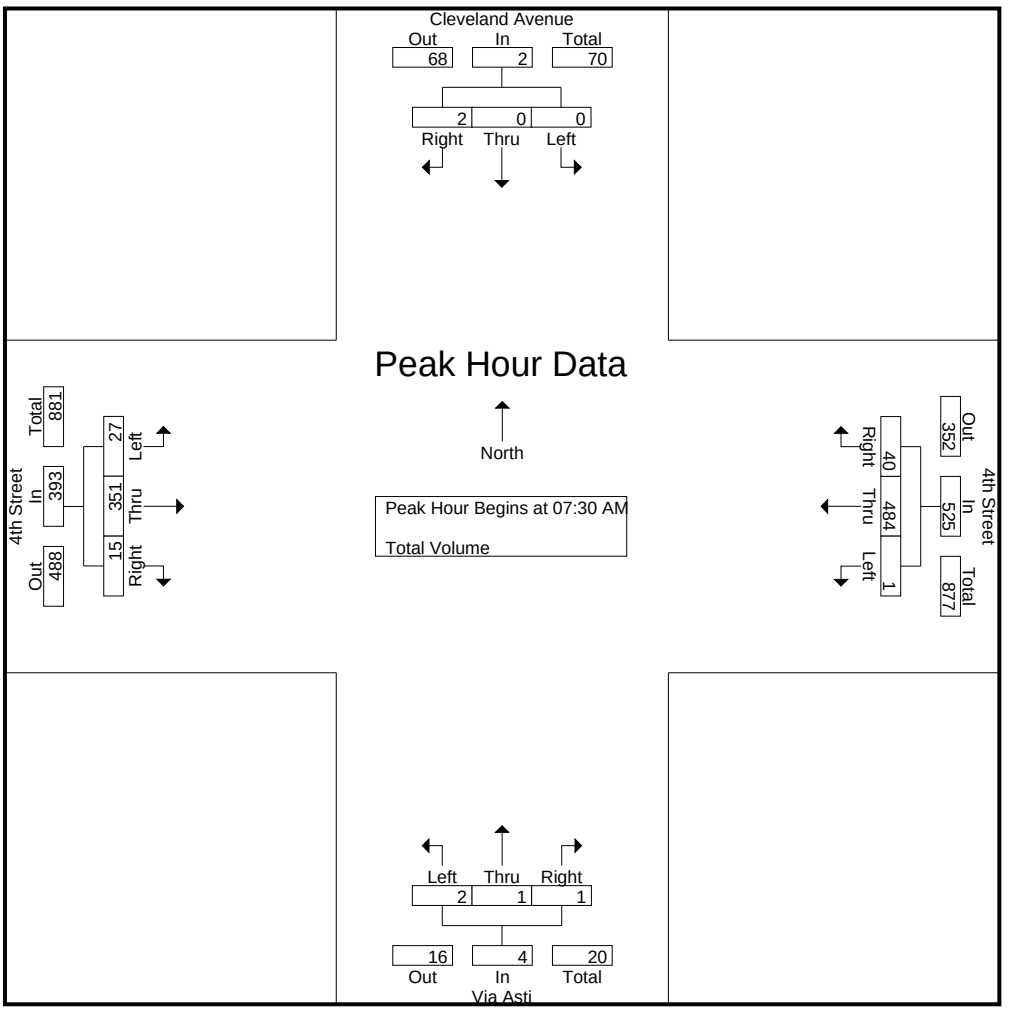

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM				07:30 AM				08:00 AM				07:45 AM			
+0 mins.	0	0	**2**	2	**1**	122	9	132	0	0	0	0	**8**	**100**	3	**111**
+15 mins.	0	0	0	0	0	**136**	11	**147**	0	0	**1**	1	3	74	3	80
+30 mins.	2	0	2	**4**	0	110	8	118	**2**	0	1	**3**	5	99	**4**	108
+45 mins.	**4**	0	0	4	0	116	**12**	128	1	0	1	2	2	96	2	100
Total Volume	6	0	4	10	1	484	40	525	3	0	3	6	18	369	12	399
% App. Total	60	0	40		0.2	92.2	7.6		50	0	50		4.5	92.5	3	
PHF	.375	.000	.500	.625	.250	.890	.833	.893	.375	.000	.750	.500	.563	.923	.750	.899

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City of Ontario
N/S: Cleveland Avenue / Via Asti
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Weather: Clear

File Name : 02_ONT_Cleveland_4th_PM
Site Code : 10521235
Start Date : 5/27/2021

Groups Printed- Total Volume

	Cleveland Avenue Southbound				4th Street Westbound				Via Asti Northbound				4th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	6	1	3	10	0	199	0	199	1	0	0	1	1	276	1	278	488
04:15 PM	6	0	1	7	0	190	1	191	1	0	0	1	3	290	3	296	495
04:30 PM	10	0	2	12	1	190	1	192	2	0	3	5	1	330	1	332	541
04:45 PM	5	0	1	6	0	206	2	208	1	0	3	4	0	286	0	286	504
Total	27	1	7	35	1	785	4	790	5	0	6	11	5	1182	5	1192	2028
05:00 PM	22	0	3	25	0	192	2	194	2	0	2	4	2	326	1	329	552
05:15 PM	5	0	2	7	0	189	1	190	3	0	0	3	0	292	1	293	493
05:30 PM	1	0	1	2	0	181	2	183	2	0	2	4	0	333	0	333	522
05:45 PM	5	0	3	8	1	208	5	214	3	0	3	6	1	326	2	329	557
Total	33	0	9	42	1	770	10	781	10	0	7	17	3	1277	4	1284	2124
Grand Total	60	1	16	77	2	1555	14	1571	15	0	13	28	8	2459	9	2476	4152
Apprch %	77.9	1.3	20.8		0.1	99	0.9		53.6	0	46.4		0.3	99.3	0.4		
Total %	1.4	0	0.4	1.9	0	37.5	0.3	37.8	0.4	0	0.3	0.7	0.2	59.2	0.2	59.6	

	Cleveland Avenue Southbound				4th Street Westbound				Via Asti Northbound				4th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**22**	0	**3**	**25**	0	192	2	194	2	0	2	4	**2**	326	1	329	552
05:15 PM	5	0	2	7	0	189	1	190	**3**	0	0	3	0	292	1	293	493
05:30 PM	1	0	1	2	0	181	2	183	2	0	2	4	0	**333**	0	**333**	522
05:45 PM	5	0	3	8	**1**	**208**	**5**	**214**	3	0	**3**	**6**	1	326	**2**	329	**557**
Total Volume	33	0	9	42	1	770	10	781	10	0	7	17	3	1277	4	1284	2124
% App. Total	78.6	0	21.4		0.1	98.6	1.3		58.8	0	41.2		0.2	99.5	0.3		
PHF	.375	.000	.750	.420	.250	.925	.500	.912	.833	.000	.583	.708	.375	.959	.500	.964	.953

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City of Ontario
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File Name : 02_ONT_Cleveland_4th_PM
Site Code : 10521235
Start Date : 5/27/2021
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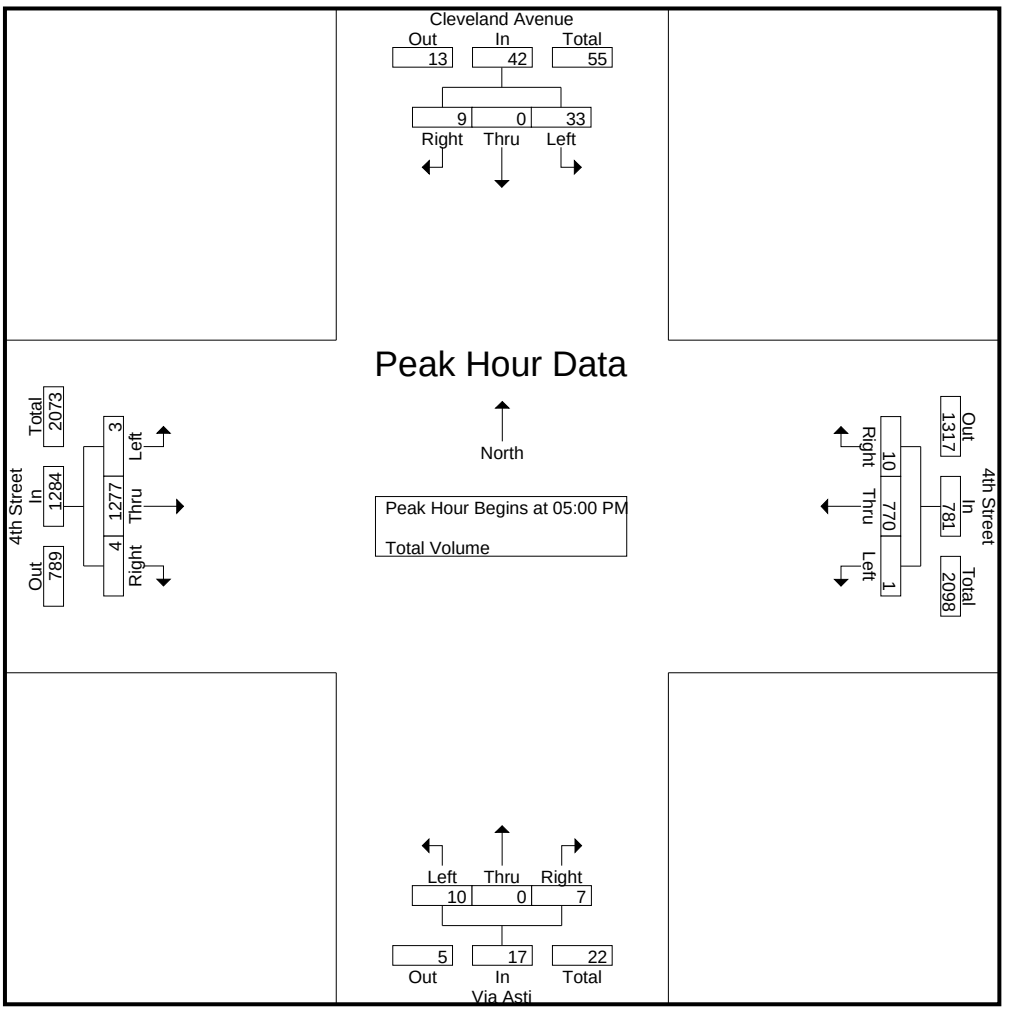

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:00 PM				05:00 PM				05:00 PM			
+0 mins.	6	0	1	7	0	199	0	199	2	0	2	4	**2**	326	1	329
+15 mins.	10	0	2	12	0	190	1	191	**3**	0	0	3	0	292	1	293
+30 mins.	5	0	1	6	**1**	190	1	192	2	0	2	4	0	**333**	0	**333**
+45 mins.	**22**	0	**3**	**25**	0	**206**	**2**	**208**	3	0	**3**	**6**	1	326	**2**	329
Total Volume	43	0	7	50	1	785	4	790	10	0	7	17	3	1277	4	1284
% App. Total	86	0	14		0.1	99.4	0.5		58.8	0	41.2		0.2	99.5	0.3	
PHF	.489	.000	.583	.500	.250	.953	.500	.950	.833	.000	.583	.708	.375	.959	.500	.964

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City of Ontario
N/S: Resort Pkwy / Via Piemonte
E/W: 4th Street
Weather: Clear

File Name : 03_ONT_Resort_4th_AM
Site Code : 10521235
Start Date : 5/27/2021
Page No : 1

Groups Printed- Total Volume

	Resort Parkway Southbound				4th Street Westbound				Via Piemonte Northbound				4th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	4	1	5	10	1	104	10	115	0	0	2	2	5	59	3	67	194
07:15 AM	7	1	3	11	2	105	13	120	6	1	3	10	7	52	0	59	200
07:30 AM	7	0	2	9	3	133	6	142	0	0	1	1	1	81	0	82	234
07:45 AM	6	0	3	9	4	130	2	136	4	1	0	5	3	99	1	103	253
Total	24	2	13	39	10	472	31	513	10	2	6	18	16	291	4	311	881
08:00 AM	4	1	4	9	1	107	3	111	2	0	6	8	3	72	1	76	204
08:15 AM	7	1	3	11	3	128	3	134	0	1	1	2	3	96	1	100	247
08:30 AM	3	0	1	4	5	112	7	124	0	0	0	0	2	96	0	98	226
08:45 AM	7	0	1	8	5	121	5	131	0	0	0	0	1	100	3	104	243
Total	21	2	9	32	14	468	18	500	2	1	7	10	9	364	5	378	920
Grand Total	45	4	22	71	24	940	49	1013	12	3	13	28	25	655	9	689	1801
Apprch %	63.4	5.6	31		2.4	92.8	4.8		42.9	10.7	46.4		3.6	95.1	1.3		
Total %	2.5	0.2	1.2	3.9	1.3	52.2	2.7	56.2	0.7	0.2	0.7	1.6	1.4	36.4	0.5	38.3	

	Resort Parkway Southbound				4th Street Westbound				Via Piemonte Northbound				4th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**7**	0	2	9	3	**133**	**6**	**142**	0	0	1	1	1	81	0	82	234
07:45 AM	6	0	3	9	**4**	130	2	136	**4**	**1**	0	5	**3**	**99**	**1**	**103**	**253**
08:00 AM	4	**1**	**4**	9	1	107	3	111	2	0	**6**	**8**	3	72	1	76	204
08:15 AM	7	1	3	**11**	3	128	3	134	0	1	1	2	3	96	1	100	247
Total Volume	24	2	12	38	11	498	14	523	6	2	8	16	10	348	3	361	938
% App. Total	63.2	5.3	31.6		2.1	95.2	2.7		37.5	12.5	50		2.8	96.4	0.8		
PHF	.857	.500	.750	.864	.688	.936	.583	.921	.375	.500	.333	.500	.833	.879	.750	.876	.927

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City of Ontario
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File Name : 03_ONT_Resort_4th_AM
Site Code : 10521235
Start Date : 5/27/2021
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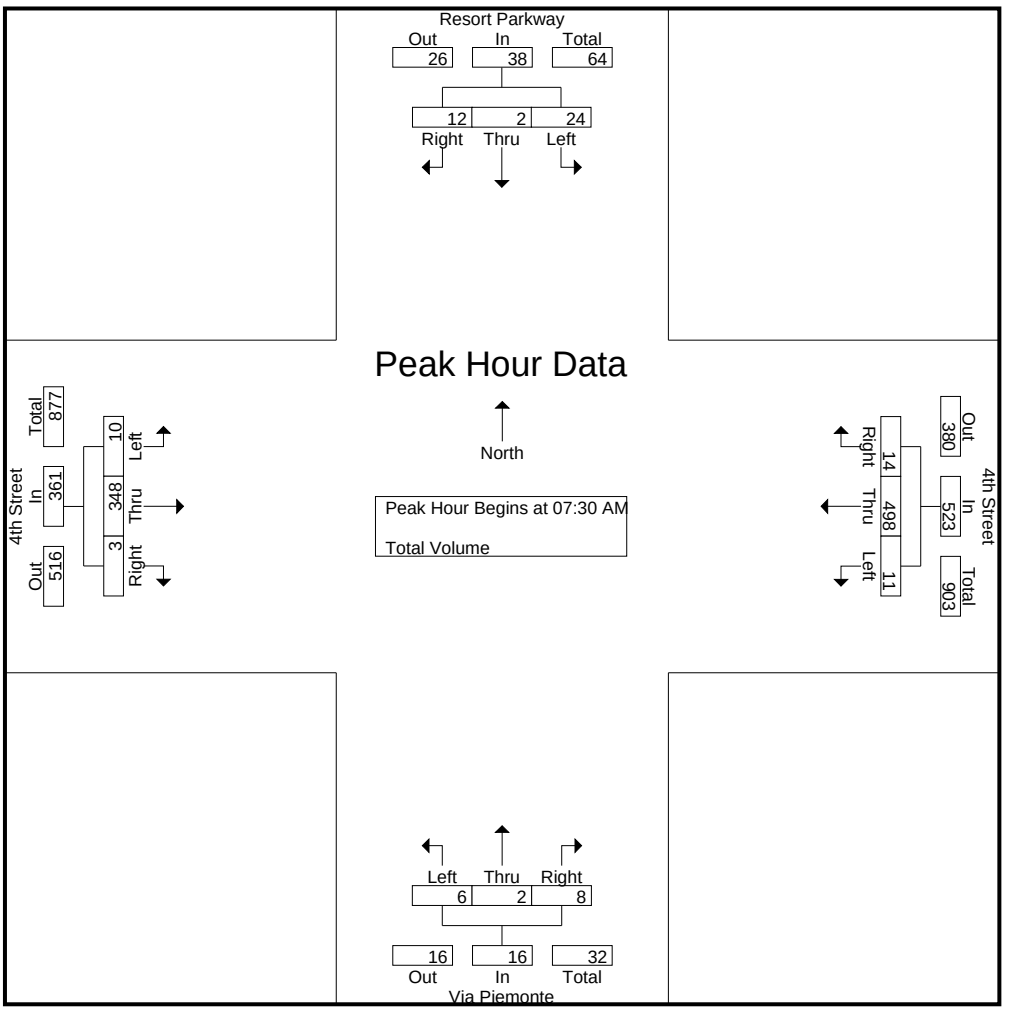

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:30 AM				07:15 AM				08:00 AM			
+0 mins.	4	**1**	**5**	10	3	**133**	**6**	**142**	**6**	**1**	3	**10**	**3**	72	1	76
+15 mins.	**7**	1	3	**11**	**4**	130	2	136	0	0	1	1	3	96	1	100
+30 mins.	7	0	2	9	1	107	3	111	4	1	0	5	2	96	0	98
+45 mins.	6	0	3	9	3	128	3	134	2	0	**6**	8	1	**100**	**3**	**104**
Total Volume	24	2	13	39	11	498	14	523	12	2	10	24	9	364	5	378
% App. Total	61.5	5.1	33.3		2.1	95.2	2.7		50	8.3	41.7		2.4	96.3	1.3	
PHF	.857	.500	.650	.886	.688	.936	.583	.921	.500	.500	.417	.600	.750	.910	.417	.909

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City of Ontario
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File Name : 03_ONT_Resort_4th_PM
Site Code : 10521235
Start Date : 5/27/2021
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Groups Printed- Total Volume

	Resort Parkway Southbound				4th Street Westbound				Via Piemonte Northbound				4th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	9	0	6	15	0	184	5	189	5	0	6	11	1	271	1	273	488
04:15 PM	5	0	0	5	1	199	8	208	0	0	3	3	4	289	1	294	510
04:30 PM	12	1	5	18	2	190	6	198	1	0	1	2	5	352	0	357	575
04:45 PM	6	0	6	12	0	203	7	210	4	0	8	12	10	287	3	300	534
Total	32	1	17	50	3	776	26	805	10	0	18	28	20	1199	5	1224	2107
05:00 PM	7	0	3	10	1	178	6	185	3	0	2	5	2	361	2	365	565
05:15 PM	8	0	4	12	1	184	9	194	1	1	1	3	2	289	0	291	500
05:30 PM	5	0	2	7	2	174	8	184	3	0	2	5	7	324	1	332	528
05:45 PM	12	0	4	16	1	204	9	214	2	0	3	5	3	335	4	342	577
Total	32	0	13	45	5	740	32	777	9	1	8	18	14	1309	7	1330	2170
Grand Total	64	1	30	95	8	1516	58	1582	19	1	26	46	34	2508	12	2554	4277
Apprch %	67.4	1.1	31.6		0.5	95.8	3.7		41.3	2.2	56.5		1.3	98.2	0.5		
Total %	1.5	0	0.7	2.2	0.2	35.4	1.4	37	0.4	0	0.6	1.1	0.8	58.6	0.3	59.7	

	Resort Parkway Southbound				4th Street Westbound				Via Piemonte Northbound				4th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	5	0	0	5	1	199	**8**	208	0	0	3	3	4	289	1	294	510
04:30 PM	**12**	**1**	5	**18**	**2**	190	6	198	1	0	1	2	5	352	0	357	**575**
04:45 PM	6	0	**6**	12	0	**203**	7	**210**	**4**	0	**8**	**12**	**10**	287	**3**	300	534
05:00 PM	7	0	3	10	1	178	6	185	3	0	2	5	2	**361**	2	**365**	565
Total Volume	30	1	14	45	4	770	27	801	8	0	14	22	21	1289	6	1316	2184
% App. Total	66.7	2.2	31.1		0.5	96.1	3.4		36.4	0	63.6		1.6	97.9	0.5		
PHF	.625	.250	.583	.625	.500	.948	.844	.954	.500	.000	.438	.458	.525	.893	.500	.901	.950

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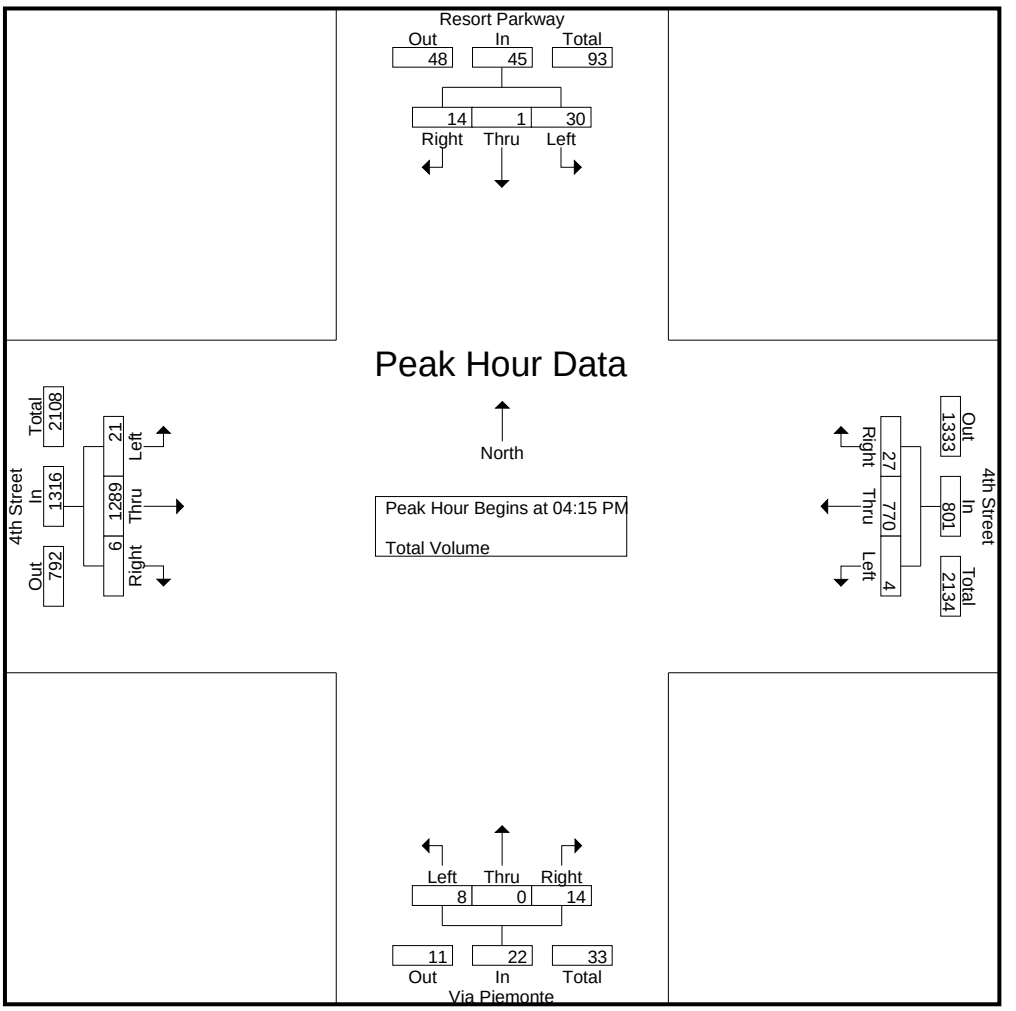
City of Ontario
N/S: Resort Pkwy / Via Piemonte
E/W: 4th Street
Weather: Clear

File Name : 03_ONT_Resort_4th_PM
Site Code : 10521235
Start Date : 5/27/2021
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:00 PM				04:00 PM				05:00 PM			
+0 mins.	**12**	**1**	5	**18**	0	184	5	189	**5**	0	6	11	2	**361**	2	**365**
+15 mins.	6	0	**6**	12	1	199	**8**	208	0	0	3	3	2	289	0	291
+30 mins.	7	0	3	10	**2**	190	6	198	1	0	1	2	**7**	324	1	332
+45 mins.	8	0	4	12	0	**203**	7	**210**	4	0	**8**	**12**	3	335	**4**	342
Total Volume	33	1	18	52	3	776	26	805	10	0	18	28	14	1309	7	1330
% App. Total	63.5	1.9	34.6		0.4	96.4	3.2		35.7	0	64.3		1.1	98.4	0.5	
PHF	.688	.250	.750	.722	.375	.956	.813	.958	.500	.000	.563	.583	.500	.907	.438	.911

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City of Ontario
N/S: Project Access 3
E/W: 4th Street
Weather: Clear

File Name : 04_ONT_Project Access_4th_AM
Site Code : 10521235
Start Date : 5/27/2021
Page No : 1

Groups Printed- Total Volume

	4th Street Westbound			Via Piemonte Northbound			4th Street Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	0	108	108	0	0	0	63	0	63	171
07:15 AM	0	115	115	0	0	0	65	0	65	180
07:30 AM	0	131	131	0	0	0	88	0	88	219
07:45 AM	0	135	135	0	0	0	101	5	106	241
Total	0	489	489	0	0	0	317	5	322	811
08:00 AM	0	109	109	0	0	0	83	2	85	194
08:15 AM	0	128	128	0	0	0	94	4	98	226
08:30 AM	0	121	121	0	2	2	97	4	101	224
08:45 AM	0	128	128	0	0	0	98	7	105	233
Total	0	486	486	0	2	2	372	17	389	877
Grand Total	0	975	975	0	2	2	689	22	711	1688
Apprch %	0	100		0	100		96.9	3.1		
Total %	0	57.8	57.8	0	0.1	0.1	40.8	1.3	42.1	

	4th Street Westbound			Via Piemonte Northbound			4th Street Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	0	**135**	**135**	0	0	0	**101**	**5**	**106**	**241**
08:00 AM	0	109	109	0	0	0	83	2	85	194
08:15 AM	0	128	128	0	0	0	94	4	98	226
08:30 AM	0	121	121	0	**2**	**2**	97	4	101	224
Total Volume	0	493	493	0	2	2	375	15	390	885
% App. Total	0	100		0	100		96.2	3.8		
PHF	.000	.913	.913	.000	.250	.250	.928	.750	.920	.918

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City of Ontario
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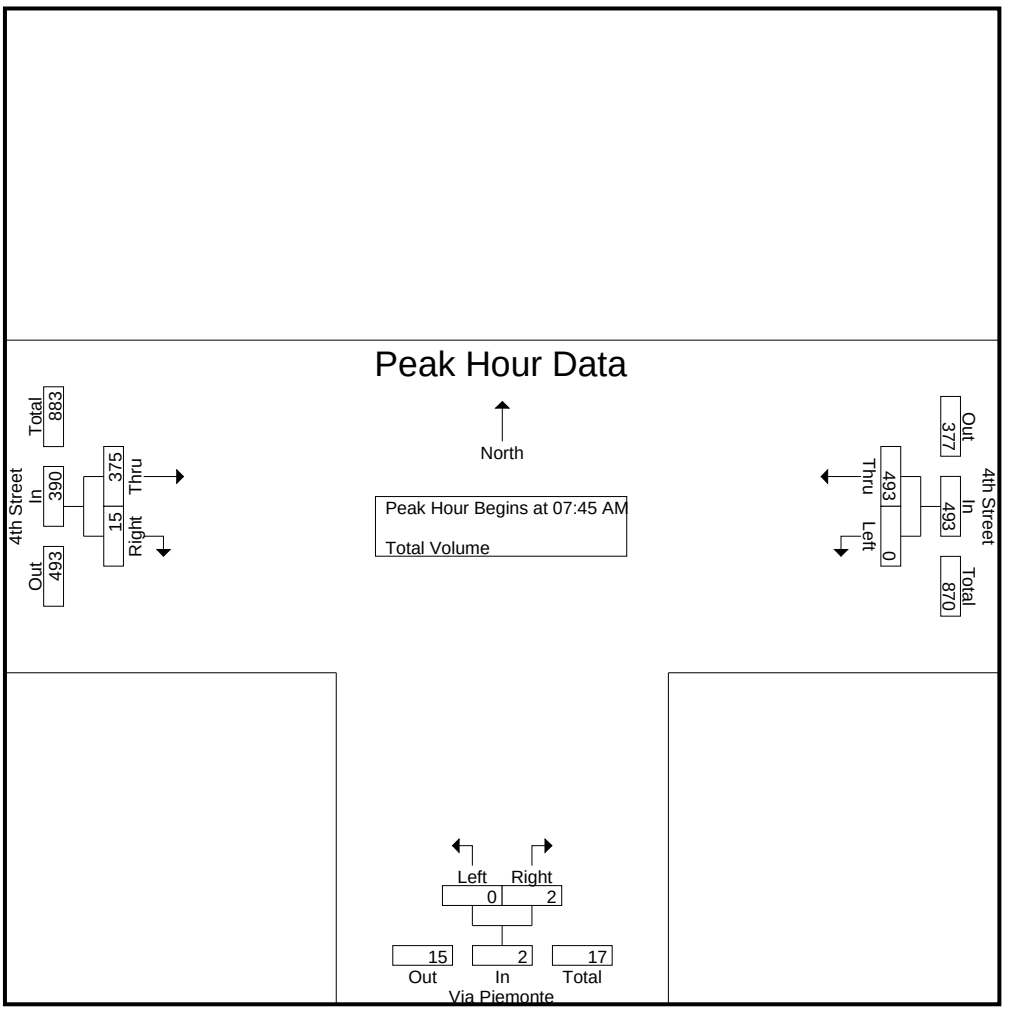
Weather: Clear

File Name : 04_ONT_Project Access_4th_AM
Site Code : 10521235
Start Date : 5/27/2021
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM			07:45 AM			07:45 AM		
+0 mins.	0	131	131	0	0	0	**101**	**5**	**106**
+15 mins.	0	**135**	**135**	0	0	0	83	2	85
+30 mins.	0	109	109	0	0	0	94	4	98
+45 mins.	0	128	128	0	**2**	**2**	97	4	101
Total Volume	0	503	503	0	2	2	375	15	390
% App. Total	0	100		0	100		96.2	3.8	
PHF	.000	.931	.931	.000	.250	.250	.928	.750	.920

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City of Ontario
N/S: Project Access 3
E/W: 4th Street
Weather: Clear

File Name : 04_ONT_Project Access_4th_PM
Site Code : 10521235
Start Date : 5/27/2021
Page No : 1

Groups Printed- Total Volume

	4th Street Westbound			Via Piemonte Northbound			4th Street Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
04:00 PM	0	185	185	0	1	1	271	6	277	463
04:15 PM	0	201	201	0	7	7	283	19	302	510
04:30 PM	0	197	197	0	7	7	347	6	353	557
04:45 PM	0	203	203	0	3	3	303	8	311	517
Total	0	786	786	0	18	18	1204	39	1243	2047
05:00 PM	0	181	181	0	2	2	361	12	373	556
05:15 PM	0	190	190	0	9	9	294	16	310	509
05:30 PM	0	179	179	0	3	3	293	19	312	494
05:45 PM	0	207	207	0	3	3	331	9	340	550
Total	0	757	757	0	17	17	1279	56	1335	2109
Grand Total	0	1543	1543	0	35	35	2483	95	2578	4156
Apprch %	0	100		0	100		96.3	3.7		
Total %	0	37.1	37.1	0	0.8	0.8	59.7	2.3	62	

	4th Street Westbound			Via Piemonte Northbound			4th Street Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	201	201	0	**7**	**7**	283	**19**	302	510
04:30 PM	0	197	197	0	7	7	347	6	353	**557**
04:45 PM	0	**203**	**203**	0	3	3	303	8	311	517
05:00 PM	0	181	181	0	2	2	**361**	12	**373**	556
Total Volume	0	782	782	0	19	19	1294	45	1339	2140
% App. Total	0	100		0	100		96.6	3.4		
PHF	.000	.963	.963	.000	.679	.679	.896	.592	.897	.961

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City of Ontario
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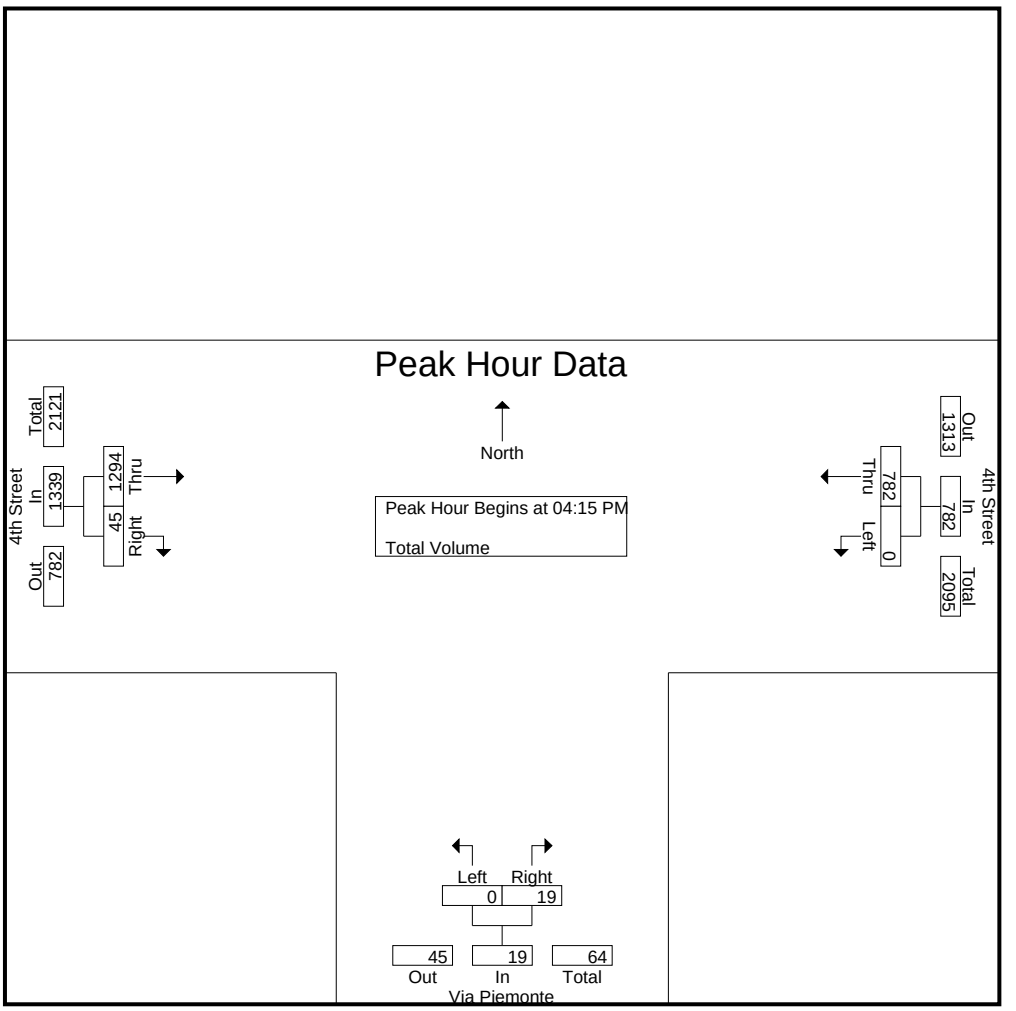
E/W: 4th Street
Weather: Clear

File Name : 04_ONT_Project Access_4th_PM
Site Code : 10521235
Start Date : 5/27/2021
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM			04:30 PM			04:30 PM		
+0 mins.	0	185	185	0	7	7	347	6	353
+15 mins.	0	201	201	0	3	3	303	8	311
+30 mins.	0	197	197	0	2	2	**361**	12	**373**
+45 mins.	0	**203**	**203**	0	**9**	**9**	294	**16**	310
Total Volume	0	786	786	0	21	21	1305	42	1347
% App. Total	0	100		0	100		96.9	3.1	
PHF	.000	.968	.968	.000	.583	.583	.904	.656	.903

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City of Rancho Cucamonga
N/S: Milliken Avenue
E/W: Fourth Street
Weather: Clear

File Name : RNCMI4TAM
Site Code : 04216253
Start Date : 7/6/2016
Page No : 1

Groups Printed- Total Volume

	Milliken Avenue Southbound				Fourth Street Westbound				Milliken Avenue Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	36	120	16	172	62	125	57	244	33	93	20	146	17	40	13	70	632
07:15 AM	36	128	15	179	76	152	71	299	28	103	12	143	20	40	19	79	700
07:30 AM	35	170	9	214	90	238	73	401	56	143	16	215	22	46	25	93	923
07:45 AM	57	179	14	250	84	278	87	449	53	197	31	281	27	65	25	117	1097
Total	164	597	54	815	312	793	288	1393	170	536	79	785	86	191	82	359	3352
08:00 AM	29	131	9	169	77	176	77	330	31	149	30	210	22	41	19	82	791
08:15 AM	32	131	17	180	88	207	66	361	39	122	25	186	29	49	26	104	831
08:30 AM	37	126	11	174	103	231	61	395	35	110	35	180	30	45	24	99	848
08:45 AM	47	123	22	192	77	226	82	385	45	128	30	203	28	50	24	102	882
Total	145	511	59	715	345	840	286	1471	150	509	120	779	109	185	93	387	3352
Grand Total	309	1108	113	1530	657	1633	574	2864	320	1045	199	1564	195	376	175	746	6704
Apprch %	20.2	72.4	7.4		22.9	57	20		20.5	66.8	12.7		26.1	50.4	23.5		
Total %	4.6	16.5	1.7	22.8	9.8	24.4	8.6	42.7	4.8	15.6	3	23.3	2.9	5.6	2.6	11.1	

	Milliken Avenue Southbound				Fourth Street Westbound				Milliken Avenue Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	35	170	9	214	**90**	238	73	401	**56**	143	16	215	22	46	25	93	923
07:45 AM	**57**	**179**	14	**250**	84	**278**	**87**	**449**	53	**197**	**31**	**281**	27	**65**	25	**117**	**1097**
08:00 AM	29	131	9	169	77	176	77	330	31	149	30	210	22	41	19	82	791
08:15 AM	32	131	**17**	180	88	207	66	361	39	122	25	186	**29**	49	**26**	104	831
Total Volume	153	611	49	813	339	899	303	1541	179	611	102	892	100	201	95	396	3642
% App. Total	18.8	75.2	6		22	58.3	19.7		20.1	68.5	11.4		25.3	50.8	24		
PHF	.671	.853	.721	.813	.942	.808	.871	.858	.799	.775	.823	.794	.862	.773	.913	.846	.830

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City of Rancho Cucamonga
N/S: Milliken Avenue
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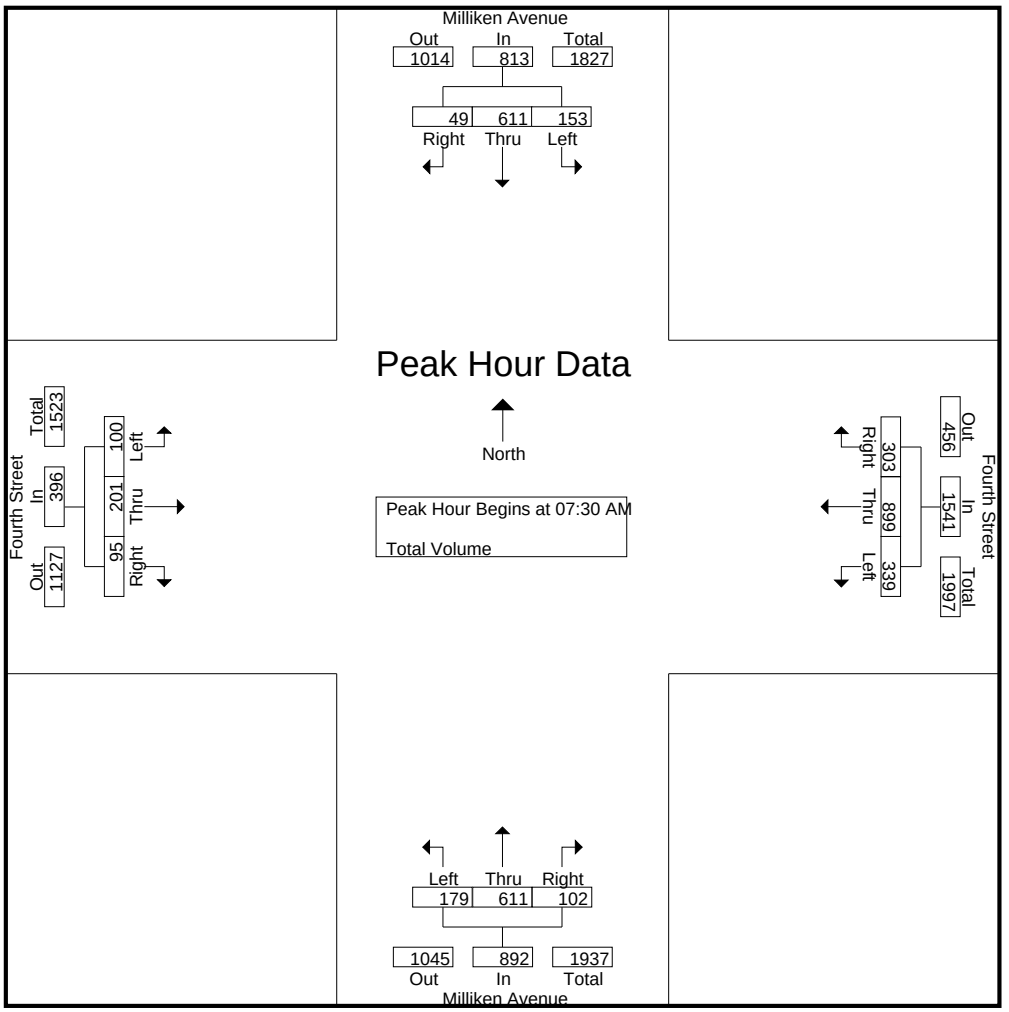
Weather: Clear

File Name : RNCMI4TAM
Site Code : 04216253
Start Date : 7/6/2016
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:30 AM				07:30 AM				07:45 AM			
+0 mins.	36	120	**16**	172	**90**	238	73	401	**56**	143	16	215	27	**65**	25	**117**
+15 mins.	36	128	15	179	84	**278**	**87**	**449**	53	**197**	**31**	**281**	22	41	19	82
+30 mins.	35	170	9	214	77	176	77	330	31	149	30	210	29	49	**26**	104
+45 mins.	**57**	**179**	14	**250**	88	207	66	361	39	122	25	186	**30**	45	24	99
Total Volume	164	597	54	815	339	899	303	1541	179	611	102	892	108	200	94	402
% App. Total	20.1	73.3	6.6		22	58.3	19.7		20.1	68.5	11.4		26.9	49.8	23.4	
PHF	.719	.834	.844	.815	.942	.808	.871	.858	.799	.775	.823	.794	.900	.769	.904	.859

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City of Rancho Cucamonga
N/S: Milliken Avenue
E/W: Fourth Street
Weather: Clear

File Name : RNCMI4TPM
Site Code : 04216253
Start Date : 7/6/2016
Page No : 1

Groups Printed- Total Volume

	Milliken Avenue Southbound				Fourth Street Westbound				Milliken Avenue Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	87	176	18	281	82	127	64	273	58	238	77	373	89	150	95	334	1261
04:15 PM	95	140	23	258	75	124	80	279	68	229	76	373	120	250	72	442	1352
04:30 PM	103	202	42	347	83	114	61	258	45	263	77	385	77	194	58	329	1319
04:45 PM	108	202	28	338	71	134	69	274	52	279	78	409	75	215	48	338	1359
Total	393	720	111	1224	311	499	274	1084	223	1009	308	1540	361	809	273	1443	5291
05:00 PM	133	197	38	368	93	110	58	261	80	309	82	471	83	271	64	418	1518
05:15 PM	120	176	27	323	81	129	69	279	75	374	93	542	102	295	86	483	1627
05:30 PM	90	166	30	286	84	127	68	279	78	311	99	488	113	246	49	408	1461
05:45 PM	103	156	27	286	80	115	52	247	58	275	74	407	96	174	51	321	1261
Total	446	695	122	1263	338	481	247	1066	291	1269	348	1908	394	986	250	1630	5867
Grand Total	839	1415	233	2487	649	980	521	2150	514	2278	656	3448	755	1795	523	3073	11158
Apprch %	33.7	56.9	9.4		30.2	45.6	24.2		14.9	66.1	19		24.6	58.4	17		
Total %	7.5	12.7	2.1	22.3	5.8	8.8	4.7	19.3	4.6	20.4	5.9	30.9	6.8	16.1	4.7	27.5	

	Milliken Avenue Southbound				Fourth Street Westbound				Milliken Avenue Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	108	**202**	28	338	71	**134**	**69**	274	52	279	78	409	75	215	48	338	1359
05:00 PM	**133**	197	**38**	**368**	**93**	110	58	261	**80**	309	82	471	83	271	64	418	1518
05:15 PM	120	176	27	323	81	129	69	**279**	75	**374**	93	**542**	102	**295**	**86**	**483**	**1627**
05:30 PM	90	166	30	286	84	127	68	279	78	311	**99**	488	**113**	246	49	408	1461
Total Volume	451	741	123	1315	329	500	264	1093	285	1273	352	1910	373	1027	247	1647	5965
% App. Total	34.3	56.3	9.4		30.1	45.7	24.2		14.9	66.6	18.4		22.6	62.4	15		
PHF	.848	.917	.809	.893	.884	.933	.957	.979	.891	.851	.889	.881	.825	.870	.718	.852	.917

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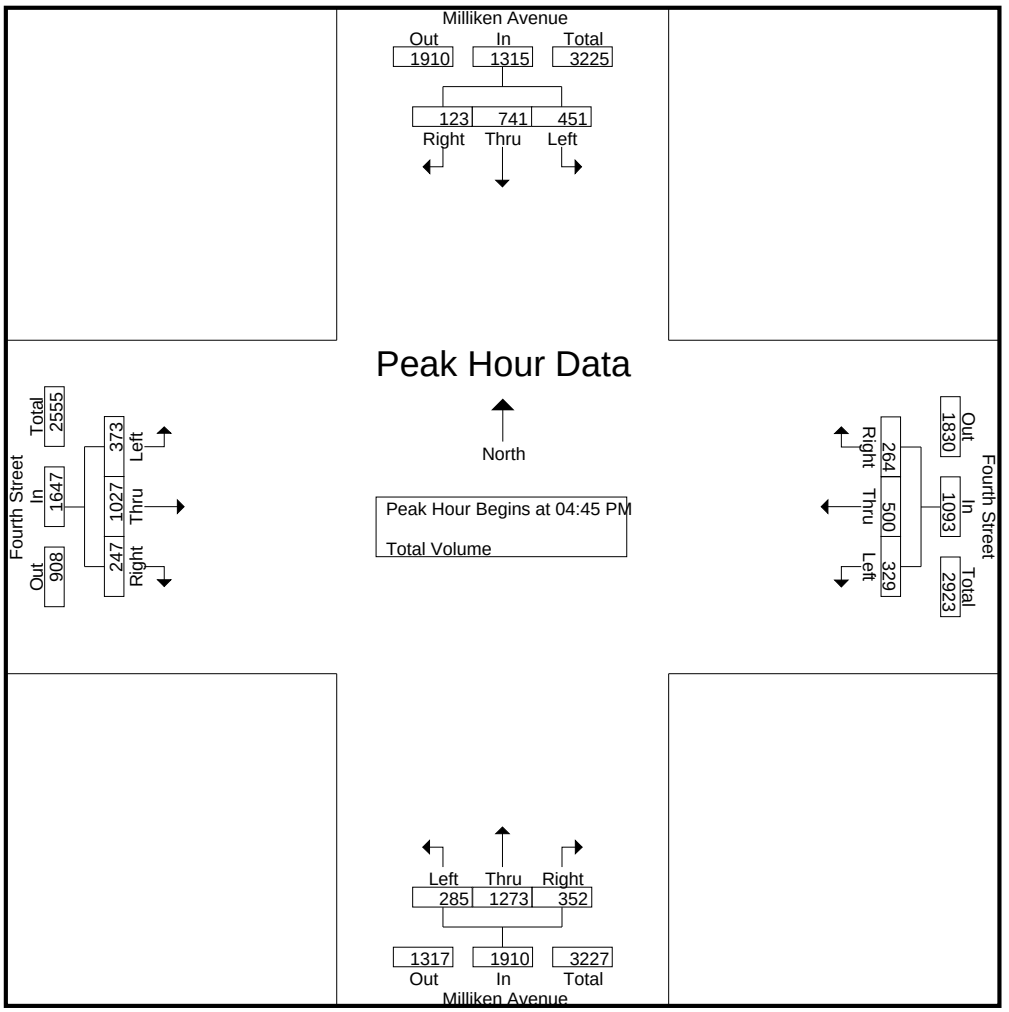
Weather: Clear

File Name : RNCMI4TPM
Site Code : 04216253
Start Date : 7/6/2016
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	103	**202**	**42**	347	71	**134**	**69**	274	52	279	78	409	75	215	48	338
+15 mins.	108	202	28	338	**93**	110	58	261	**80**	309	82	471	83	271	64	418
+30 mins.	**133**	197	38	**368**	81	129	69	**279**	75	**374**	93	**542**	102	**295**	**86**	**483**
+45 mins.	120	176	27	323	84	127	68	279	78	311	**99**	488	**113**	246	49	408
Total Volume	464	777	135	1376	329	500	264	1093	285	1273	352	1910	373	1027	247	1647
% App. Total	33.7	56.5	9.8		30.1	45.7	24.2		14.9	66.6	18.4		22.6	62.4	15	
PHF	.872	.962	.804	.935	.884	.933	.957	.979	.891	.851	.889	.881	.825	.870	.718	.852

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City of Ontario
N/S: Milliken Avenue
E/W: 4th Street
Weather: Clear

File Name : ONT_Milliken_4th_AM
Site Code : 10521447
Start Date : 8/31/2021
Page No : 1

Groups Printed- Total Volume

	Milliken Avenue Southbound				4th Street Westbound				Milliken Avenue Northbound				4th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	31	90	5	126	94	172	46	312	22	101	28	151	20	51	20	91	680
07:15 AM	38	111	11	160	80	158	57	295	30	113	21	164	21	38	20	79	698
07:30 AM	35	127	17	179	84	245	79	408	28	156	32	216	16	69	16	101	904
07:45 AM	38	164	15	217	99	190	72	361	40	194	30	264	37	67	18	122	964
Total	142	492	48	682	357	765	254	1376	120	564	111	795	94	225	74	393	3246
08:00 AM	31	121	15	167	80	217	74	371	32	156	24	212	32	60	16	108	858
08:15 AM	36	167	20	223	64	183	53	300	41	156	17	214	19	73	22	114	851
08:30 AM	37	165	17	219	82	196	52	330	28	114	20	162	20	58	18	96	807
08:45 AM	49	133	19	201	84	192	71	347	27	148	23	198	33	78	21	132	878
Total	153	586	71	810	310	788	250	1348	128	574	84	786	104	269	77	450	3394
Grand Total	295	1078	119	1492	667	1553	504	2724	248	1138	195	1581	198	494	151	843	6640
Apprch %	19.8	72.3	8		24.5	57	18.5		15.7	72	12.3		23.5	58.6	17.9		
Total %	4.4	16.2	1.8	22.5	10	23.4	7.6	41	3.7	17.1	2.9	23.8	3	7.4	2.3	12.7	

	Milliken Avenue Southbound				4th Street Westbound				Milliken Avenue Northbound				4th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	35	127	17	179	84	**245**	**79**	**408**	28	156	**32**	216	16	69	16	101	904
07:45 AM	**38**	164	15	217	**99**	190	72	361	40	**194**	30	**264**	**37**	67	18	**122**	**964**
08:00 AM	31	121	15	167	80	217	74	371	32	156	24	212	32	60	16	108	858
08:15 AM	36	**167**	**20**	**223**	64	183	53	300	**41**	156	17	214	19	**73**	**22**	114	851
Total Volume	140	579	67	786	327	835	278	1440	141	662	103	906	104	269	72	445	3577
% App. Total	17.8	73.7	8.5		22.7	58	19.3		15.6	73.1	11.4		23.4	60.4	16.2		
PHF	.921	.867	.838	.881	.826	.852	.880	.882	.860	.853	.805	.858	.703	.921	.818	.912	.928

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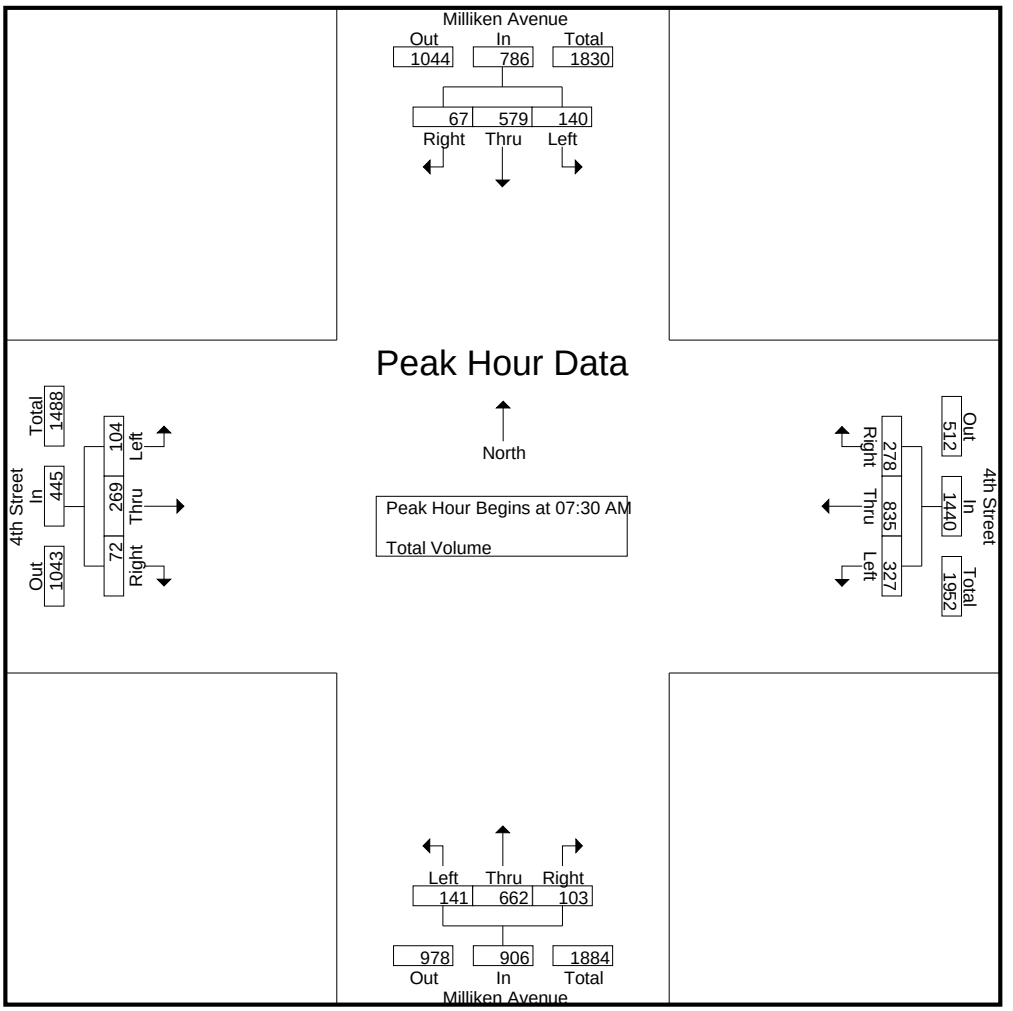
City of Ontario
N/S: Milliken Avenue
E/W: 4th Street
Weather: Clear

File Name : ONT_Milliken_4th_AM
Site Code : 10521447
Start Date : 8/31/2021
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:30 AM				07:30 AM				08:00 AM			
+0 mins.	**38**	164	15	217	84	**245**	**79**	**408**	28	156	**32**	216	32	60	16	108
+15 mins.	31	121	15	167	**99**	190	72	361	40	**194**	30	**264**	19	73	**22**	114
+30 mins.	36	**167**	**20**	**223**	80	217	74	371	32	156	24	212	20	58	18	96
+45 mins.	37	165	17	219	64	183	53	300	**41**	156	17	214	**33**	**78**	21	**132**
Total Volume	142	617	67	826	327	835	278	1440	141	662	103	906	104	269	77	450
% App. Total	17.2	74.7	8.1		22.7	58	19.3		15.6	73.1	11.4		23.1	59.8	17.1	
PHF	.934	.924	.838	.926	.826	.852	.880	.882	.860	.853	.805	.858	.788	.862	.875	.852

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City of Ontario
N/S: Milliken Avenue
E/W: 4th Street
Weather: Clear

File Name : ONT_Milliken_4th_PM
Site Code : 10521447
Start Date : 8/31/2021
Page No : 1

Groups Printed- Total Volume

	Milliken Avenue Southbound				4th Street Westbound				Milliken Avenue Northbound				4th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	71	125	24	220	92	114	44	250	45	247	77	369	71	187	36	294	1133
04:15 PM	88	116	22	226	72	137	44	253	52	230	66	348	58	207	37	302	1129
04:30 PM	83	167	23	273	77	122	46	245	45	256	68	369	60	192	45	297	1184
04:45 PM	86	138	19	243	84	174	56	314	63	240	47	350	79	163	30	272	1179
Total	328	546	88	962	325	547	190	1062	205	973	258	1436	268	749	148	1165	4625
05:00 PM	81	206	22	309	52	127	38	217	46	296	77	419	84	188	43	315	1260
05:15 PM	60	135	35	230	71	159	46	276	45	244	67	356	85	215	41	341	1203
05:30 PM	79	173	26	278	54	140	55	249	60	275	68	403	61	194	32	287	1217
05:45 PM	89	134	22	245	61	121	47	229	59	236	64	359	65	186	41	292	1125
Total	309	648	105	1062	238	547	186	971	210	1051	276	1537	295	783	157	1235	4805
Grand Total	637	1194	193	2024	563	1094	376	2033	415	2024	534	2973	563	1532	305	2400	9430
Apprch %	31.5	59	9.5		27.7	53.8	18.5		14	68.1	18		23.5	63.8	12.7		
Total %	6.8	12.7	2	21.5	6	11.6	4	21.6	4.4	21.5	5.7	31.5	6	16.2	3.2	25.5	

	Milliken Avenue Southbound				4th Street Westbound				Milliken Avenue Northbound				4th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**86**	138	19	243	**84**	**174**	**56**	**314**	**63**	240	47	350	79	163	30	272	1179
05:00 PM	81	**206**	22	**309**	52	127	38	217	46	**296**	**77**	**419**	84	188	**43**	315	**1260**
05:15 PM	60	135	**35**	230	71	159	46	276	45	244	67	356	**85**	**215**	41	**341**	1203
05:30 PM	79	173	26	278	54	140	55	249	60	275	68	403	61	194	32	287	1217
Total Volume	306	652	102	1060	261	600	195	1056	214	1055	259	1528	309	760	146	1215	4859
% App. Total	28.9	61.5	9.6		24.7	56.8	18.5		14	69	17		25.4	62.6	12		
PHF	.890	.791	.729	.858	.777	.862	.871	.841	.849	.891	.841	.912	.909	.884	.849	.891	.964

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City of Ontario
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Weather: Clear

File Name : ONT_Milliken_4th_PM
Site Code : 10521447
Start Date : 8/31/2021
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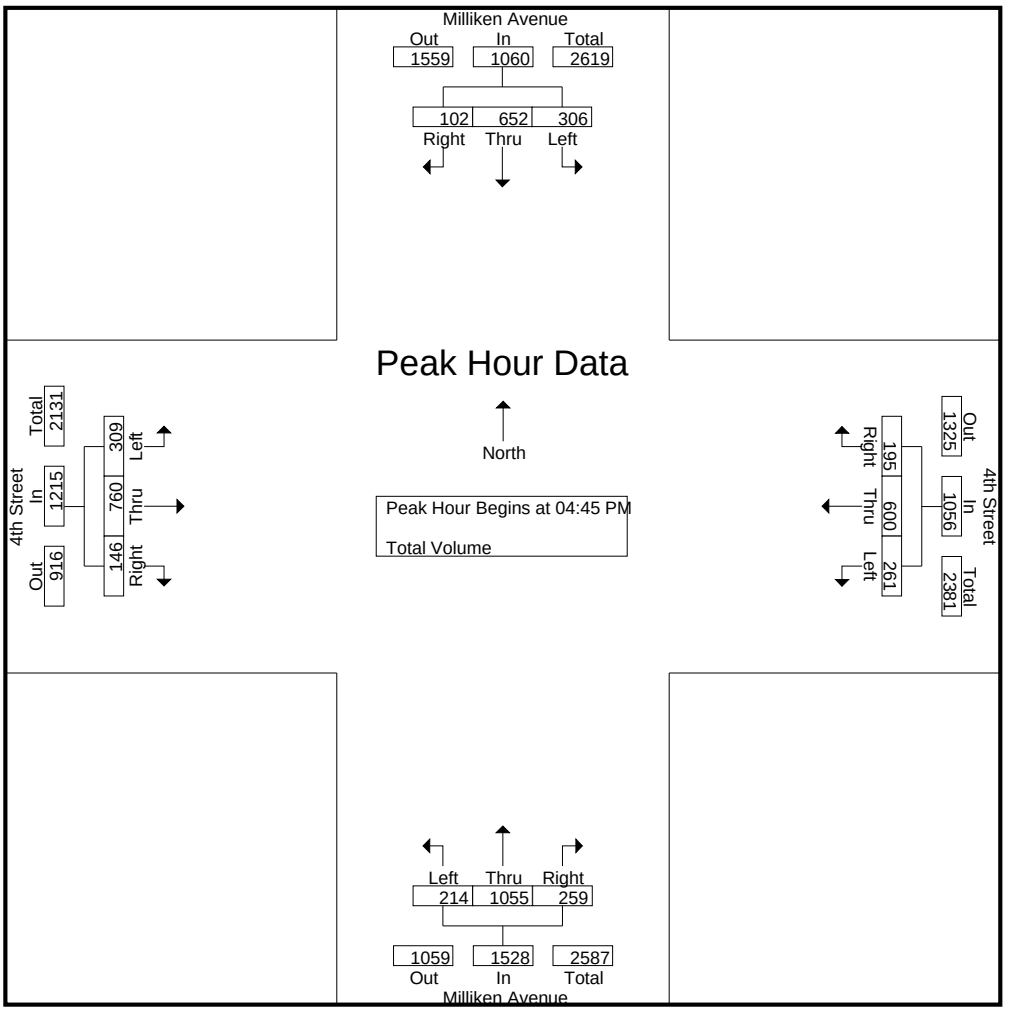

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				04:00 PM				05:00 PM				05:00 PM			
+0 mins.	81	**206**	22	**309**	**92**	114	44	250	46	**296**	**77**	**419**	84	188	**43**	315
+15 mins.	60	135	**35**	230	72	137	44	253	45	244	67	356	**85**	**215**	41	**341**
+30 mins.	79	173	26	278	77	122	46	245	**60**	275	68	403	61	194	32	287
+45 mins.	**89**	134	22	245	84	**174**	**56**	**314**	59	236	64	359	65	186	41	292
Total Volume	309	648	105	1062	325	547	190	1062	210	1051	276	1537	295	783	157	1235
% App. Total	29.1	61	9.9		30.6	51.5	17.9		13.7	68.4	18		23.9	63.4	12.7	
PHF	.868	.786	.750	.859	.883	.786	.848	.846	.875	.888	.896	.917	.868	.910	.913	.905

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City of Rancho Cucamonga
N/S: I-15 Southbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15S4AM
Site Code : 09814452
Start Date : 11/20/2014
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	I-15 Southbound On / Off Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	46	27	153	226	18	161	27	206	16	10	12	38	69	67	8	144	614
07:15 AM	38	44	150	232	28	197	21	246	21	8	15	44	74	75	9	158	680
07:30 AM	25	56	198	279	16	266	33	315	15	14	9	38	68	64	13	145	777
07:45 AM	39	63	220	322	27	290	31	348	17	16	20	53	59	81	19	159	882
Total	148	190	721	1059	89	914	112	1115	69	48	56	173	270	287	49	606	2953
08:00 AM	33	43	141	217	35	264	22	321	14	15	18	47	56	70	10	136	721
08:15 AM	26	24	165	215	14	262	24	300	14	14	18	46	56	64	8	128	689
08:30 AM	27	36	129	192	24	233	36	293	22	5	23	50	50	65	27	142	677
08:45 AM	28	40	146	214	40	214	35	289	13	10	12	35	47	69	5	121	659
Total	114	143	581	838	113	973	117	1203	63	44	71	178	209	268	50	527	2746
Grand Total	262	333	1302	1897	202	1887	229	2318	132	92	127	351	479	555	99	1133	5699
Apprch %	13.8	17.6	68.6		8.7	81.4	9.9		37.6	26.2	36.2		42.3	49	8.7		
Total %	4.6	5.8	22.8	33.3	3.5	33.1	4	40.7	2.3	1.6	2.2	6.2	8.4	9.7	1.7	19.9	
Passenger Vehicles	234	330	1285	1849	198	1763	168	2129	128	87	120	335	400	497	94	991	5304
% Passenger Vehicles	89.3	99.1	98.7	97.5	98	93.4	73.4	91.8	97	94.6	94.5	95.4	83.5	89.5	94.9	87.5	93.1
Large 2 Axle Vehicles	2	3	4	9	3	40	18	61	3	3	5	11	36	27	4	67	148
% Large 2 Axle Vehicles	0.8	0.9	0.3	0.5	1.5	2.1	7.9	2.6	2.3	3.3	3.9	3.1	7.5	4.9	4	5.9	2.6
3 Axle Vehicles	1	0	1	2	1	15	4	20	1	1	0	2	2	5	0	7	31
% 3 Axle Vehicles	0.4	0	0.1	0.1	0.5	0.8	1.7	0.9	0.8	1.1	0	0.6	0.4	0.9	0	0.6	0.5
4+ Axle Trucks	25	0	12	37	0	69	39	108	0	1	2	3	41	26	1	68	216
% 4+ Axle Trucks	9.5	0	0.9	2	0	3.7	17	4.7	0	1.1	1.6	0.9	8.6	4.7	1	6	3.8

	I-15 Southbound On / Off Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	25	56	198	279	16	266	**33**	315	15	14	9	38	**68**	64	13	145	777
07:45 AM	**39**	**63**	**220**	**322**	27	**290**	31	**348**	**17**	**16**	**20**	**53**	59	**81**	**19**	**159**	**882**
08:00 AM	33	43	141	217	**35**	264	22	321	14	15	18	47	56	70	10	136	721
08:15 AM	26	24	165	215	14	262	24	300	14	14	18	46	56	64	8	128	689
Total Volume	123	186	724	1033	92	1082	110	1284	60	59	65	184	239	279	50	568	3069
% App. Total	11.9	18	70.1		7.2	84.3	8.6		32.6	32.1	35.3		42.1	49.1	8.8		
PHF	.788	.738	.823	.802	.657	.933	.833	.922	.882	.922	.813	.868	.879	.861	.658	.893	.870

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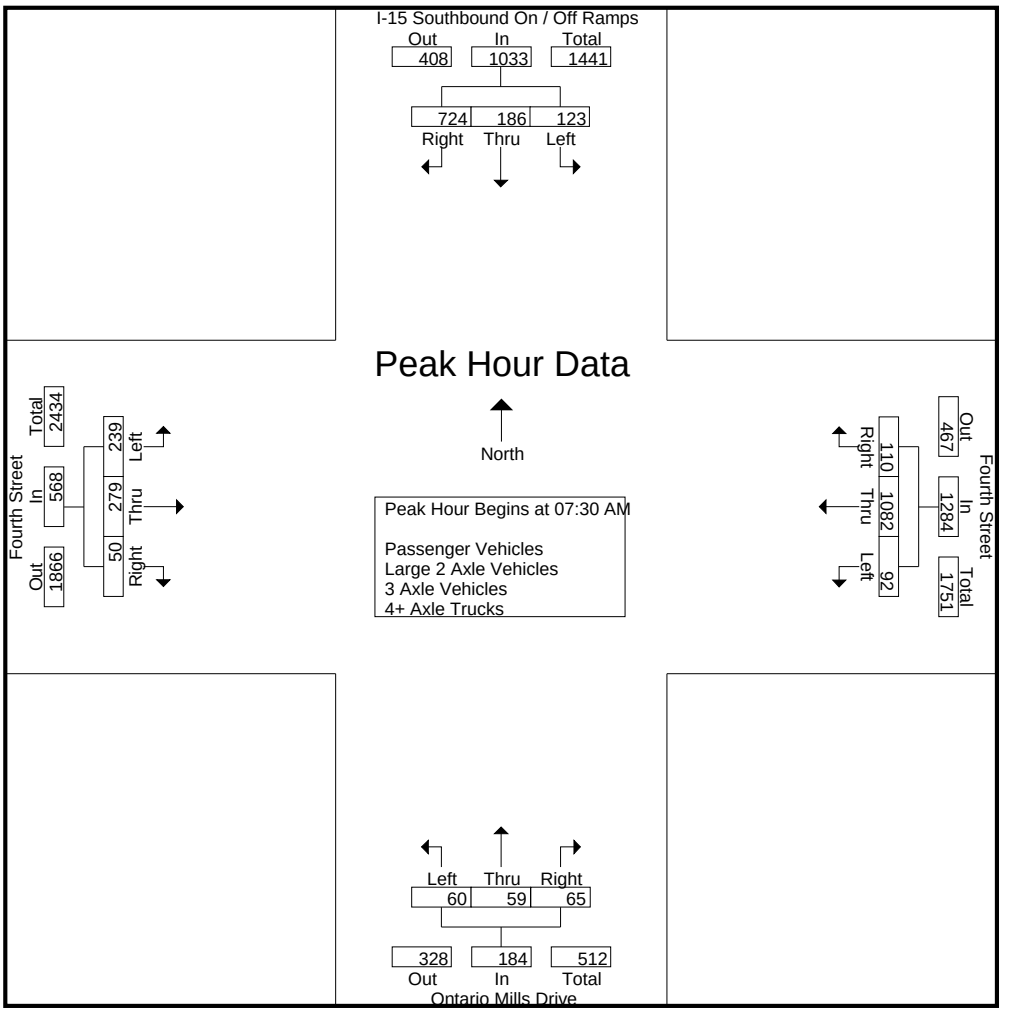
City of Rancho Cucamonga
N/S: I-15 Southbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15S4AM
Site Code : 09814452
Start Date : 11/20/2014
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:30 AM				07:45 AM				07:00 AM			
+0 mins.	**46**	27	153	226	16	266	**33**	315	17	**16**	20	**53**	69	67	8	144
+15 mins.	38	44	150	232	27	**290**	31	**348**	14	15	18	47	**74**	75	9	158
+30 mins.	25	56	198	279	**35**	264	22	321	14	14	18	46	68	64	13	145
+45 mins.	39	**63**	**220**	**322**	14	262	24	300	**22**	5	**23**	50	59	**81**	**19**	**159**
Total Volume	148	190	721	1059	92	1082	110	1284	67	50	79	196	270	287	49	606
% App. Total	14	17.9	68.1		7.2	84.3	8.6		34.2	25.5	40.3		44.6	47.4	8.1	
PHF	.804	.754	.819	.822	.657	.933	.833	.922	.761	.781	.859	.925	.912	.886	.645	.953

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File Name : RNC15S4AM
Site Code : 09814452
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Page No : 1

Groups Printed- Passenger Vehicles

	I-15 Southbound On / Off Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	40	26	152	218	18	153	21	192	16	10	11	37	56	58	8	122	569
07:15 AM	35	44	149	228	27	192	14	233	21	6	15	42	65	68	9	142	645
07:30 AM	23	55	196	274	16	249	25	290	15	13	9	37	57	59	12	128	729
07:45 AM	34	63	219	316	27	280	24	331	17	15	20	52	52	76	19	147	846
Total	132	188	716	1036	88	874	84	1046	69	44	55	168	230	261	48	539	2789
08:00 AM	29	43	139	211	33	246	17	296	12	15	18	45	48	62	9	119	671
08:15 AM	26	24	163	213	14	246	18	278	13	14	14	41	48	58	8	114	646
08:30 AM	23	36	127	186	24	216	23	263	21	5	21	47	41	57	25	123	619
08:45 AM	24	39	140	203	39	181	26	246	13	9	12	34	33	59	4	96	579
Total	102	142	569	813	110	889	84	1083	59	43	65	167	170	236	46	452	2515
Grand Total	234	330	1285	1849	198	1763	168	2129	128	87	120	335	400	497	94	991	5304
Apprch %	12.7	17.8	69.5		9.3	82.8	7.9		38.2	26	35.8		40.4	50.2	9.5		
Total %	4.4	6.2	24.2	34.9	3.7	33.2	3.2	40.1	2.4	1.6	2.3	6.3	7.5	9.4	1.8	18.7	

	I-15 Southbound On / Off Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	23	55	196	274	16	249	**25**	290	15	13	9	37	**57**	59	12	128	729
07:45 AM	**34**	**63**	**219**	**316**	27	**280**	24	**331**	**17**	**15**	**20**	**52**	52	**76**	**19**	**147**	**846**
08:00 AM	29	43	139	211	**33**	246	17	296	12	15	18	45	48	62	9	119	671
08:15 AM	26	24	163	213	14	246	18	278	13	14	14	41	48	58	8	114	646
Total Volume	112	185	717	1014	90	1021	84	1195	57	57	61	175	205	255	48	508	2892
% App. Total	11	18.2	70.7		7.5	85.4	7		32.6	32.6	34.9		40.4	50.2	9.4		
PHF	.824	.734	.818	.802	.682	.912	.840	.903	.838	.950	.763	.841	.899	.839	.632	.864	.855

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City of Rancho Cucamonga
N/S: I-15 Southbound On / Off Ramps
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File Name : RNC15S4AM
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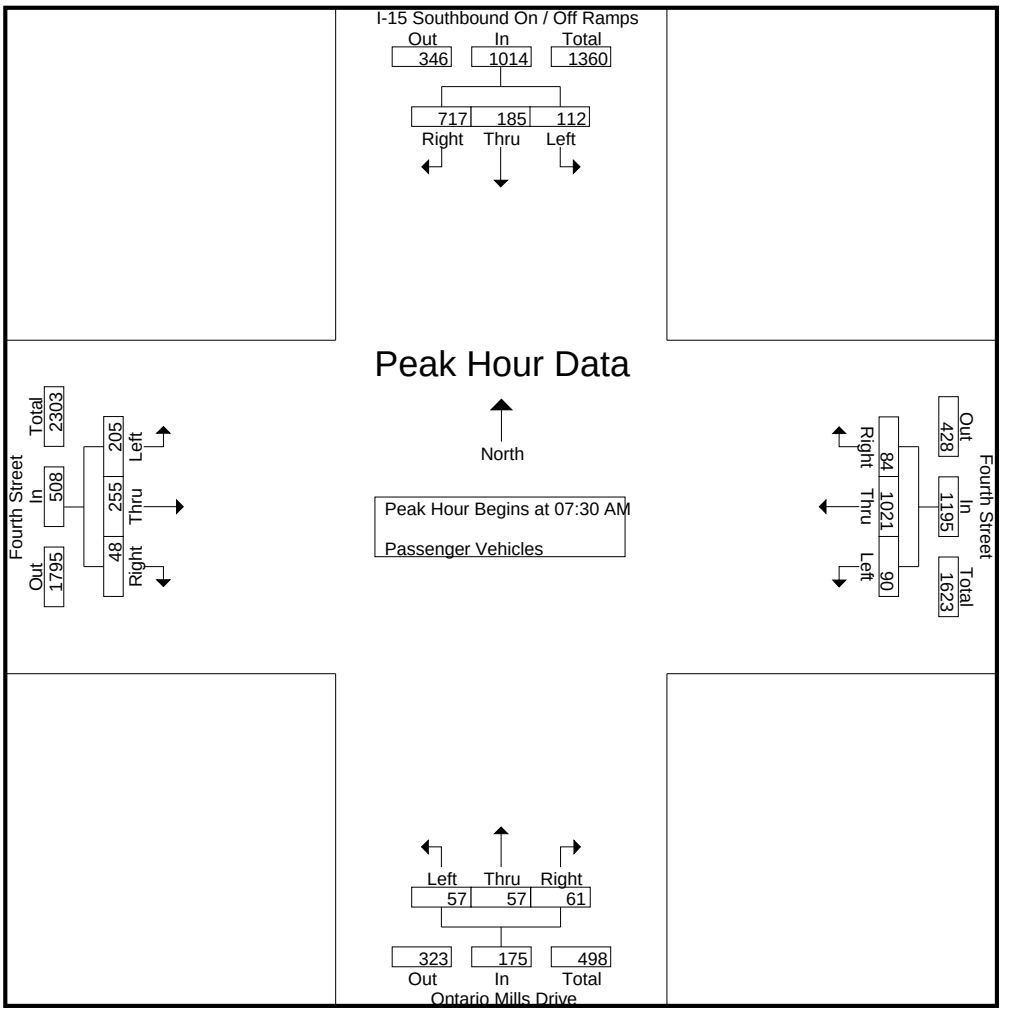

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	23	55	196	274	16	249	**25**	290	15	13	9	37	**57**	59	12	128
+15 mins.	**34**	**63**	**219**	**316**	27	**280**	24	**331**	**17**	**15**	**20**	**52**	52	**76**	**19**	**147**
+30 mins.	29	43	139	211	**33**	246	17	296	12	15	18	45	48	62	9	119
+45 mins.	26	24	163	213	14	246	18	278	13	14	14	41	48	58	8	114
Total Volume	112	185	717	1014	90	1021	84	1195	57	57	61	175	205	255	48	508
% App. Total	11	18.2	70.7		7.5	85.4	7		32.6	32.6	34.9		40.4	50.2	9.4	
PHF	.824	.734	.818	.802	.682	.912	.840	.903	.838	.950	.763	.841	.899	.839	.632	.864

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File Name : RNC15S4AM
Site Code : 09814452
Start Date : 11/20/2014
Page No : 1

Groups Printed- Large 2 Axle Vehicles

	I-15 Southbound On / Off Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	1	0	1	0	3	1	4	0	0	0	0	8	4	0	12	17
07:15 AM	0	0	0	0	1	2	3	6	0	1	0	1	6	5	0	11	18
07:30 AM	0	1	1	2	0	3	3	6	0	1	0	1	3	4	1	8	17
07:45 AM	1	0	0	1	0	4	2	6	0	1	0	1	1	0	0	1	9
Total	1	2	1	4	1	12	9	22	0	3	0	3	18	13	1	32	61
08:00 AM	0	0	0	0	1	5	1	7	1	0	0	1	3	4	1	8	16
08:15 AM	0	0	0	0	0	6	2	8	1	0	3	4	6	4	0	10	22
08:30 AM	0	0	2	2	0	5	2	7	1	0	2	3	3	3	1	7	19
08:45 AM	1	1	1	3	1	12	4	17	0	0	0	0	6	3	1	10	30
Total	1	1	3	5	2	28	9	39	3	0	5	8	18	14	3	35	87
Grand Total	2	3	4	9	3	40	18	61	3	3	5	11	36	27	4	67	148
Apprch %	22.2	33.3	44.4		4.9	65.6	29.5		27.3	27.3	45.5		53.7	40.3	6		
Total %	1.4	2	2.7	6.1	2	27	12.2	41.2	2	2	3.4	7.4	24.3	18.2	2.7	45.3	

	I-15 Southbound On / Off Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	**1**	**1**	**2**	0	3	**3**	6	0	**1**	0	1	3	**4**	**1**	8	17
07:45 AM	**1**	0	0	1	0	4	2	6	0	1	0	1	1	0	0	1	9
08:00 AM	0	0	0	0	**1**	5	1	7	**1**	0	0	1	3	4	1	8	16
08:15 AM	0	0	0	0	0	**6**	2	**8**	1	0	**3**	**4**	**6**	4	0	**10**	**22**
Total Volume	1	1	1	3	1	18	8	27	2	2	3	7	13	12	2	27	64
% App. Total	33.3	33.3	33.3		3.7	66.7	29.6		28.6	28.6	42.9		48.1	44.4	7.4		
PHF	.250	.250	.250	.375	.250	.750	.667	.844	.500	.500	.250	.438	.542	.750	.500	.675	.727

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City of Rancho Cucamonga
N/S: I-15 Southbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15S4AM
Site Code : 09814452
Start Date : 11/20/2014
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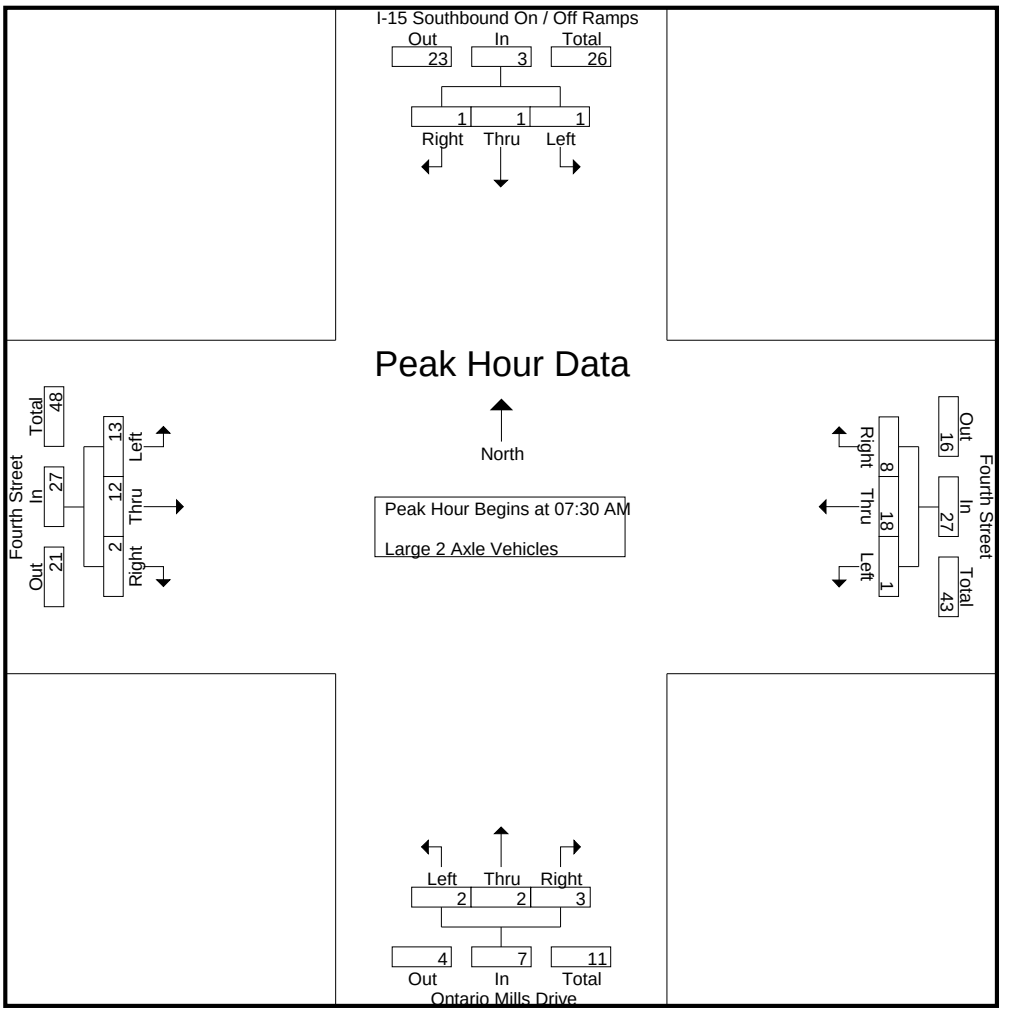

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	**1**	**1**	**2**	0	3	**3**	6	0	**1**	0	1	3	**4**	**1**	8
+15 mins.	**1**	0	0	1	0	4	2	6	0	1	0	1	1	0	0	1
+30 mins.	0	0	0	0	**1**	5	1	7	**1**	0	0	1	3	4	1	8
+45 mins.	0	0	0	0	0	**6**	2	**8**	1	0	**3**	**4**	**6**	4	0	**10**
Total Volume	1	1	1	3	1	18	8	27	2	2	3	7	13	12	2	27
% App. Total	33.3	33.3	33.3		3.7	66.7	29.6		28.6	28.6	42.9		48.1	44.4	7.4	
PHF	.250	.250	.250	.375	.250	.750	.667	.844	.500	.500	.250	.438	.542	.750	.500	.675

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City of Rancho Cucamonga
N/S: I-15 Southbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15S4AM
Site Code : 09814452
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Groups Printed- 3 Axle Vehicles

	I-15 Southbound On / Off Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
07:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	2	1	3	0	0	0	0	0	1	0	1	4
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	1	0	0	1	0	3	1	4	0	0	0	0	1	2	0	3	8
08:00 AM	0	0	1	1	1	5	1	7	1	0	0	1	0	0	0	0	9
08:15 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	1	3
08:30 AM	0	0	0	0	0	1	2	3	0	0	0	0	0	0	0	0	3
08:45 AM	0	0	0	0	0	4	0	4	0	1	0	1	1	2	0	3	8
Total	0	0	1	1	1	12	3	16	1	1	0	2	1	3	0	4	23
Grand Total	1	0	1	2	1	15	4	20	1	1	0	2	2	5	0	7	31
Apprch %	50	0	50		5	75	20		50	50	0		28.6	71.4	0		
Total %	3.2	0	3.2	6.5	3.2	48.4	12.9	64.5	3.2	3.2	0	6.5	6.5	16.1	0	22.6	

	I-15 Southbound On / Off Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	0	2	**1**	3	0	0	0	0	0	**1**	0	**1**	4
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
08:00 AM	0	0	**1**	**1**	**1**	**5**	1	**7**	**1**	0	0	**1**	0	0	0	0	**9**
08:15 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	1	3
Total Volume	0	0	1	1	1	9	2	12	1	0	0	1	0	3	0	3	17
% App. Total	0	0	100		8.3	75	16.7		100	0	0		0	100	0		
PHF	.000	.000	.250	.250	.250	.450	.500	.429	.250	.000	.000	.250	.000	.750	.000	.750	.472

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City of Rancho Cucamonga
N/S: I-15 Southbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15S4AM
Site Code : 09814452
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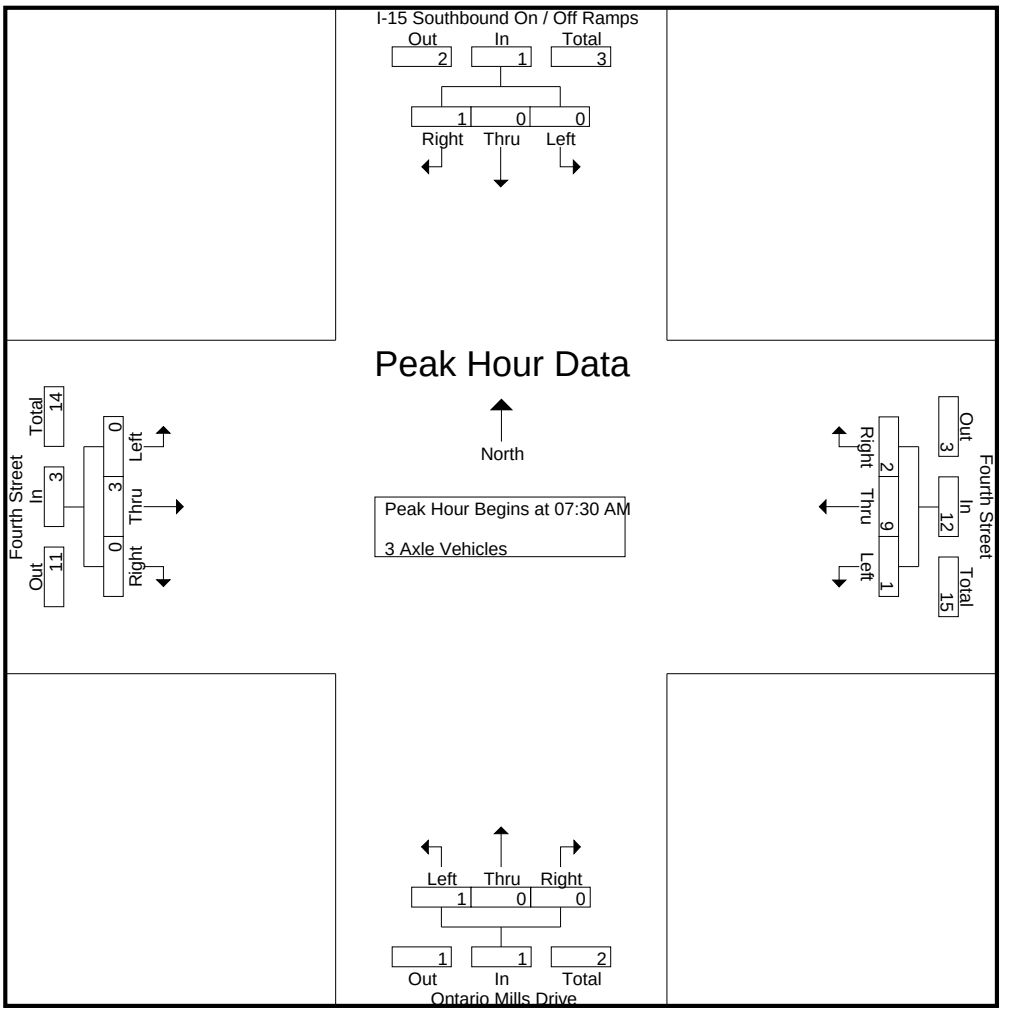

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	0	0	0	0	2	**1**	3	0	0	0	0	0	**1**	0	**1**
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
+30 mins.	0	0	**1**	**1**	**1**	**5**	1	**7**	**1**	0	0	**1**	0	0	0	0
+45 mins.	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	1
Total Volume	0	0	1	1	1	9	2	12	1	0	0	1	0	3	0	3
% App. Total	0	0	100		8.3	75	16.7		100	0	0		0	100	0	
PHF	.000	.000	.250	.250	.250	.450	.500	.429	.250	.000	.000	.250	.000	.750	.000	.750

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City of Rancho Cucamonga
N/S: I-15 Southbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

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Groups Printed- 4+ Axle Trucks

	I-15 Southbound On / Off Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	5	0	1	6	0	5	5	10	0	0	1	1	4	5	0	9	26
07:15 AM	3	0	1	4	0	2	4	6	0	1	0	1	3	2	0	5	16
07:30 AM	2	0	1	3	0	12	4	16	0	0	0	0	8	0	0	8	27
07:45 AM	4	0	1	5	0	6	5	11	0	0	0	0	6	4	0	10	26
Total	14	0	4	18	0	25	18	43	0	1	1	2	21	11	0	32	95
08:00 AM	4	0	1	5	0	8	3	11	0	0	0	0	5	4	0	9	25
08:15 AM	0	0	2	2	0	8	4	12	0	0	1	1	2	1	0	3	18
08:30 AM	4	0	0	4	0	11	9	20	0	0	0	0	6	5	1	12	36
08:45 AM	3	0	5	8	0	17	5	22	0	0	0	0	7	5	0	12	42
Total	11	0	8	19	0	44	21	65	0	0	1	1	20	15	1	36	121
Grand Total	25	0	12	37	0	69	39	108	0	1	2	3	41	26	1	68	216
Apprch %	67.6	0	32.4		0	63.9	36.1		0	33.3	66.7		60.3	38.2	1.5		
Total %	11.6	0	5.6	17.1	0	31.9	18.1	50	0	0.5	0.9	1.4	19	12	0.5	31.5	

	I-15 Southbound On / Off Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	2	0	1	3	0	**12**	4	**16**	0	0	0	0	**8**	0	0	8	**27**
07:45 AM	**4**	0	1	**5**	0	6	**5**	11	0	0	0	0	6	**4**	0	**10**	26
08:00 AM	4	0	1	5	0	8	3	11	0	0	0	0	5	4	0	9	25
08:15 AM	0	0	**2**	2	0	8	4	12	0	0	**1**	**1**	2	1	0	3	18
Total Volume	10	0	5	15	0	34	16	50	0	0	1	1	21	9	0	30	96
% App. Total	66.7	0	33.3		0	68	32		0	0	100		70	30	0		
PHF	.625	.000	.625	.750	.000	.708	.800	.781	.000	.000	.250	.250	.656	.563	.000	.750	.889

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City of Rancho Cucamonga
N/S: I-15 Southbound On / Off Ramps
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Weather: Clear

File Name : RNC15S4AM
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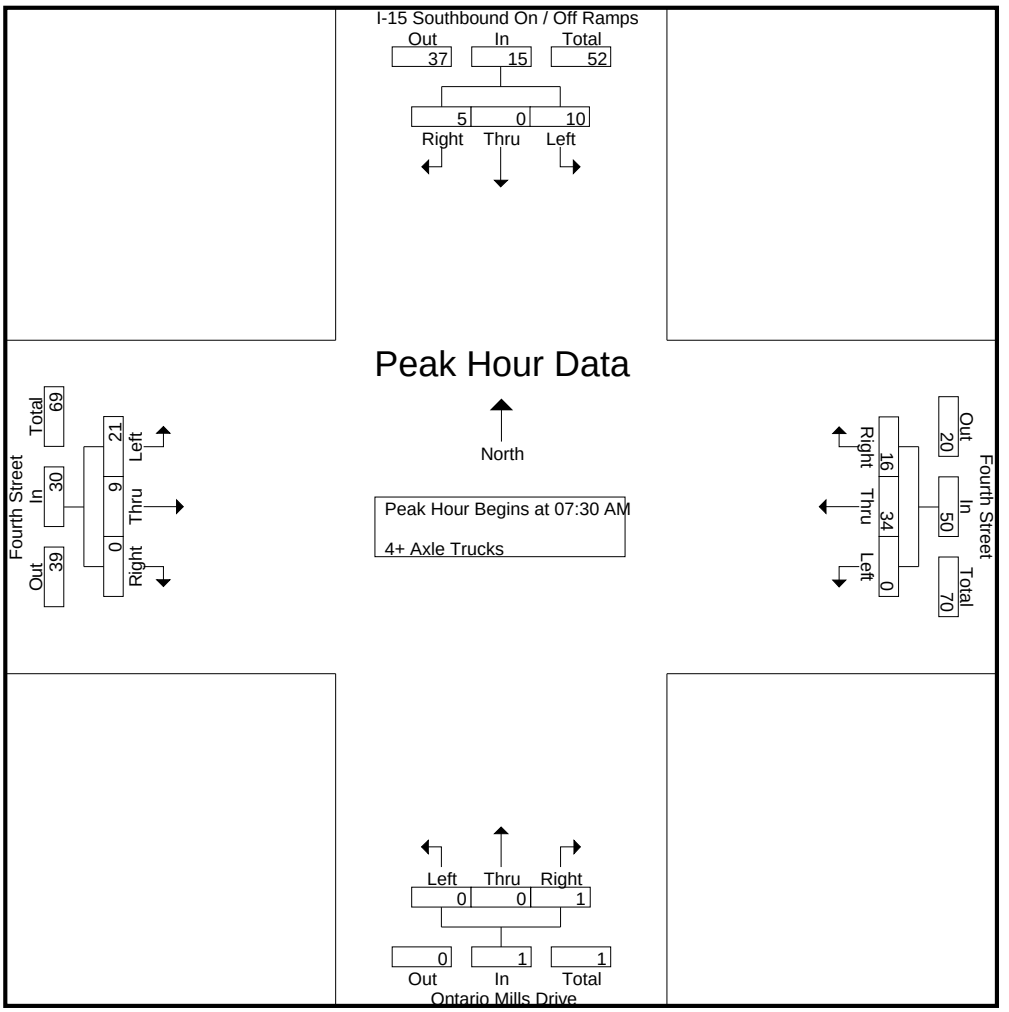

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	2	0	1	3	0	**12**	4	**16**	0	0	0	0	**8**	0	0	8
+15 mins.	**4**	0	1	**5**	0	6	**5**	11	0	0	0	0	6	**4**	0	**10**
+30 mins.	4	0	1	5	0	8	3	11	0	0	0	0	5	4	0	9
+45 mins.	0	0	**2**	2	0	8	4	12	0	0	**1**	**1**	2	1	0	3
Total Volume	10	0	5	15	0	34	16	50	0	0	1	1	21	9	0	30
% App. Total	66.7	0	33.3		0	68	32		0	0	100		70	30	0	
PHF	.625	.000	.625	.750	.000	.708	.800	.781	.000	.000	.250	.250	.656	.563	.000	.750

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City of Rancho Cucamonga
N/S: I-15 Southbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

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Site Code : 09814452
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Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	I-15 Southbound On / Off Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	17	52	113	182	61	163	85	309	29	54	54	137	196	197	24	417	1045
04:15 PM	20	53	96	169	42	187	68	297	24	55	66	145	174	238	18	430	1041
04:30 PM	14	51	116	181	47	170	54	271	22	47	89	158	192	216	31	439	1049
04:45 PM	17	51	121	189	46	178	67	291	24	46	69	139	196	194	19	409	1028
Total	68	207	446	721	196	698	274	1168	99	202	278	579	758	845	92	1695	4163
05:00 PM	12	66	112	190	55	212	81	348	28	88	74	190	210	271	19	500	1228
05:15 PM	14	77	124	215	38	189	79	306	30	77	97	204	221	294	34	549	1274
05:30 PM	20	64	112	196	41	209	62	312	29	55	67	151	200	219	31	450	1109
05:45 PM	19	54	144	217	55	198	39	292	31	39	56	126	169	231	16	416	1051
Total	65	261	492	818	189	808	261	1258	118	259	294	671	800	1015	100	1915	4662
Grand Total	133	468	938	1539	385	1506	535	2426	217	461	572	1250	1558	1860	192	3610	8825
Apprch %	8.6	30.4	60.9		15.9	62.1	22.1		17.4	36.9	45.8		43.2	51.5	5.3		
Total %	1.5	5.3	10.6	17.4	4.4	17.1	6.1	27.5	2.5	5.2	6.5	14.2	17.7	21.1	2.2	40.9	
Passenger Vehicles	105	467	922	1494	383	1420	515	2318	215	459	571	1245	1529	1810	190	3529	8586
% Passenger Vehicles	78.9	99.8	98.3	97.1	99.5	94.3	96.3	95.5	99.1	99.6	99.8	99.6	98.1	97.3	99	97.8	97.3
Large 2 Axle Vehicles	8	0	2	10	1	31	4	36	1	1	0	2	3	13	2	18	66
% Large 2 Axle Vehicles	6	0	0.2	0.6	0.3	2.1	0.7	1.5	0.5	0.2	0	0.2	0.2	0.7	1	0.5	0.7
3 Axle Vehicles	0	1	1	2	1	11	1	13	1	1	1	3	1	13	0	14	32
% 3 Axle Vehicles	0	0.2	0.1	0.1	0.3	0.7	0.2	0.5	0.5	0.2	0.2	0.2	0.1	0.7	0	0.4	0.4
4+ Axle Trucks	20	0	13	33	0	44	15	59	0	0	0	0	25	24	0	49	141
% 4+ Axle Trucks	15	0	1.4	2.1	0	2.9	2.8	2.4	0	0	0	0	1.6	1.3	0	1.4	1.6

	I-15 Southbound On / Off Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	12	66	112	190	**55**	**212**	**81**	**348**	28	**88**	74	190	210	271	19	500	1228
05:15 PM	14	**77**	124	215	38	189	79	306	30	77	**97**	**204**	**221**	**294**	**34**	**549**	**1274**
05:30 PM	**20**	64	112	196	41	209	62	312	29	55	67	151	200	219	31	450	1109
05:45 PM	19	54	**144**	**217**	55	198	39	292	**31**	39	56	126	169	231	16	416	1051
Total Volume	65	261	492	818	189	808	261	1258	118	259	294	671	800	1015	100	1915	4662
% App. Total	7.9	31.9	60.1		15	64.2	20.7		17.6	38.6	43.8		41.8	53	5.2		
PHF	.813	.847	.854	.942	.859	.953	.806	.904	.952	.736	.758	.822	.905	.863	.735	.872	.915

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City of Rancho Cucamonga
N/S: I-15 Southbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15S4PM
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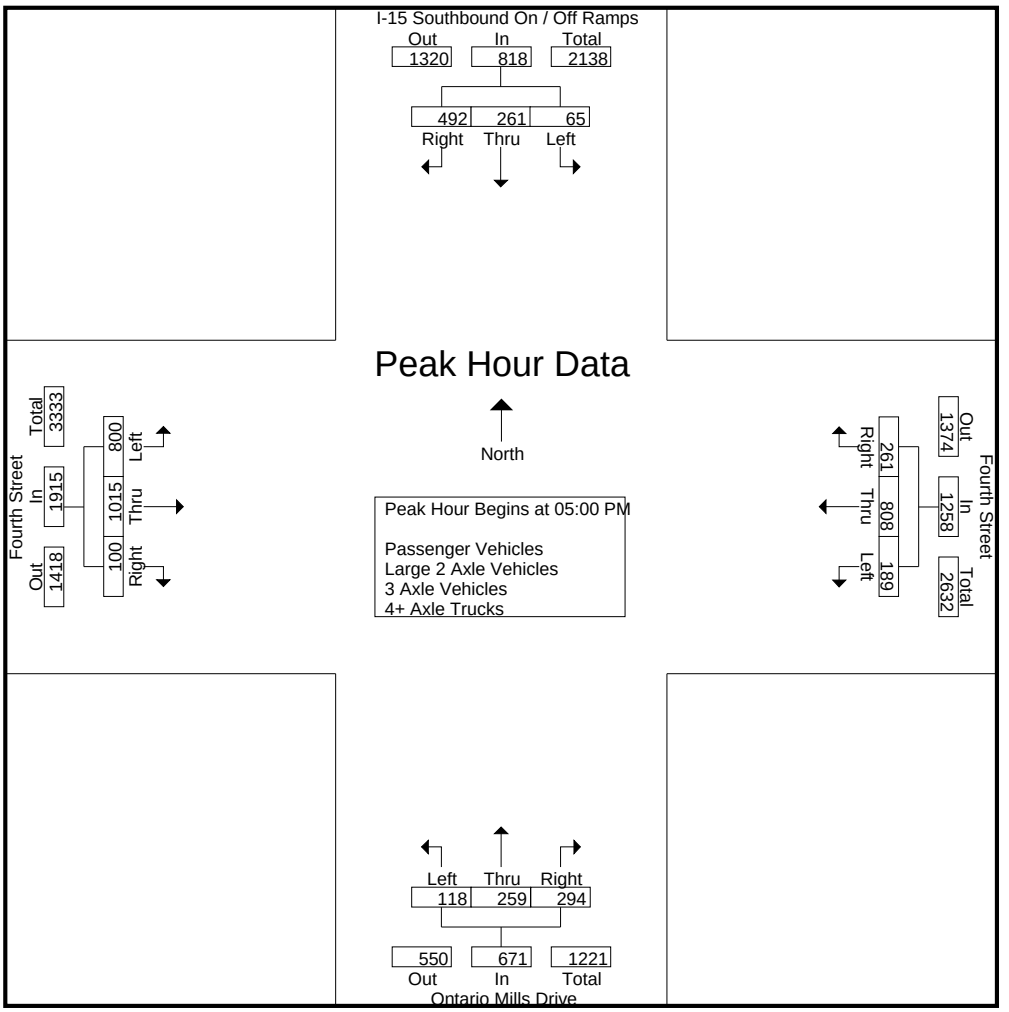

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				04:30 PM				05:00 PM			
+0 mins.	12	66	112	190	**55**	**212**	**81**	**348**	22	47	89	158	210	271	19	500
+15 mins.	14	**77**	124	215	38	189	79	306	24	46	69	139	**221**	**294**	**34**	**549**
+30 mins.	**20**	64	112	196	41	209	62	312	28	**88**	74	190	200	219	31	450
+45 mins.	19	54	**144**	**217**	55	198	39	292	**30**	77	**97**	**204**	169	231	16	416
Total Volume	65	261	492	818	189	808	261	1258	104	258	329	691	800	1015	100	1915
% App. Total	7.9	31.9	60.1		15	64.2	20.7		15.1	37.3	47.6		41.8	53	5.2	
PHF	.813	.847	.854	.942	.859	.953	.806	.904	.867	.733	.848	.847	.905	.863	.735	.872

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City of Rancho Cucamonga
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Groups Printed- Passenger Vehicles

	I-15 Southbound On / Off Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	14	52	109	175	61	154	81	296	28	54	54	136	189	193	24	406	1013
04:15 PM	16	53	95	164	42	170	63	275	24	55	65	144	173	231	17	421	1004
04:30 PM	9	50	115	174	46	159	53	258	22	47	89	158	187	211	30	428	1018
04:45 PM	13	51	120	184	45	163	64	272	24	46	69	139	195	189	19	403	998
Total	52	206	439	697	194	646	261	1101	98	202	277	577	744	824	90	1658	4033
05:00 PM	8	66	108	182	55	202	77	334	27	87	74	188	206	265	19	490	1194
05:15 PM	13	77	123	213	38	183	79	300	30	77	97	204	218	282	34	534	1251
05:30 PM	18	64	110	192	41	200	59	300	29	55	67	151	196	215	31	442	1085
05:45 PM	14	54	142	210	55	189	39	283	31	38	56	125	165	224	16	405	1023
Total	53	261	483	797	189	774	254	1217	117	257	294	668	785	986	100	1871	4553
Grand Total	105	467	922	1494	383	1420	515	2318	215	459	571	1245	1529	1810	190	3529	8586
Apprch %	7	31.3	61.7		16.5	61.3	22.2		17.3	36.9	45.9		43.3	51.3	5.4		
Total %	1.2	5.4	10.7	17.4	4.5	16.5	6	27	2.5	5.3	6.7	14.5	17.8	21.1	2.2	41.1	

	I-15 Southbound On / Off Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	8	66	108	182	**55**	**202**	77	**334**	27	**87**	74	188	206	265	19	490	1194
05:15 PM	13	**77**	123	**213**	38	183	**79**	300	30	77	**97**	**204**	**218**	**282**	**34**	**534**	**1251**
05:30 PM	**18**	64	110	192	41	200	59	300	29	55	67	151	196	215	31	442	1085
05:45 PM	14	54	**142**	210	55	189	39	283	**31**	38	56	125	165	224	16	405	1023
Total Volume	53	261	483	797	189	774	254	1217	117	257	294	668	785	986	100	1871	4553
% App. Total	6.6	32.7	60.6		15.5	63.6	20.9		17.5	38.5	44		42	52.7	5.3		
PHF	.736	.847	.850	.935	.859	.958	.804	.911	.944	.739	.758	.819	.900	.874	.735	.876	.910

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City of Rancho Cucamonga
N/S: I-15 Southbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15S4PM
Site Code : 09814452
Start Date : 11/20/2014
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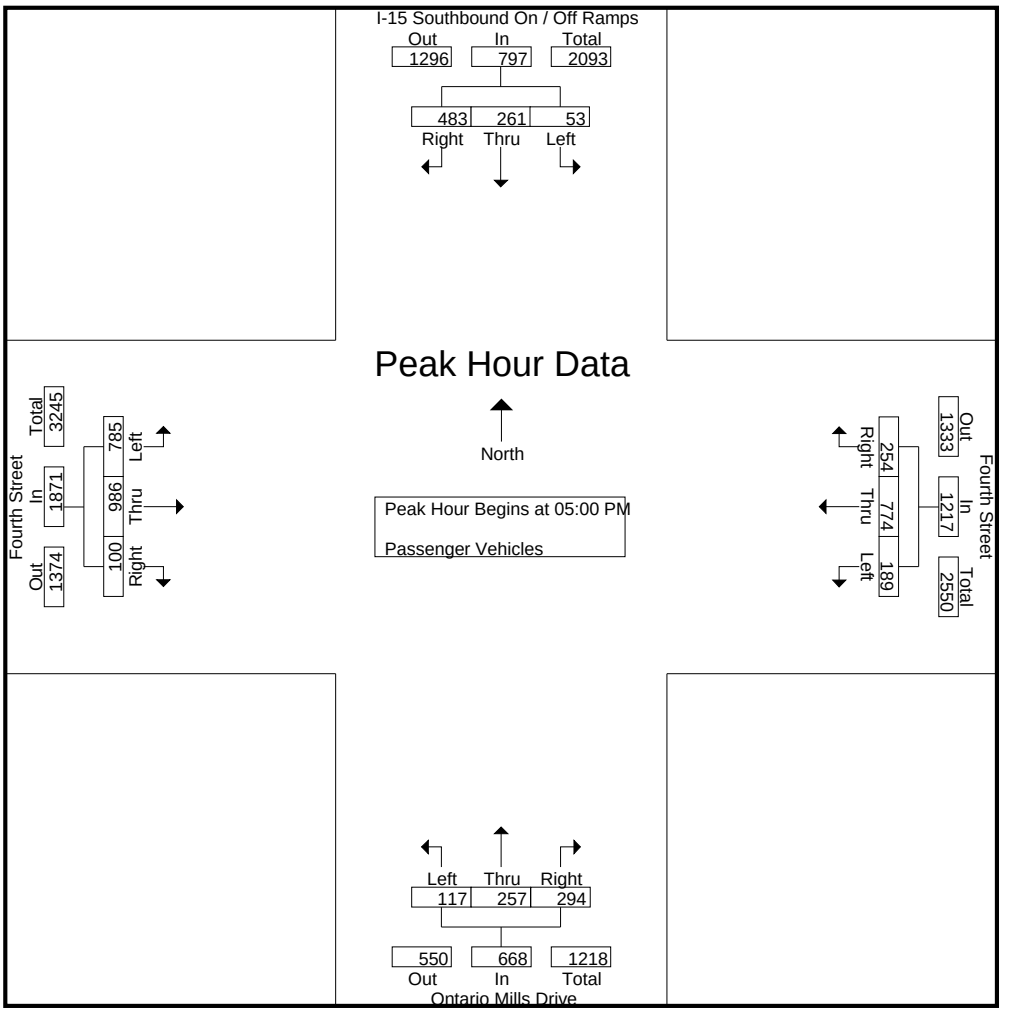

Peak Hour Analysis From 04:45 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				04:45 PM				05:00 PM			
+0 mins.	8	66	108	182	**55**	**202**	77	**334**	24	46	69	139	206	265	19	490
+15 mins.	13	**77**	123	**213**	38	183	**79**	300	27	**87**	74	188	**218**	**282**	**34**	**534**
+30 mins.	**18**	64	110	192	41	200	59	300	**30**	77	**97**	**204**	196	215	31	442
+45 mins.	14	54	**142**	210	55	189	39	283	29	55	67	151	165	224	16	405
Total Volume	53	261	483	797	189	774	254	1217	110	265	307	682	785	986	100	1871
% App. Total	6.6	32.7	60.6		15.5	63.6	20.9		16.1	38.9	45		42	52.7	5.3	
PHF	.736	.847	.850	.935	.859	.958	.804	.911	.917	.761	.791	.836	.900	.874	.735	.876

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City of Rancho Cucamonga
N/S: I-15 Southbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15S4PM
Site Code : 09814452
Start Date : 11/20/2014
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Groups Printed- Large 2 Axle Vehicles

	I-15 Southbound On / Off Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	2	0	0	2	0	3	1	4	1	0	0	1	1	0	0	1	8
04:15 PM	2	0	0	2	0	6	0	6	0	0	0	0	0	2	1	3	11
04:30 PM	3	0	1	4	1	4	0	5	0	0	0	0	1	2	1	4	13
04:45 PM	0	0	0	0	0	5	1	6	0	0	0	0	0	1	0	1	7
Total	7	0	1	8	1	18	2	21	1	0	0	1	2	5	2	9	39
05:00 PM	1	0	1	2	0	4	2	6	0	1	0	1	0	2	0	2	11
05:15 PM	0	0	0	0	0	3	0	3	0	0	0	0	1	3	0	4	7
05:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	1	3
05:45 PM	0	0	0	0	0	4	0	4	0	0	0	0	0	2	0	2	6
Total	1	0	1	2	0	13	2	15	0	1	0	1	1	8	0	9	27
Grand Total	8	0	2	10	1	31	4	36	1	1	0	2	3	13	2	18	66
Apprch %	80	0	20		2.8	86.1	11.1		50	50	0		16.7	72.2	11.1		
Total %	12.1	0	3	15.2	1.5	47	6.1	54.5	1.5	1.5	0	3	4.5	19.7	3	27.3	

	I-15 Southbound On / Off Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	**5**	1	**6**	0	0	0	0	0	1	0	1	7
05:00 PM	**1**	0	**1**	**2**	0	4	**2**	6	0	**1**	0	**1**	0	2	0	2	**11**
05:15 PM	0	0	0	0	0	3	0	3	0	0	0	0	**1**	**3**	0	**4**	7
05:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	1	3
Total Volume	1	0	1	2	0	14	3	17	0	1	0	1	1	7	0	8	28
% App. Total	50	0	50		0	82.4	17.6		0	100	0		12.5	87.5	0		
PHF	.250	.000	.250	.250	.000	.700	.375	.708	.000	.250	.000	.250	.250	.583	.000	.500	.636

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City of Rancho Cucamonga
N/S: I-15 Southbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15S4PM
Site Code : 09814452
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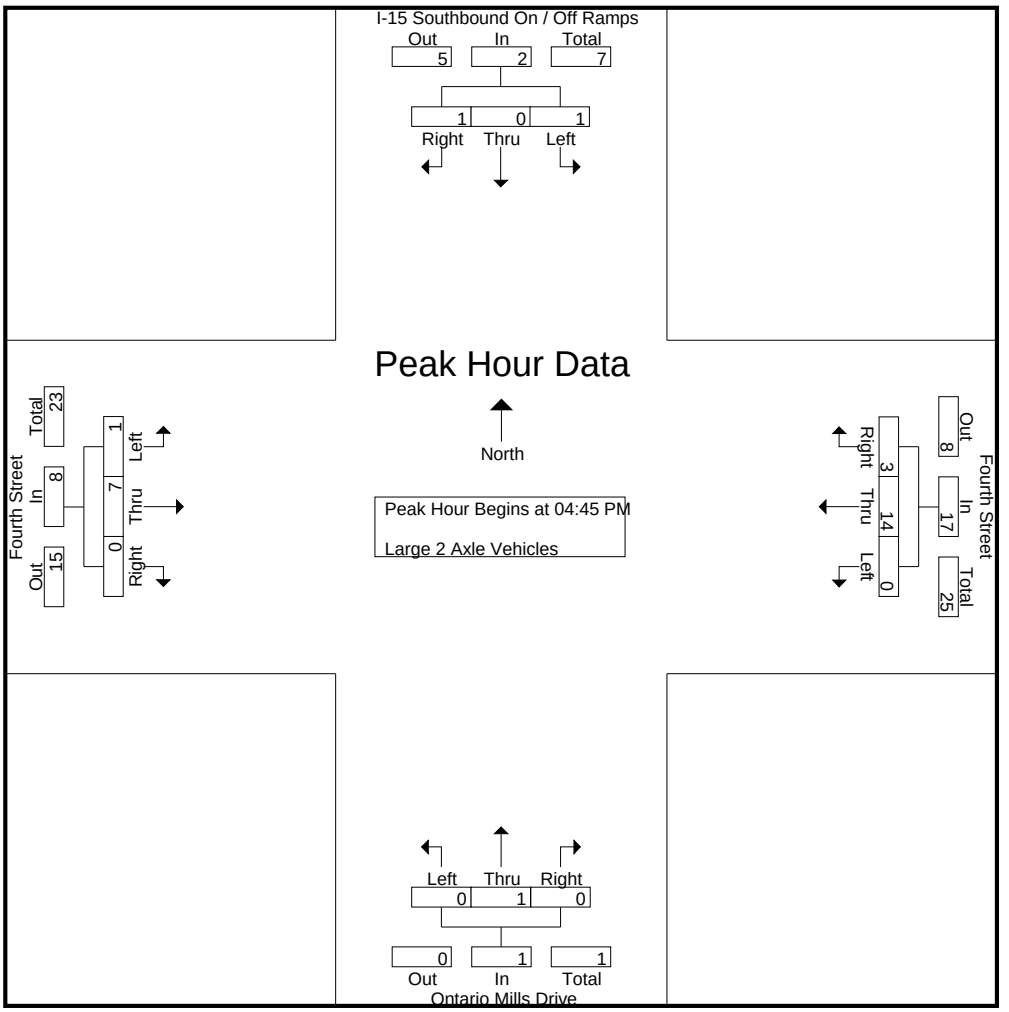

Peak Hour Analysis From 04:45 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				05:00 PM			
+0 mins.	0	0	0	0	0	**5**	1	**6**	0	0	0	0	0	2	0	2
+15 mins.	**1**	0	**1**	**2**	0	4	**2**	6	0	**1**	0	**1**	**1**	**3**	0	**4**
+30 mins.	0	0	0	0	0	3	0	3	0	0	0	0	0	1	0	1
+45 mins.	0	0	0	0	0	2	0	2	0	0	0	0	0	2	0	2
Total Volume	1	0	1	2	0	14	3	17	0	1	0	1	1	8	0	9
% App. Total	50	0	50		0	82.4	17.6		0	100	0		11.1	88.9	0	
PHF	.250	.000	.250	.250	.000	.700	.375	.708	.000	.250	.000	.250	.250	.667	.000	.563

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City of Rancho Cucamonga
N/S: I-15 Southbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

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Groups Printed- 3 Axle Vehicles

	I-15 Southbound On / Off Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
04:15 PM	0	0	0	0	0	2	0	2	0	0	1	1	0	1	0	1	4
04:30 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	2	0	2	4
04:45 PM	0	0	0	0	1	2	0	3	0	0	0	0	0	0	0	0	3
Total	0	1	0	1	1	5	0	6	0	0	1	1	0	4	0	4	12
05:00 PM	0	0	1	1	0	3	1	4	1	0	0	1	0	1	0	1	7
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	5
05:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	1	3
05:45 PM	0	0	0	0	0	1	0	1	0	1	0	1	1	2	0	3	5
Total	0	0	1	1	0	6	1	7	1	1	0	2	1	9	0	10	20
Grand Total	0	1	1	2	1	11	1	13	1	1	1	3	1	13	0	14	32
Apprch %	0	50	50		7.7	84.6	7.7		33.3	33.3	33.3		7.1	92.9	0		
Total %	0	3.1	3.1	6.2	3.1	34.4	3.1	40.6	3.1	3.1	3.1	9.4	3.1	40.6	0	43.8	

	I-15 Southbound On / Off Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	**1**	**1**	0	**3**	**1**	**4**	**1**	0	0	**1**	0	1	0	1	**7**
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**5**	0	**5**	5
05:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	1	3
05:45 PM	0	0	0	0	0	1	0	1	0	**1**	0	1	**1**	2	0	3	5
Total Volume	0	0	1	1	0	6	1	7	1	1	0	2	1	9	0	10	20
% App. Total	0	0	100		0	85.7	14.3		50	50	0		10	90	0		
PHF	.000	.000	.250	.250	.000	.500	.250	.438	.250	.250	.000	.500	.250	.450	.000	.500	.714

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City of Rancho Cucamonga
N/S: I-15 Southbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15S4PM
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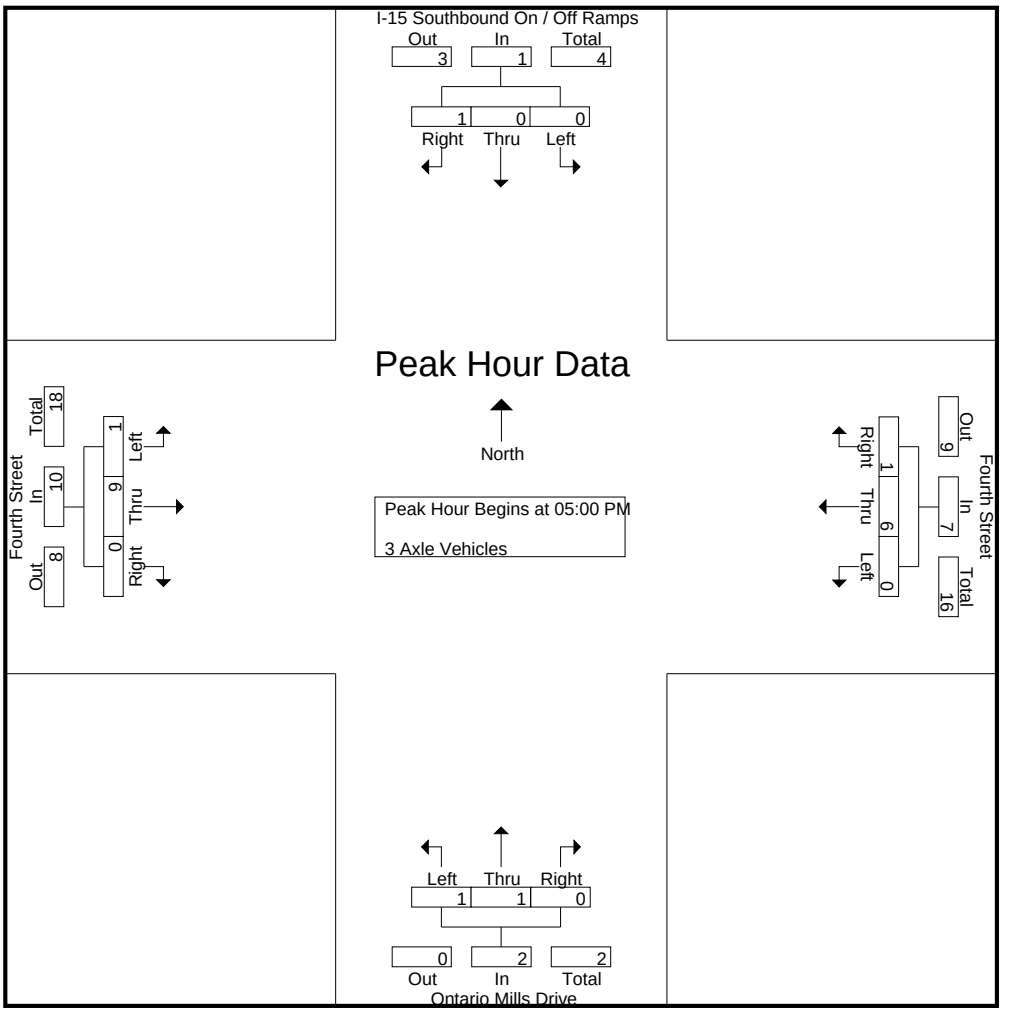

Peak Hour Analysis From 04:45 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				05:00 PM				05:00 PM			
+0 mins.	0	0	0	0	**1**	2	0	3	**1**	0	0	**1**	0	1	0	1
+15 mins.	0	0	**1**	**1**	0	**3**	**1**	**4**	0	0	0	0	0	**5**	0	**5**
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
+45 mins.	0	0	0	0	0	2	0	2	0	**1**	0	1	**1**	2	0	3
Total Volume	0	0	1	1	1	7	1	9	1	1	0	2	1	9	0	10
% App. Total	0	0	100		11.1	77.8	11.1		50	50	0		10	90	0	
PHF	.000	.000	.250	.250	.250	.583	.250	.563	.250	.250	.000	.500	.250	.450	.000	.500

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City of Rancho Cucamonga
N/S: I-15 Southbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15S4PM
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Groups Printed- 4+ Axle Trucks

	I-15 Southbound On / Off Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	1	0	4	5	0	6	3	9	0	0	0	0	6	3	0	9	23
04:15 PM	2	0	1	3	0	9	5	14	0	0	0	0	1	4	0	5	22
04:30 PM	2	0	0	2	0	6	1	7	0	0	0	0	4	1	0	5	14
04:45 PM	4	0	1	5	0	8	2	10	0	0	0	0	1	4	0	5	20
Total	9	0	6	15	0	29	11	40	0	0	0	0	12	12	0	24	79
05:00 PM	3	0	2	5	0	3	1	4	0	0	0	0	4	3	0	7	16
05:15 PM	1	0	1	2	0	3	0	3	0	0	0	0	2	4	0	6	11
05:30 PM	2	0	2	4	0	5	3	8	0	0	0	0	4	2	0	6	18
05:45 PM	5	0	2	7	0	4	0	4	0	0	0	0	3	3	0	6	17
Total	11	0	7	18	0	15	4	19	0	0	0	0	13	12	0	25	62
Grand Total	20	0	13	33	0	44	15	59	0	0	0	0	25	24	0	49	141
Apprch %	60.6	0	39.4		0	74.6	25.4		0	0	0		51	49	0		
Total %	14.2	0	9.2	23.4	0	31.2	10.6	41.8	0	0	0	0	17.7	17	0	34.8	

	I-15 Southbound On / Off Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**4**	0	1	**5**	0	**8**	2	**10**	0	0	0	0	1	**4**	0	5	**20**
05:00 PM	3	0	**2**	5	0	3	1	4	0	0	0	0	**4**	3	0	**7**	16
05:15 PM	1	0	1	2	0	3	0	3	0	0	0	0	2	4	0	6	11
05:30 PM	2	0	2	4	0	5	**3**	8	0	0	0	0	4	2	0	6	18
Total Volume	10	0	6	16	0	19	6	25	0	0	0	0	11	13	0	24	65
% App. Total	62.5	0	37.5		0	76	24		0	0	0		45.8	54.2	0		
PHF	.625	.000	.750	.800	.000	.594	.500	.625	.000	.000	.000	.000	.688	.813	.000	.857	.813

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City of Rancho Cucamonga
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Weather: Clear

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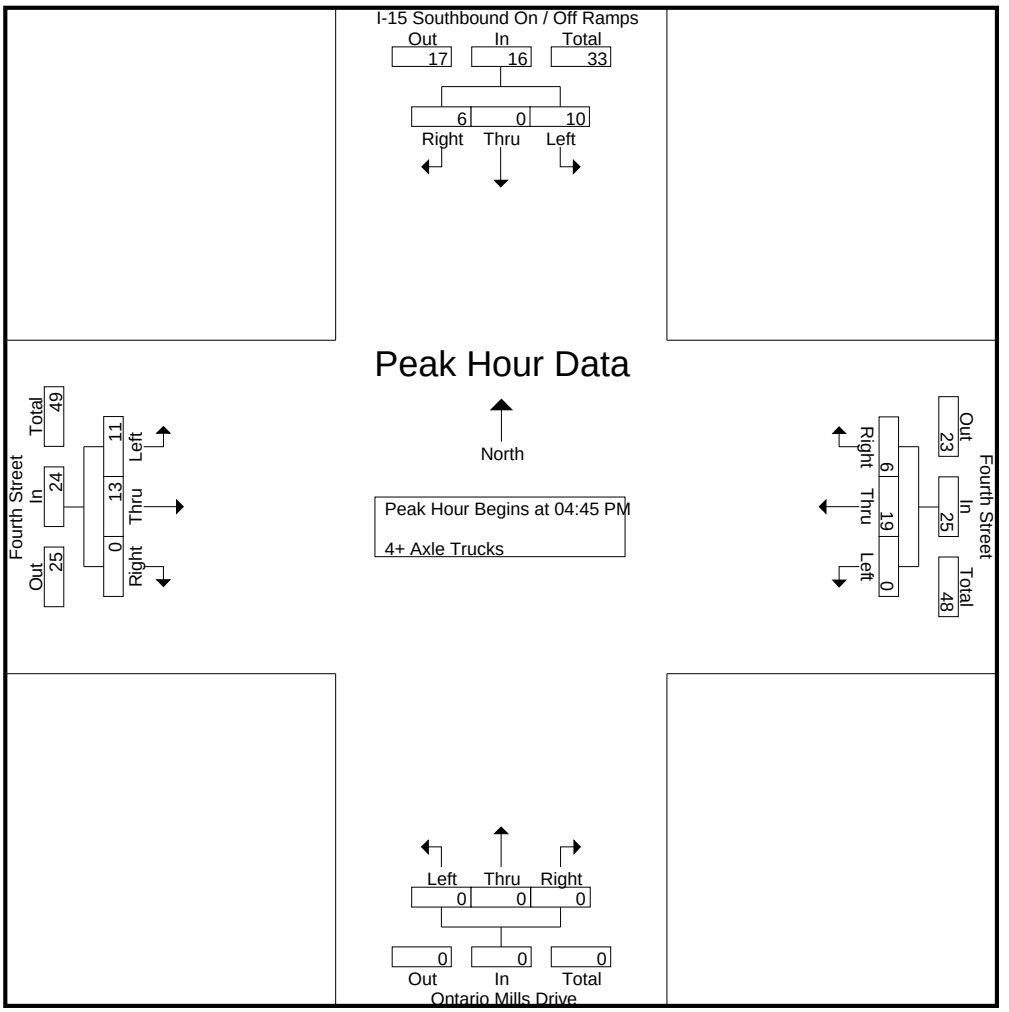

Peak Hour Analysis From 04:45 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				04:45 PM				04:45 PM				05:00 PM			
+0 mins.	3	0	**2**	5	0	**8**	2	**10**	0	0	0	0	**4**	3	0	**7**
+15 mins.	1	0	1	2	0	3	1	4	0	0	0	0	2	**4**	0	6
+30 mins.	2	0	2	4	0	3	0	3	0	0	0	0	4	2	0	6
+45 mins.	**5**	0	2	**7**	0	5	**3**	8	0	0	0	0	3	3	0	6
Total Volume	11	0	7	18	0	19	6	25	0	0	0	0	13	12	0	25
% App. Total	61.1	0	38.9		0	76	24		0	0	0		52	48	0	
PHF	.550	.000	.875	.643	.000	.594	.500	.625	.000	.000	.000	.000	.813	.750	.000	.893

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City of Rancho Cucamonga
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E/W: Fourth Street
Weather: Clear

File Name : RNC15N4AM
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Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	I-15 Northbound On / Off Ramps Southbound				Fourth Street Westbound				Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	63	19	129	211	13	75	10	98	13	10	10	33	41	67	15	123	465
07:15 AM	36	16	158	210	8	70	9	87	18	1	8	27	47	75	8	130	454
07:30 AM	62	18	193	273	9	109	13	131	29	3	13	45	32	61	12	105	554
07:45 AM	79	16	194	289	9	112	7	128	24	5	16	45	41	80	23	144	606
Total	240	69	674	983	39	366	39	444	84	19	47	150	161	283	58	502	2079
08:00 AM	86	9	202	297	15	87	16	118	23	6	9	38	43	67	18	128	581
08:15 AM	83	12	215	310	4	84	16	104	16	4	10	30	36	65	11	112	556
08:30 AM	53	11	182	246	11	79	13	103	23	6	10	39	39	60	16	115	503
08:45 AM	67	11	184	262	12	93	14	119	19	10	6	35	35	56	11	102	518
Total	289	43	783	1115	42	343	59	444	81	26	35	142	153	248	56	457	2158
Grand Total	529	112	1457	2098	81	709	98	888	165	45	82	292	314	531	114	959	4237
Apprch %	25.2	5.3	69.4		9.1	79.8	11		56.5	15.4	28.1		32.7	55.4	11.9		
Total %	12.5	2.6	34.4	49.5	1.9	16.7	2.3	21	3.9	1.1	1.9	6.9	7.4	12.5	2.7	22.6	
Passenger Vehicles	453	105	1373	1931	74	611	74	759	159	42	77	278	293	459	111	863	3831
% Passenger Vehicles	85.6	93.8	94.2	92	91.4	86.2	75.5	85.5	96.4	93.3	93.9	95.2	93.3	86.4	97.4	90	90.4
Large 2 Axle Vehicles	18	1	24	43	5	34	9	48	2	2	1	5	13	21	1	35	131
% Large 2 Axle Vehicles	3.4	0.9	1.6	2	6.2	4.8	9.2	5.4	1.2	4.4	1.2	1.7	4.1	4	0.9	3.6	3.1
3 Axle Vehicles	5	1	3	9	1	15	0	16	1	1	1	3	0	6	1	7	35
% 3 Axle Vehicles	0.9	0.9	0.2	0.4	1.2	2.1	0	1.8	0.6	2.2	1.2	1	0	1.1	0.9	0.7	0.8
4+ Axle Trucks	53	5	57	115	1	49	15	65	3	0	3	6	8	45	1	54	240
% 4+ Axle Trucks	10	4.5	3.9	5.5	1.2	6.9	15.3	7.3	1.8	0	3.7	2.1	2.5	8.5	0.9	5.6	5.7

	I-15 Northbound On / Off Ramps Southbound				Fourth Street Westbound				Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	62	**18**	193	273	9	109	13	**131**	**29**	3	13	**45**	32	61	12	105	554
07:45 AM	79	16	194	289	9	**112**	7	128	24	5	**16**	45	41	**80**	**23**	**144**	**606**
08:00 AM	**86**	9	202	297	**15**	87	**16**	118	23	**6**	9	38	**43**	67	18	128	581
08:15 AM	83	12	**215**	**310**	4	84	16	104	16	4	10	30	36	65	11	112	556
Total Volume	310	55	804	1169	37	392	52	481	92	18	48	158	152	273	64	489	2297
% App. Total	26.5	4.7	68.8		7.7	81.5	10.8		58.2	11.4	30.4		31.1	55.8	13.1		
PHF	.901	.764	.935	.943	.617	.875	.813	.918	.793	.750	.750	.878	.884	.853	.696	.849	.948

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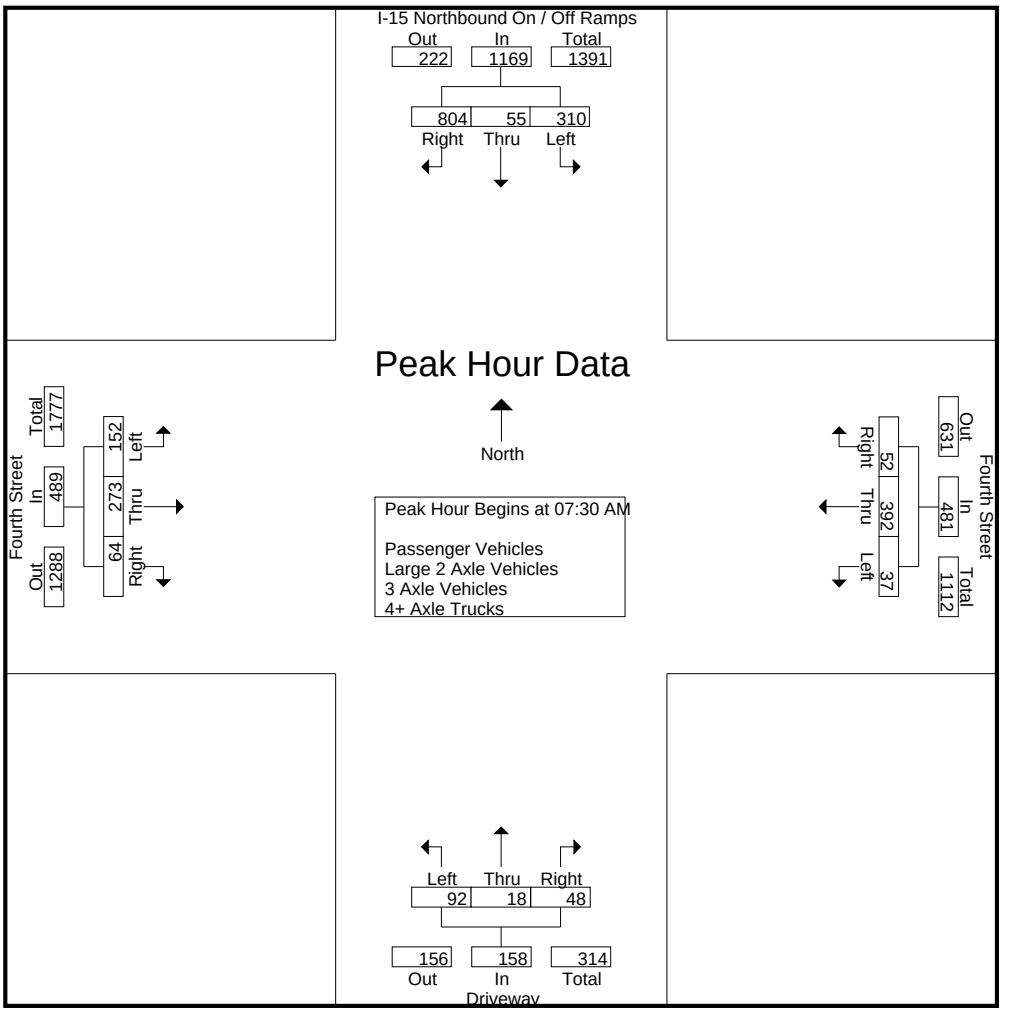
City of Rancho Cucamonga
N/S: I-15 Northbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15N4AM
Site Code : 09814452
Start Date : 11/20/2014
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:15 AM			
+0 mins.	62	**18**	193	273	9	109	13	**131**	**29**	3	13	**45**	**47**	75	8	130
+15 mins.	79	16	194	289	9	**112**	7	128	24	5	**16**	45	32	61	12	105
+30 mins.	**86**	9	202	297	**15**	87	**16**	118	23	**6**	9	38	41	**80**	**23**	**144**
+45 mins.	83	12	**215**	**310**	4	84	16	104	16	4	10	30	43	67	18	128
Total Volume	310	55	804	1169	37	392	52	481	92	18	48	158	163	283	61	507
% App. Total	26.5	4.7	68.8		7.7	81.5	10.8		58.2	11.4	30.4		32.1	55.8	12	
PHF	.901	.764	.935	.943	.617	.875	.813	.918	.793	.750	.750	.878	.867	.884	.663	.880

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City of Rancho Cucamonga
N/S: I-15 Northbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15N4AM
Site Code : 09814452
Start Date : 11/20/2014
Page No : 1

Groups Printed- Passenger Vehicles

	I-15 Northbound On / Off Ramps Southbound				Fourth Street Westbound				Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	56	17	122	195	11	66	10	87	13	9	9	31	34	58	15	107	420
07:15 AM	35	15	154	204	8	61	4	73	18	1	8	27	42	69	8	119	423
07:30 AM	53	18	181	252	9	96	10	115	27	3	12	42	32	55	12	99	508
07:45 AM	70	14	189	273	8	104	6	118	23	5	14	42	40	71	22	133	566
Total	214	64	646	924	36	327	30	393	81	18	43	142	148	253	57	458	1917
08:00 AM	79	7	193	279	14	74	12	100	21	5	8	34	41	56	18	115	528
08:15 AM	72	12	204	288	4	73	13	90	16	4	10	30	34	56	11	101	509
08:30 AM	40	11	169	220	11	63	9	83	23	6	10	39	36	50	15	101	443
08:45 AM	48	11	161	220	9	74	10	93	18	9	6	33	34	44	10	88	434
Total	239	41	727	1007	38	284	44	366	78	24	34	136	145	206	54	405	1914
Grand Total	453	105	1373	1931	74	611	74	759	159	42	77	278	293	459	111	863	3831
Apprch %	23.5	5.4	71.1		9.7	80.5	9.7		57.2	15.1	27.7		34	53.2	12.9		
Total %	11.8	2.7	35.8	50.4	1.9	15.9	1.9	19.8	4.2	1.1	2	7.3	7.6	12	2.9	22.5	

	I-15 Northbound On / Off Ramps Southbound				Fourth Street Westbound				Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	53	**18**	181	252	9	96	10	115	**27**	3	12	**42**	32	55	12	99	508
07:45 AM	70	14	189	273	8	**104**	6	**118**	23	**5**	**14**	42	40	**71**	**22**	**133**	**566**
08:00 AM	**79**	7	193	279	**14**	74	12	100	21	5	8	34	**41**	56	18	115	528
08:15 AM	72	12	**204**	**288**	4	73	**13**	90	16	4	10	30	34	56	11	101	509
Total Volume	274	51	767	1092	35	347	41	423	87	17	44	148	147	238	63	448	2111
% App. Total	25.1	4.7	70.2		8.3	82	9.7		58.8	11.5	29.7		32.8	53.1	14.1		
PHF	.867	.708	.940	.948	.625	.834	.788	.896	.806	.850	.786	.881	.896	.838	.716	.842	.932

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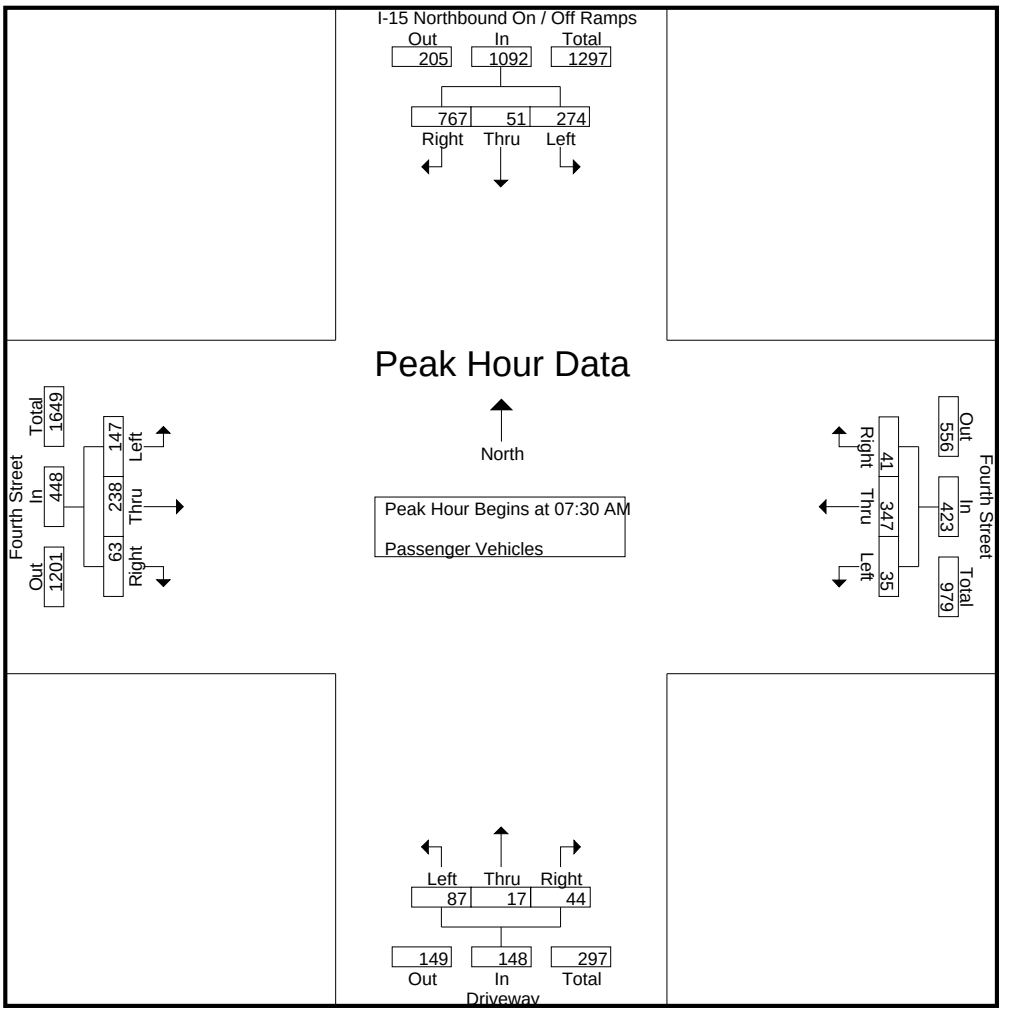
City of Rancho Cucamonga
N/S: I-15 Northbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15N4AM
Site Code : 09814452
Start Date : 11/20/2014
Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	53	**18**	181	252	9	96	10	115	**27**	3	12	**42**	32	55	12	99
+15 mins.	70	14	189	273	8	**104**	6	**118**	23	**5**	**14**	42	40	**71**	**22**	**133**
+30 mins.	**79**	7	193	279	**14**	74	12	100	21	5	8	34	**41**	56	18	115
+45 mins.	72	12	**204**	**288**	4	73	**13**	90	16	4	10	30	34	56	11	101
Total Volume	274	51	767	1092	35	347	41	423	87	17	44	148	147	238	63	448
% App. Total	25.1	4.7	70.2		8.3	82	9.7		58.8	11.5	29.7		32.8	53.1	14.1	
PHF	.867	.708	.940	.948	.625	.834	.788	.896	.806	.850	.786	.881	.896	.838	.716	.842

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City of Rancho Cucamonga
N/S: I-15 Northbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15N4AM
Site Code : 09814452
Start Date : 11/20/2014
Page No : 1

Groups Printed- Large 2 Axle Vehicles

	I-15 Northbound On / Off Ramps Southbound				Fourth Street Westbound				Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	2	0	1	3	2	4	0	6	0	1	1	2	3	1	0	4	15
07:15 AM	1	0	2	3	0	4	3	7	0	0	0	0	3	3	0	6	16
07:30 AM	4	0	1	5	0	4	1	5	0	0	0	0	0	3	0	3	13
07:45 AM	0	0	2	2	0	3	1	4	0	0	0	0	1	0	0	1	7
Total	7	0	6	13	2	15	5	22	0	1	1	2	7	7	0	14	51
08:00 AM	1	1	2	4	1	4	1	6	1	0	0	1	1	3	0	4	15
08:15 AM	2	0	4	6	0	5	1	6	0	0	0	0	2	6	0	8	20
08:30 AM	3	0	4	7	0	3	2	5	0	0	0	0	2	2	1	5	17
08:45 AM	5	0	8	13	2	7	0	9	1	1	0	2	1	3	0	4	28
Total	11	1	18	30	3	19	4	26	2	1	0	3	6	14	1	21	80
Grand Total	18	1	24	43	5	34	9	48	2	2	1	5	13	21	1	35	131
Apprch %	41.9	2.3	55.8		10.4	70.8	18.8		40	40	20		37.1	60	2.9		
Total %	13.7	0.8	18.3	32.8	3.8	26	6.9	36.6	1.5	1.5	0.8	3.8	9.9	16	0.8	26.7	

	I-15 Northbound On / Off Ramps Southbound				Fourth Street Westbound				Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**4**	0	1	5	0	4	**1**	5	0	0	0	0	0	3	0	3	13
07:45 AM	0	0	2	2	0	3	1	4	0	0	0	0	1	0	0	1	7
08:00 AM	1	**1**	2	4	**1**	4	1	**6**	**1**	0	0	**1**	1	3	0	4	15
08:15 AM	2	0	**4**	**6**	0	**5**	1	6	0	0	0	0	**2**	**6**	0	**8**	**20**
Total Volume	7	1	9	17	1	16	4	21	1	0	0	1	4	12	0	16	55
% App. Total	41.2	5.9	52.9		4.8	76.2	19		100	0	0		25	75	0		
PHF	.438	.250	.563	.708	.250	.800	1.00	.875	.250	.000	.000	.250	.500	.500	.000	.500	.688

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City of Rancho Cucamonga
N/S: I-15 Northbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15N4AM
Site Code : 09814452
Start Date : 11/20/2014
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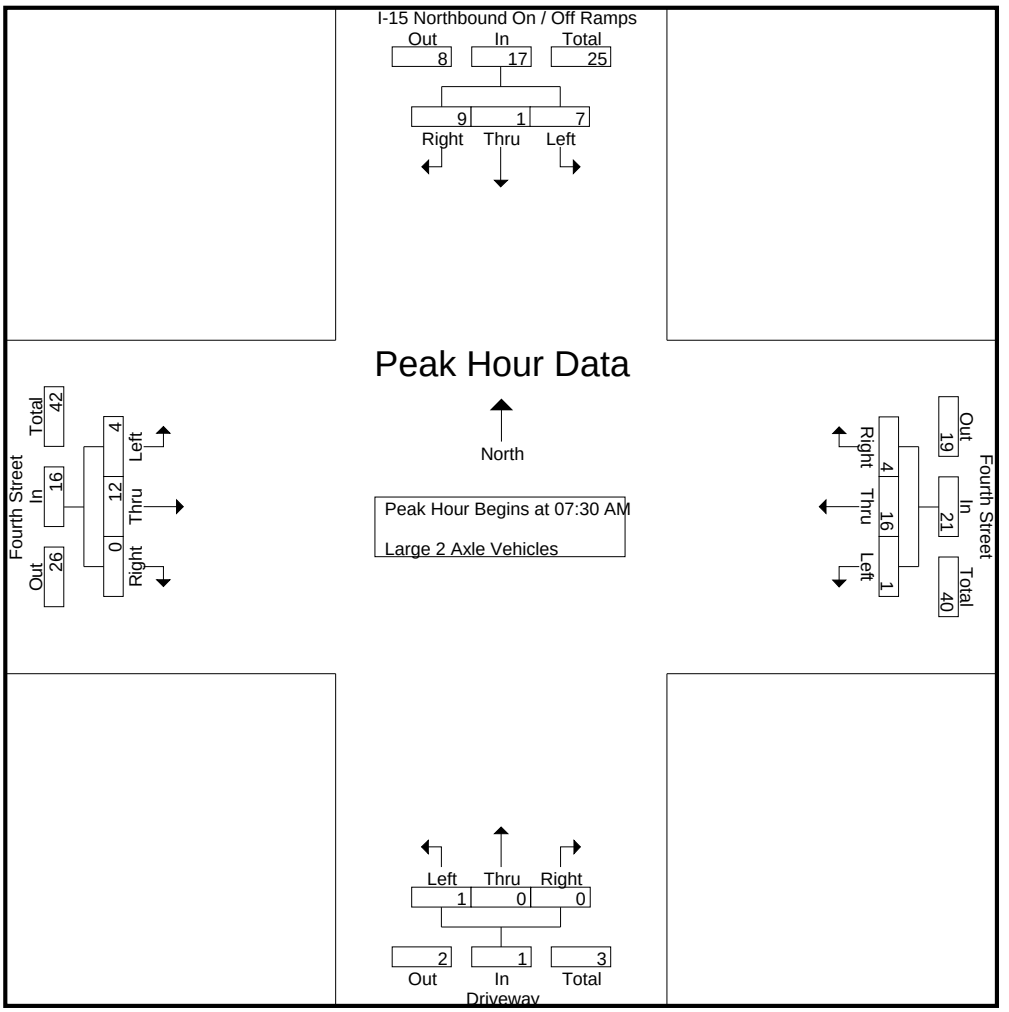

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	**4**	0	1	5	0	4	**1**	5	0	0	0	0	0	3	0	3
+15 mins.	0	0	2	2	0	3	1	4	0	0	0	0	1	0	0	1
+30 mins.	1	**1**	2	4	**1**	4	1	**6**	**1**	0	0	**1**	1	3	0	4
+45 mins.	2	0	**4**	**6**	0	**5**	1	6	0	0	0	0	**2**	**6**	0	**8**
Total Volume	7	1	9	17	1	16	4	21	1	0	0	1	4	12	0	16
% App. Total	41.2	5.9	52.9		4.8	76.2	19		100	0	0		25	75	0	
PHF	.438	.250	.563	.708	.250	.800	1.000	.875	.250	.000	.000	.250	.500	.500	.000	.500

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City of Rancho Cucamonga
N/S: I-15 Northbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15N4AM
Site Code : 09814452
Start Date : 11/20/2014
Page No : 1

Groups Printed- 3 Axle Vehicles

	I-15 Northbound On / Off Ramps Southbound				Fourth Street Westbound				Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	1	1	0	1	0	1	1	0	0	1	0	0	0	0	3
07:45 AM	0	1	0	1	0	1	0	1	0	0	1	1	0	1	1	2	5
Total	0	1	1	2	0	3	0	3	1	0	1	2	0	2	1	3	10
08:00 AM	1	0	2	3	0	4	0	4	0	1	0	1	0	0	0	0	8
08:15 AM	1	0	0	1	0	1	0	1	0	0	0	0	0	1	0	1	3
08:30 AM	2	0	0	2	0	3	0	3	0	0	0	0	0	0	0	0	5
08:45 AM	1	0	0	1	1	4	0	5	0	0	0	0	0	3	0	3	9
Total	5	0	2	7	1	12	0	13	0	1	0	1	0	4	0	4	25
Grand Total	5	1	3	9	1	15	0	16	1	1	1	3	0	6	1	7	35
Apprch %	55.6	11.1	33.3		6.2	93.8	0		33.3	33.3	33.3		0	85.7	14.3		
Total %	14.3	2.9	8.6	25.7	2.9	42.9	0	45.7	2.9	2.9	2.9	8.6	0	17.1	2.9	20	

	I-15 Northbound On / Off Ramps Southbound				Fourth Street Westbound				Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	1	1	0	1	0	1	**1**	0	0	**1**	0	0	0	0	3
07:45 AM	0	**1**	0	1	0	1	0	1	0	0	**1**	1	0	**1**	**1**	**2**	5
08:00 AM	**1**	0	**2**	**3**	0	**4**	0	**4**	0	**1**	0	1	0	0	0	0	**8**
08:15 AM	1	0	0	1	0	1	0	1	0	0	0	0	0	1	0	1	3
Total Volume	2	1	3	6	0	7	0	7	1	1	1	3	0	2	1	3	19
% App. Total	33.3	16.7	50		0	100	0		33.3	33.3	33.3		0	66.7	33.3		
PHF	.500	.250	.375	.500	.000	.438	.000	.438	.250	.250	.250	.750	.000	.500	.250	.375	.594

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City of Rancho Cucamonga
N/S: I-15 Northbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15N4AM
Site Code : 09814452
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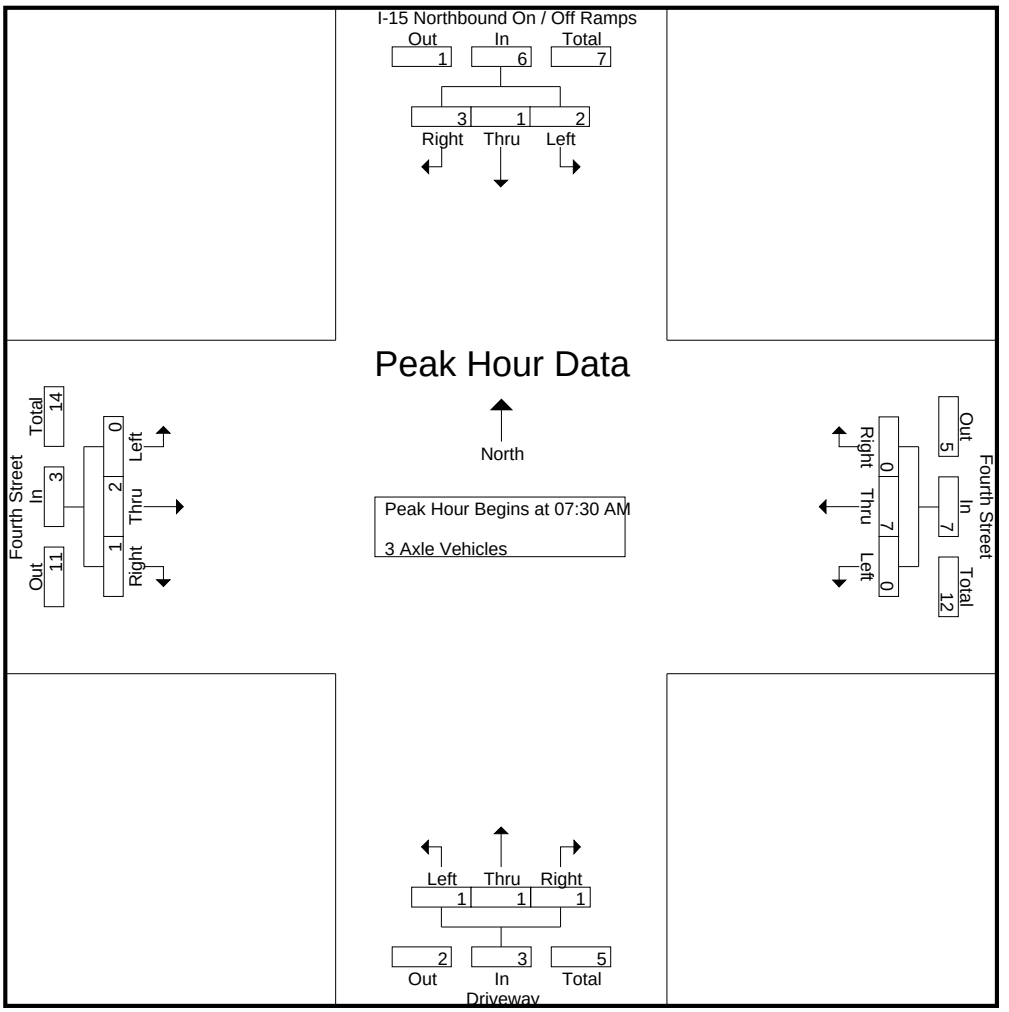

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	0	1	1	0	1	0	1	**1**	0	0	**1**	0	0	0	0
+15 mins.	0	**1**	0	1	0	1	0	1	0	0	**1**	1	0	**1**	**1**	**2**
+30 mins.	**1**	0	**2**	**3**	0	**4**	0	**4**	0	**1**	0	1	0	0	0	0
+45 mins.	1	0	0	1	0	1	0	1	0	0	0	0	0	1	0	1
Total Volume	2	1	3	6	0	7	0	7	1	1	1	3	0	2	1	3
% App. Total	33.3	16.7	50		0	100	0		33.3	33.3	33.3		0	66.7	33.3	
PHF	.500	.250	.375	.500	.000	.438	.000	.438	.250	.250	.250	.750	.000	.500	.250	.375

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City of Rancho Cucamonga
N/S: I-15 Northbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

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Groups Printed- 4+ Axle Trucks

	I-15 Northbound On / Off Ramps Southbound				Fourth Street Westbound				Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	5	2	6	13	0	4	0	4	0	0	0	0	4	7	0	11	28
07:15 AM	0	1	2	3	0	5	2	7	0	0	0	0	2	3	0	5	15
07:30 AM	5	0	10	15	0	8	2	10	1	0	1	2	0	3	0	3	30
07:45 AM	9	1	3	13	1	4	0	5	1	0	1	2	0	8	0	8	28
Total	19	4	21	44	1	21	4	26	2	0	2	4	6	21	0	27	101
08:00 AM	5	1	5	11	0	5	3	8	1	0	1	2	1	8	0	9	30
08:15 AM	8	0	7	15	0	5	2	7	0	0	0	0	0	2	0	2	24
08:30 AM	8	0	9	17	0	10	2	12	0	0	0	0	1	8	0	9	38
08:45 AM	13	0	15	28	0	8	4	12	0	0	0	0	0	6	1	7	47
Total	34	1	36	71	0	28	11	39	1	0	1	2	2	24	1	27	139
Grand Total	53	5	57	115	1	49	15	65	3	0	3	6	8	45	1	54	240
Apprch %	46.1	4.3	49.6		1.5	75.4	23.1		50	0	50		14.8	83.3	1.9		
Total %	22.1	2.1	23.8	47.9	0.4	20.4	6.2	27.1	1.2	0	1.2	2.5	3.3	18.8	0.4	22.5	

	I-15 Northbound On / Off Ramps Southbound				Fourth Street Westbound				Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	5	0	**10**	**15**	0	**8**	2	**10**	**1**	0	**1**	**2**	0	3	0	3	**30**
07:45 AM	**9**	**1**	3	13	**1**	4	0	5	1	0	1	2	0	**8**	0	8	28
08:00 AM	5	1	5	11	0	5	**3**	8	1	0	1	2	**1**	8	0	**9**	30
08:15 AM	8	0	7	15	0	5	2	7	0	0	0	0	0	2	0	2	24
Total Volume	27	2	25	54	1	22	7	30	3	0	3	6	1	21	0	22	112
% App. Total	50	3.7	46.3		3.3	73.3	23.3		50	0	50		4.5	95.5	0		
PHF	.750	.500	.625	.900	.250	.688	.583	.750	.750	.000	.750	.750	.250	.656	.000	.611	.933

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City of Rancho Cucamonga
N/S: I-15 Northbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15N4AM
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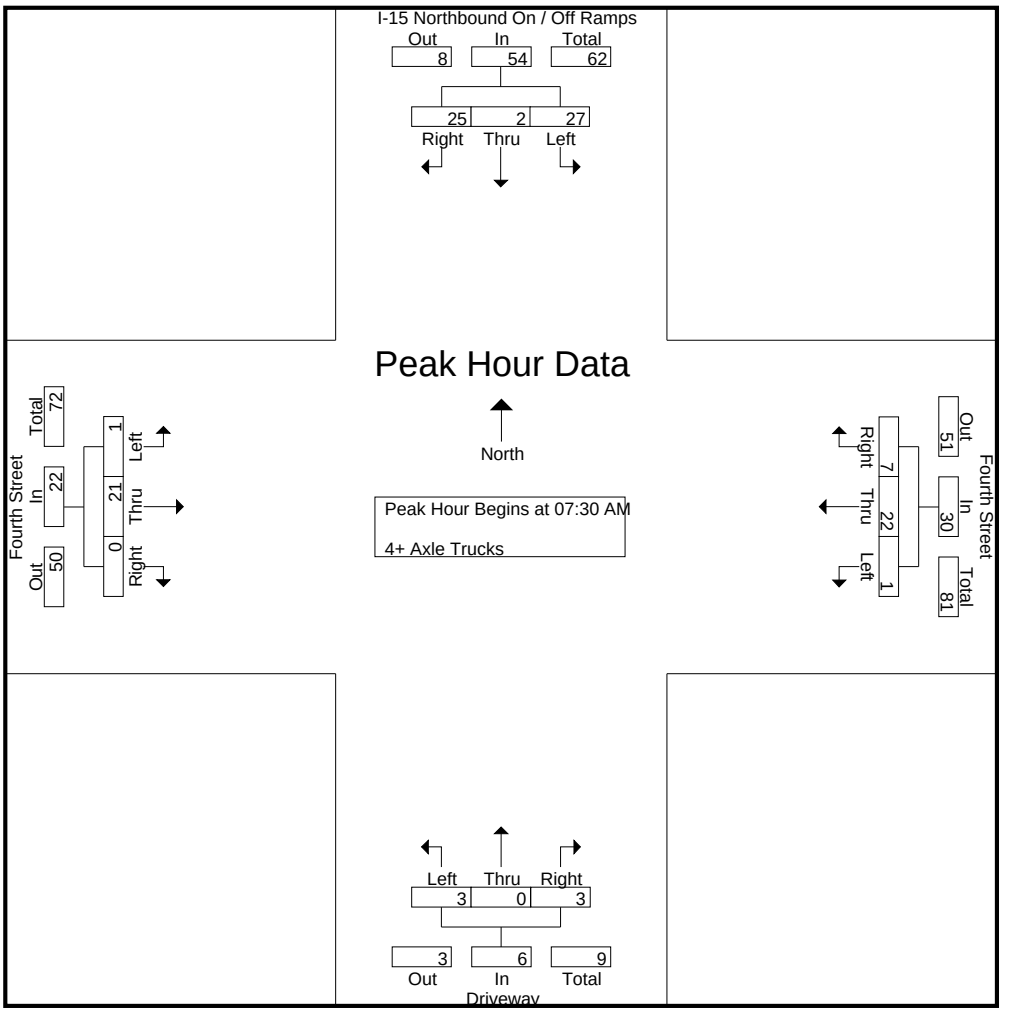

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	5	0	**10**	**15**	0	**8**	2	**10**	**1**	0	**1**	**2**	0	3	0	3
+15 mins.	**9**	**1**	3	13	**1**	4	0	5	1	0	1	2	0	**8**	0	8
+30 mins.	5	1	5	11	0	5	**3**	8	1	0	1	2	**1**	8	0	**9**
+45 mins.	8	0	7	15	0	5	2	7	0	0	0	0	0	2	0	2
Total Volume	27	2	25	54	1	22	7	30	3	0	3	6	1	21	0	22
% App. Total	50	3.7	46.3		3.3	73.3	23.3		50	0	50		4.5	95.5	0	
PHF	.750	.500	.625	.900	.250	.688	.583	.750	.750	.000	.750	.750	.250	.656	.000	.611

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City of Rancho Cucamonga
N/S: I-15 Northbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15N4PM
Site Code : 09814452
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Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	I-15 Northbound On / Off Ramps Southbound				Fourth Street Westbound				Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	27	11	139	177	17	165	55	237	21	16	10	47	157	113	16	286	747
04:15 PM	27	12	131	170	20	149	36	205	21	18	11	50	169	138	29	336	761
04:30 PM	31	14	139	184	18	143	36	197	28	14	9	51	174	142	20	336	768
04:45 PM	34	8	126	168	18	167	42	227	20	12	12	44	174	116	14	304	743
Total	119	45	535	699	73	624	169	866	90	60	42	192	674	509	79	1262	3019
05:00 PM	34	14	143	191	18	146	43	207	26	19	10	55	175	137	23	335	788
05:15 PM	21	21	115	157	12	168	22	202	25	19	18	62	173	195	24	392	813
05:30 PM	26	11	131	168	14	159	40	213	18	16	15	49	154	132	19	305	735
05:45 PM	29	10	135	174	14	143	24	181	17	15	15	47	147	140	16	303	705
Total	110	56	524	690	58	616	129	803	86	69	58	213	649	604	82	1335	3041
Grand Total	229	101	1059	1389	131	1240	298	1669	176	129	100	405	1323	1113	161	2597	6060
Apprch %	16.5	7.3	76.2		7.8	74.3	17.9		43.5	31.9	24.7		50.9	42.9	6.2		
Total %	3.8	1.7	17.5	22.9	2.2	20.5	4.9	27.5	2.9	2.1	1.7	6.7	21.8	18.4	2.7	42.9	
Passenger Vehicles	200	96	1020	1316	129	1178	280	1587	170	129	99	398	1310	1049	158	2517	5818
% Passenger Vehicles	87.3	95	96.3	94.7	98.5	95	94	95.1	96.6	100	99	98.3	99	94.2	98.1	96.9	96
Large 2 Axle Vehicles	8	1	8	17	2	21	2	25	3	0	1	4	2	21	2	25	71
% Large 2 Axle Vehicles	3.5	1	0.8	1.2	1.5	1.7	0.7	1.5	1.7	0	1	1	0.2	1.9	1.2	1	1.2
3 Axle Vehicles	5	4	4	13	0	12	4	16	1	0	0	1	1	8	1	10	40
% 3 Axle Vehicles	2.2	4	0.4	0.9	0	1	1.3	1	0.6	0	0	0.2	0.1	0.7	0.6	0.4	0.7
4+ Axle Trucks	16	0	27	43	0	29	12	41	2	0	0	2	10	35	0	45	131
% 4+ Axle Trucks	7	0	2.5	3.1	0	2.3	4	2.5	1.1	0	0	0.5	0.8	3.1	0	1.7	2.2

	I-15 Northbound On / Off Ramps Southbound				Fourth Street Westbound				Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	31	14	139	184	**18**	143	36	197	**28**	14	9	51	174	142	20	336	768
04:45 PM	**34**	8	126	168	18	167	42	**227**	20	12	12	44	174	116	14	304	743
05:00 PM	34	14	**143**	**191**	18	146	**43**	207	26	**19**	10	55	**175**	137	23	335	788
05:15 PM	21	**21**	115	157	12	**168**	22	202	25	19	**18**	**62**	173	**195**	**24**	**392**	**813**
Total Volume	120	57	523	700	66	624	143	833	99	64	49	212	696	590	81	1367	3112
% App. Total	17.1	8.1	74.7		7.9	74.9	17.2		46.7	30.2	23.1		50.9	43.2	5.9		
PHF	.882	.679	.914	.916	.917	.929	.831	.917	.884	.842	.681	.855	.994	.756	.844	.872	.957

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City of Rancho Cucamonga
N/S: I-15 Northbound On / Off Ramps
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Weather: Clear

File Name : RNC15N4PM
Site Code : 09814452
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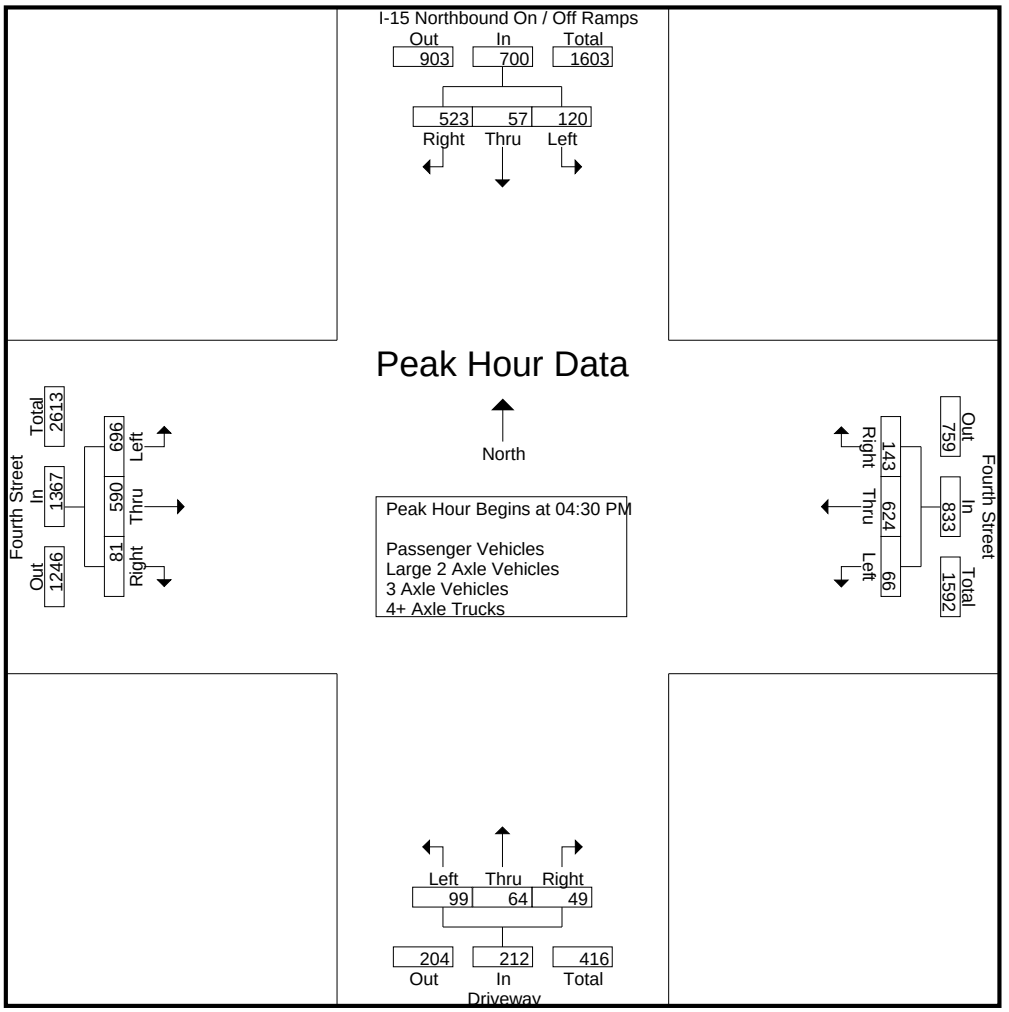

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:00 PM				05:00 PM				04:30 PM			
+0 mins.	27	12	131	170	17	165	**55**	**237**	**26**	**19**	10	55	174	142	20	336
+15 mins.	31	**14**	139	184	**20**	149	36	205	25	19	**18**	**62**	174	116	14	304
+30 mins.	**34**	8	126	168	18	143	36	197	18	16	15	49	**175**	137	23	335
+45 mins.	34	14	**143**	**191**	18	**167**	42	227	17	15	15	47	173	**195**	**24**	**392**
Total Volume	126	48	539	713	73	624	169	866	86	69	58	213	696	590	81	1367
% App. Total	17.7	6.7	75.6		8.4	72.1	19.5		40.4	32.4	27.2		50.9	43.2	5.9	
PHF	.926	.857	.942	.933	.913	.934	.768	.914	.827	.908	.806	.859	.994	.756	.844	.872

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Groups Printed- Passenger Vehicles

	I-15 Northbound On / Off Ramps Southbound				Fourth Street Westbound				Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	23	11	129	163	16	162	50	228	21	16	10	47	156	106	16	278	716
04:15 PM	21	12	125	158	19	138	32	189	20	18	11	49	165	128	29	322	718
04:30 PM	29	11	134	174	18	136	36	190	25	14	9	48	174	134	19	327	739
04:45 PM	33	8	120	161	18	156	41	215	20	12	12	44	171	110	13	294	714
Total	106	42	508	656	71	592	159	822	86	60	42	188	666	478	77	1221	2887
05:00 PM	29	14	140	183	18	140	42	200	24	19	9	52	173	132	22	327	762
05:15 PM	19	21	113	153	12	162	20	194	25	19	18	62	172	184	24	380	789
05:30 PM	21	9	127	157	14	147	39	200	18	16	15	49	153	126	19	298	704
05:45 PM	25	10	132	167	14	137	20	171	17	15	15	47	146	129	16	291	676
Total	94	54	512	660	58	586	121	765	84	69	57	210	644	571	81	1296	2931
Grand Total	200	96	1020	1316	129	1178	280	1587	170	129	99	398	1310	1049	158	2517	5818
Apprch %	15.2	7.3	77.5		8.1	74.2	17.6		42.7	32.4	24.9		52	41.7	6.3		
Total %	3.4	1.7	17.5	22.6	2.2	20.2	4.8	27.3	2.9	2.2	1.7	6.8	22.5	18	2.7	43.3	

	I-15 Northbound On / Off Ramps Southbound				Fourth Street Westbound				Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	29	11	134	174	**18**	136	36	190	**25**	14	9	48	**174**	134	19	327	739
04:45 PM	**33**	8	120	161	18	156	41	**215**	20	12	12	44	171	110	13	294	714
05:00 PM	29	14	**140**	**183**	18	140	**42**	200	24	**19**	9	52	173	132	22	327	762
05:15 PM	19	**21**	113	153	12	**162**	20	194	25	19	**18**	**62**	172	**184**	**24**	**380**	**789**
Total Volume	110	54	507	671	66	594	139	799	94	64	48	206	690	560	78	1328	3004
% App. Total	16.4	8	75.6		8.3	74.3	17.4		45.6	31.1	23.3		52	42.2	5.9		
PHF	.833	.643	.905	.917	.917	.917	.827	.929	.940	.842	.667	.831	.991	.761	.813	.874	.952

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City of Rancho Cucamonga
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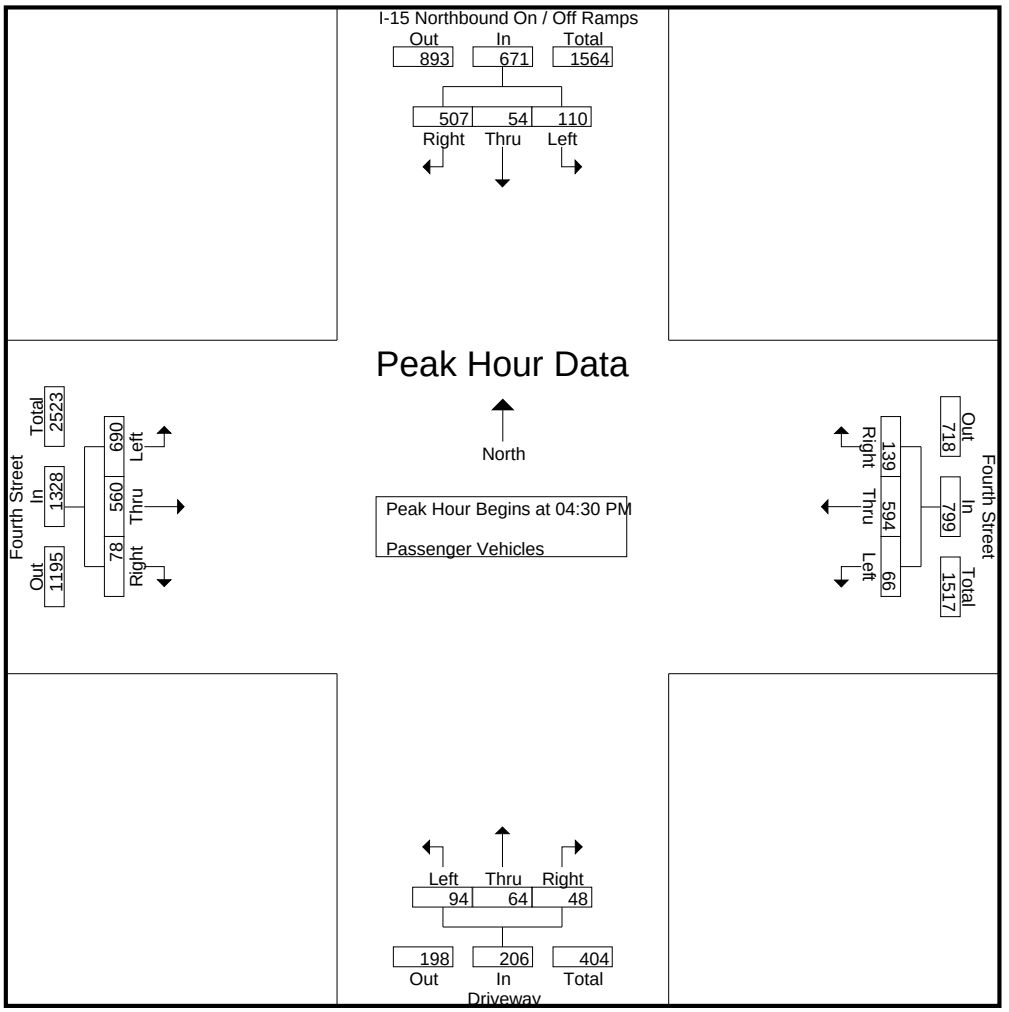

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	29	11	134	174	**18**	136	36	190	**25**	14	9	48	**174**	134	19	327
+15 mins.	**33**	8	120	161	18	156	41	**215**	20	12	12	44	171	110	13	294
+30 mins.	29	14	**140**	**183**	18	140	**42**	200	24	**19**	9	52	173	132	22	327
+45 mins.	19	**21**	113	153	12	**162**	20	194	25	19	**18**	**62**	172	**184**	**24**	**380**
Total Volume	110	54	507	671	66	594	139	799	94	64	48	206	690	560	78	1328
% App. Total	16.4	8	75.6		8.3	74.3	17.4		45.6	31.1	23.3		52	42.2	5.9	
PHF	.833	.643	.905	.917	.917	.917	.827	.929	.940	.842	.667	.831	.991	.761	.813	.874

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City of Rancho Cucamonga
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E/W: Fourth Street
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File Name : RNC15N4PM
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Groups Printed- Large 2 Axle Vehicles

	I-15 Northbound On / Off Ramps Southbound				Fourth Street Westbound				Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	3	3	1	0	1	2	0	0	0	0	0	2	0	2	7
04:15 PM	3	0	2	5	1	2	1	4	1	0	0	1	1	5	0	6	16
04:30 PM	1	1	0	2	0	5	0	5	2	0	0	2	0	4	1	5	14
04:45 PM	1	0	1	2	0	5	0	5	0	0	0	0	1	0	0	1	8
Total	5	1	6	12	2	12	2	16	3	0	0	3	2	11	1	14	45
05:00 PM	0	0	1	1	0	1	0	1	0	0	1	1	0	2	1	3	6
05:15 PM	0	0	0	0	0	5	0	5	0	0	0	0	0	5	0	5	10
05:30 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	1	2
05:45 PM	3	0	0	3	0	3	0	3	0	0	0	0	0	2	0	2	8
Total	3	0	2	5	0	9	0	9	0	0	1	1	0	10	1	11	26
Grand Total	8	1	8	17	2	21	2	25	3	0	1	4	2	21	2	25	71
Apprch %	47.1	5.9	47.1		8	84	8		75	0	25		8	84	8		
Total %	11.3	1.4	11.3	23.9	2.8	29.6	2.8	35.2	4.2	0	1.4	5.6	2.8	29.6	2.8	35.2	

	I-15 Northbound On / Off Ramps Southbound				Fourth Street Westbound				Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**1**	**1**	0	**2**	0	**5**	0	**5**	**2**	0	0	**2**	0	4	**1**	**5**	**14**
04:45 PM	1	0	**1**	2	0	5	0	5	0	0	0	0	**1**	0	0	1	8
05:00 PM	0	0	1	1	0	1	0	1	0	0	**1**	1	0	2	1	3	6
05:15 PM	0	0	0	0	0	5	0	5	0	0	0	0	0	**5**	0	5	10
Total Volume	2	1	2	5	0	16	0	16	2	0	1	3	1	11	2	14	38
% App. Total	40	20	40		0	100	0		66.7	0	33.3		7.1	78.6	14.3		
PHF	.500	.250	.500	.625	.000	.800	.000	.800	.250	.000	.250	.375	.250	.550	.500	.700	.679

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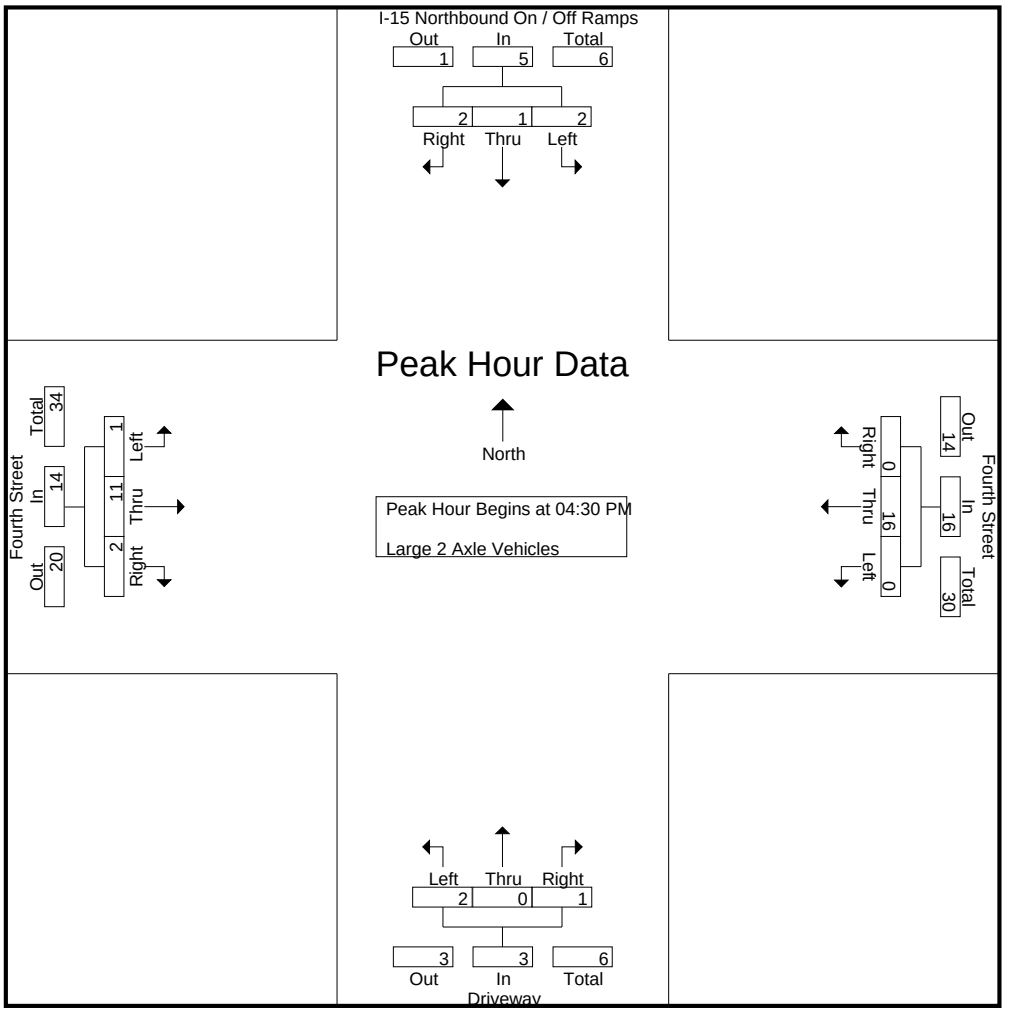

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	**1**	**1**	0	**2**	0	**5**	0	**5**	**2**	0	0	**2**	0	4	**1**	**5**
+15 mins.	1	0	**1**	2	0	5	0	5	0	0	0	0	**1**	0	0	1
+30 mins.	0	0	1	1	0	1	0	1	0	0	**1**	1	0	2	1	3
+45 mins.	0	0	0	0	0	5	0	5	0	0	0	0	0	**5**	0	5
Total Volume	2	1	2	5	0	16	0	16	2	0	1	3	1	11	2	14
% App. Total	40	20	40		0	100	0		66.7	0	33.3		7.1	78.6	14.3	
PHF	.500	.250	.500	.625	.000	.800	.000	.800	.250	.000	.250	.375	.250	.550	.500	.700

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Groups Printed- 3 Axle Vehicles

	I-15 Northbound On / Off Ramps Southbound				Fourth Street Westbound				Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
04:15 PM	1	0	0	1	0	2	0	2	0	0	0	0	0	1	0	1	4
04:30 PM	0	2	0	2	0	0	0	0	0	0	0	0	0	1	0	1	3
04:45 PM	0	0	1	1	0	1	0	1	0	0	0	0	1	0	1	2	4
Total	1	2	1	4	0	3	0	3	0	0	0	0	1	4	1	6	13
05:00 PM	1	0	0	1	0	2	1	3	1	0	0	1	0	0	0	0	5
05:15 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	2	0	2	3
05:30 PM	2	2	2	6	0	6	0	6	0	0	0	0	0	1	0	1	13
05:45 PM	1	0	1	2	0	1	2	3	0	0	0	0	0	1	0	1	6
Total	4	2	3	9	0	9	4	13	1	0	0	1	0	4	0	4	27
Grand Total	5	4	4	13	0	12	4	16	1	0	0	1	1	8	1	10	40
Apprch %	38.5	30.8	30.8		0	75	25		100	0	0		10	80	10		
Total %	12.5	10	10	32.5	0	30	10	40	2.5	0	0	2.5	2.5	20	2.5	25	

	I-15 Northbound On / Off Ramps Southbound				Fourth Street Westbound				Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	**2**	0	**2**	0	0	0	0	0	0	0	0	0	1	0	1	3
04:45 PM	0	0	**1**	1	0	1	0	1	0	0	0	0	**1**	0	**1**	**2**	4
05:00 PM	**1**	0	0	1	0	**2**	**1**	**3**	**1**	0	0	**1**	0	0	0	0	**5**
05:15 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	**2**	0	2	3
Total Volume	1	2	1	4	0	3	2	5	1	0	0	1	1	3	1	5	15
% App. Total	25	50	25		0	60	40		100	0	0		20	60	20		
PHF	.250	.250	.250	.500	.000	.375	.500	.417	.250	.000	.000	.250	.250	.375	.250	.625	.750

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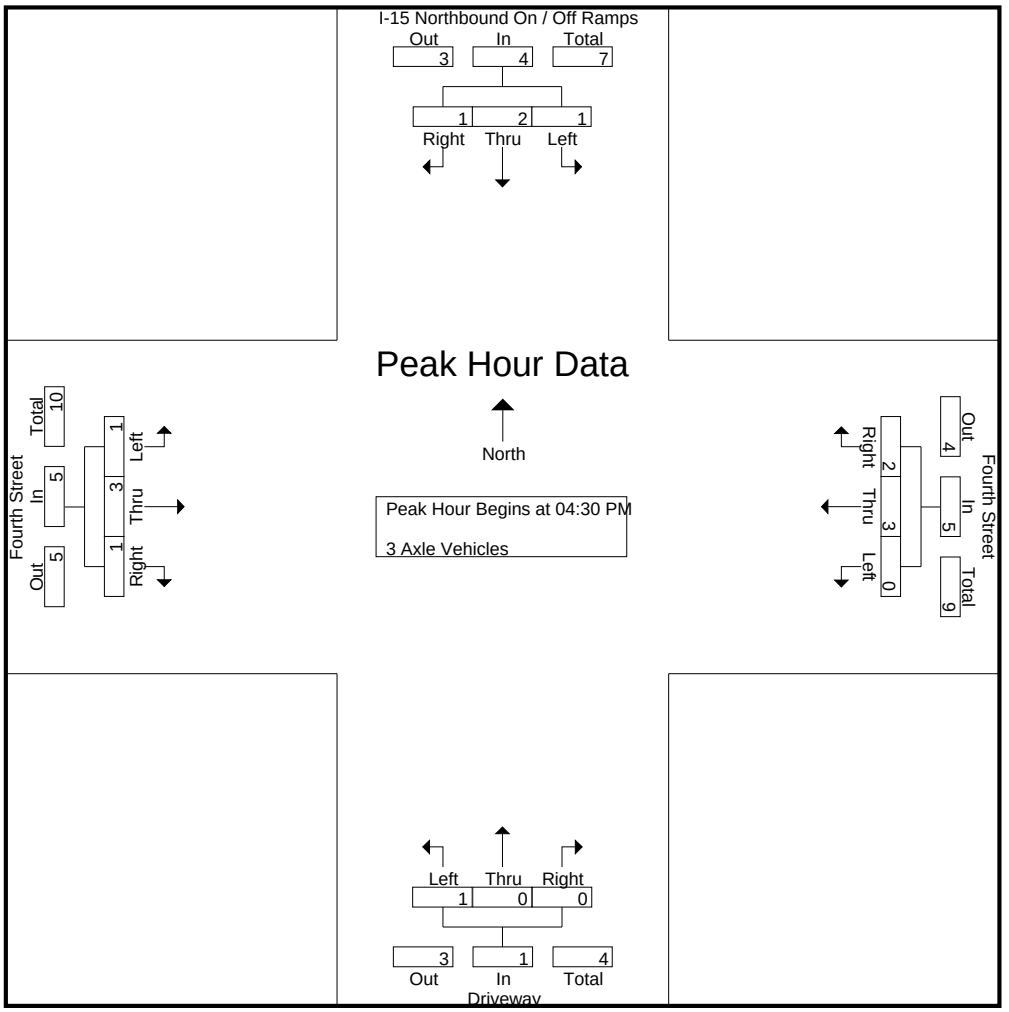

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	0	**2**	0	**2**	0	0	0	0	0	0	0	0	0	1	0	1
+15 mins.	0	0	**1**	1	0	1	0	1	0	0	0	0	**1**	0	**1**	**2**
+30 mins.	**1**	0	0	1	0	**2**	**1**	**3**	**1**	0	0	**1**	0	0	0	0
+45 mins.	0	0	0	0	0	0	1	1	0	0	0	0	0	**2**	0	2
Total Volume	1	2	1	4	0	3	2	5	1	0	0	1	1	3	1	5
% App. Total	25	50	25		0	60	40		100	0	0		20	60	20	
PHF	.250	.250	.250	.500	.000	.375	.500	.417	.250	.000	.000	.250	.250	.375	.250	.625

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City of Rancho Cucamonga
N/S: I-15 Northbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15N4PM
Site Code : 09814452
Start Date : 11/20/2014
Page No : 1

Groups Printed- 4+ Axle Trucks

	I-15 Northbound On / Off Ramps Southbound				Fourth Street Westbound				Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	4	0	7	11	0	3	4	7	0	0	0	0	1	3	0	4	22
04:15 PM	2	0	4	6	0	7	3	10	0	0	0	0	3	4	0	7	23
04:30 PM	1	0	5	6	0	2	0	2	1	0	0	1	0	3	0	3	12
04:45 PM	0	0	4	4	0	5	1	6	0	0	0	0	1	6	0	7	17
Total	7	0	20	27	0	17	8	25	1	0	0	1	5	16	0	21	74
05:00 PM	4	0	2	6	0	3	0	3	1	0	0	1	2	3	0	5	15
05:15 PM	2	0	2	4	0	1	1	2	0	0	0	0	1	4	0	5	11
05:30 PM	3	0	1	4	0	6	1	7	0	0	0	0	1	4	0	5	16
05:45 PM	0	0	2	2	0	2	2	4	0	0	0	0	1	8	0	9	15
Total	9	0	7	16	0	12	4	16	1	0	0	1	5	19	0	24	57
Grand Total	16	0	27	43	0	29	12	41	2	0	0	2	10	35	0	45	131
Apprch %	37.2	0	62.8		0	70.7	29.3		100	0	0		22.2	77.8	0		
Total %	12.2	0	20.6	32.8	0	22.1	9.2	31.3	1.5	0	0	1.5	7.6	26.7	0	34.4	

	I-15 Northbound On / Off Ramps Southbound				Fourth Street Westbound				Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	1	0	**5**	**6**	0	2	0	2	**1**	0	0	**1**	0	3	0	3	12
04:45 PM	0	0	4	4	0	**5**	**1**	**6**	0	0	0	0	1	**6**	0	**7**	**17**
05:00 PM	**4**	0	2	6	0	3	0	3	1	0	0	1	**2**	3	0	5	15
05:15 PM	2	0	2	4	0	1	1	2	0	0	0	0	1	4	0	5	11
Total Volume	7	0	13	20	0	11	2	13	2	0	0	2	4	16	0	20	55
% App. Total	35	0	65		0	84.6	15.4		100	0	0		20	80	0		
PHF	.438	.000	.650	.833	.000	.550	.500	.542	.500	.000	.000	.500	.500	.667	.000	.714	.809

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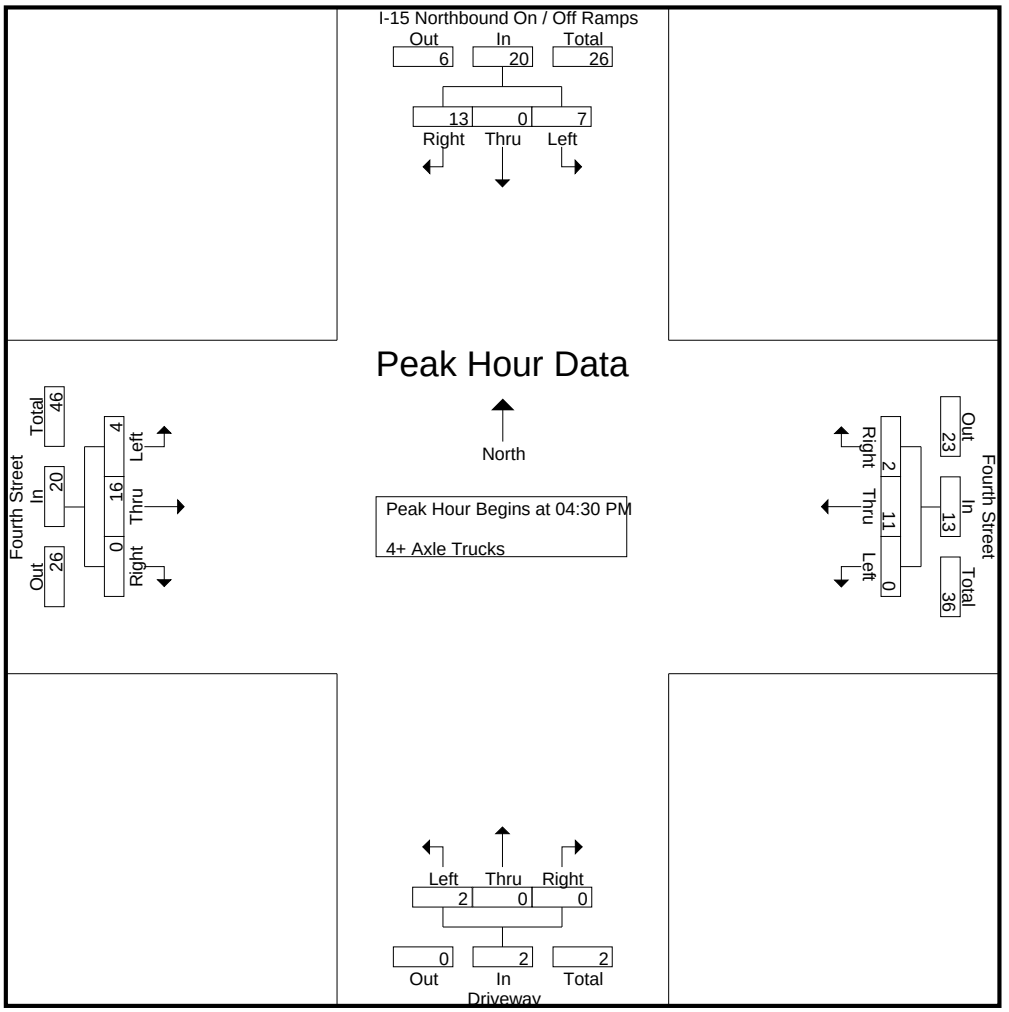
City of Rancho Cucamonga
N/S: I-15 Northbound On / Off Ramps
E/W: Fourth Street
Weather: Clear

File Name : RNC15N4PM
Site Code : 09814452
Start Date : 11/20/2014
Page No : 2



Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	1	0	**5**	**6**	0	2	0	2	**1**	0	0	**1**	0	3	0	3
+15 mins.	0	0	4	4	0	**5**	**1**	**6**	0	0	0	0	1	**6**	0	**7**
+30 mins.	**4**	0	2	6	0	3	0	3	1	0	0	1	**2**	3	0	5
+45 mins.	2	0	2	4	0	1	1	2	0	0	0	0	1	4	0	5
Total Volume	7	0	13	20	0	11	2	13	2	0	0	2	4	16	0	20
% App. Total	35	0	65		0	84.6	15.4		100	0	0		20	80	0	
PHF	.438	.000	.650	.833	.000	.550	.500	.542	.500	.000	.000	.500	.500	.667	.000	.714

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City of Rancho Cucamonga
N/S: Haven Avenue
E/W: Concours Street
Weather: Clear

File Name : 04_RNC_Haven_Concours AM
Site Code : 99919439
Start Date : 5/23/2019
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	19	312	6	337	38	7	0	45	12	350	24	386	2	5	19	26	794
07:15 AM	16	337	9	362	50	11	4	65	16	329	22	367	4	2	17	23	817
07:30 AM	13	315	10	338	35	16	3	54	11	381	32	424	4	10	23	37	853
07:45 AM	35	331	17	383	39	19	2	60	16	466	41	523	7	13	19	39	1005
Total	83	1295	42	1420	162	53	9	224	55	1526	119	1700	17	30	78	125	3469
08:00 AM	25	288	4	317	27	9	7	43	22	494	31	547	4	16	16	36	943
08:15 AM	19	278	5	302	18	14	4	36	16	399	35	450	1	6	16	23	811
08:30 AM	17	262	5	284	31	9	3	43	12	385	22	419	3	10	21	34	780
08:45 AM	22	238	9	269	15	5	3	23	21	421	20	462	4	3	15	22	776
Total	83	1066	23	1172	91	37	17	145	71	1699	108	1878	12	35	68	115	3310
Grand Total	166	2361	65	2592	253	90	26	369	126	3225	227	3578	29	65	146	240	6779
Apprch %	6.4	91.1	2.5		68.6	24.4	7		3.5	90.1	6.3		12.1	27.1	60.8		
Total %	2.4	34.8	1	38.2	3.7	1.3	0.4	5.4	1.9	47.6	3.3	52.8	0.4	1	2.2	3.5	
Passenger Vehicles	163	2201	64	2428	248	89	26	363	123	3076	223	3422	29	64	144	237	6450
% Passenger Vehicles	98.2	93.2	98.5	93.7	98	98.9	100	98.4	97.6	95.4	98.2	95.6	100	98.5	98.6	98.8	95.1
Large 2 Axle Vehicles	2	67	0	69	4	1	0	5	2	79	4	85	0	0	1	1	160
% Large 2 Axle Vehicles	1.2	2.8	0	2.7	1.6	1.1	0	1.4	1.6	2.4	1.8	2.4	0	0	0.7	0.4	2.4
3 Axle Vehicles	1	10	0	11	1	0	0	1	1	12	0	13	0	1	0	1	26
% 3 Axle Vehicles	0.6	0.4	0	0.4	0.4	0	0	0.3	0.8	0.4	0	0.4	0	1.5	0	0.4	0.4
4+ Axle Trucks	0	83	1	84	0	0	0	0	0	58	0	58	0	0	1	1	143
% 4+ Axle Trucks	0	3.5	1.5	3.2	0	0	0	0	0	1.8	0	1.6	0	0	0.7	0.4	2.1

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	16	**337**	9	362	**50**	11	4	**65**	16	329	22	367	4	2	17	23	817
07:30 AM	13	315	10	338	35	16	3	54	11	381	32	424	4	10	**23**	37	853
07:45 AM	**35**	331	**17**	**383**	39	**19**	2	60	16	466	**41**	523	**7**	13	19	**39**	**1005**
08:00 AM	25	288	4	317	27	9	**7**	43	**22**	**494**	31	**547**	4	**16**	16	36	943
Total Volume	89	1271	40	1400	151	55	16	222	65	1670	126	1861	19	41	75	135	3618
% App. Total	6.4	90.8	2.9		68	24.8	7.2		3.5	89.7	6.8		14.1	30.4	55.6		
PHF	.636	.943	.588	.914	.755	.724	.571	.854	.739	.845	.768	.851	.679	.641	.815	.865	.900

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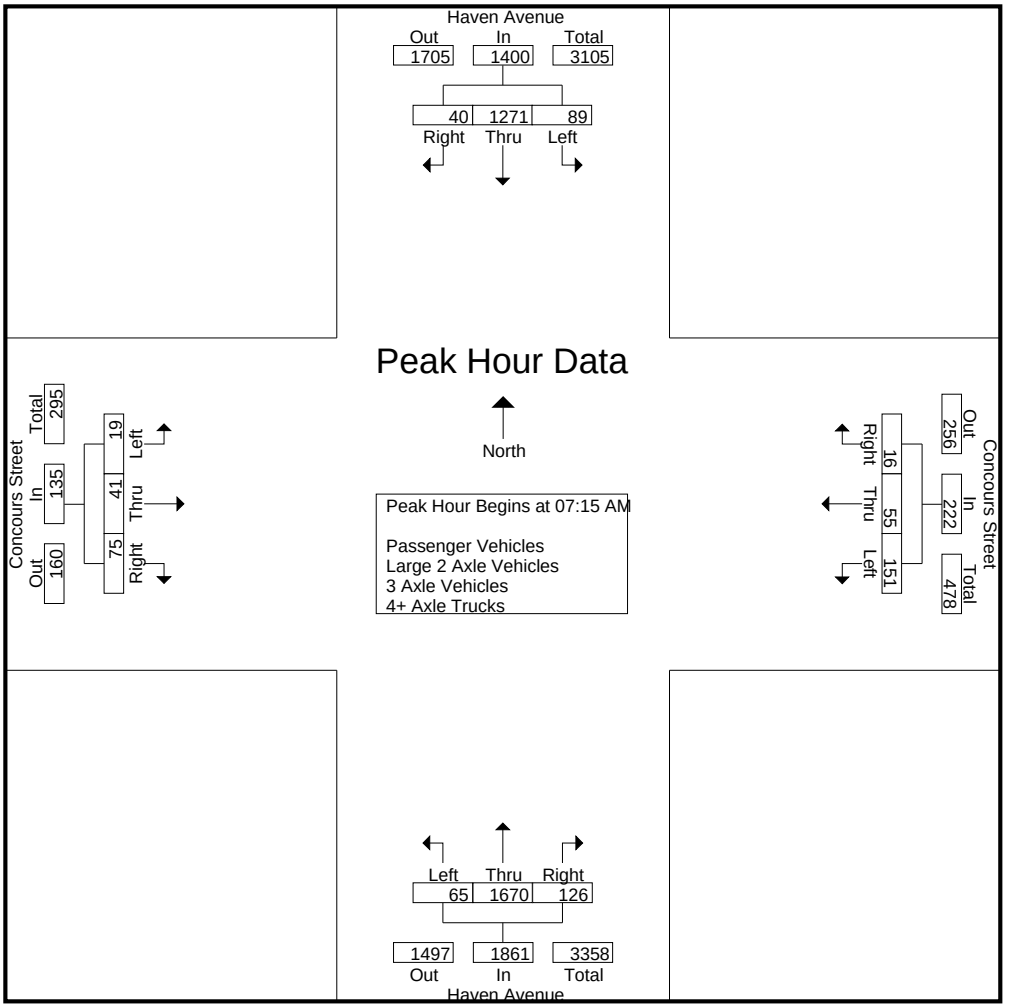
City of Rancho Cucamonga
N/S: Haven Avenue
E/W: Concours Street
Weather: Clear

File Name : 04_RNC_Haven_Concours AM
Site Code : 99919439
Start Date : 5/23/2019
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:30 AM				07:15 AM			
+0 mins.	19	312	6	337	38	7	0	45	11	381	32	424	4	2	17	23
+15 mins.	16	**337**	9	362	**50**	11	**4**	**65**	16	466	**41**	523	4	10	**23**	37
+30 mins.	13	315	10	338	35	16	3	54	**22**	**494**	31	**547**	**7**	13	19	**39**
+45 mins.	**35**	331	**17**	**383**	39	**19**	2	60	16	399	35	450	4	**16**	16	36
Total Volume	83	1295	42	1420	162	53	9	224	65	1740	139	1944	19	41	75	135
% App. Total	5.8	91.2	3		72.3	23.7	4		3.3	89.5	7.2		14.1	30.4	55.6	
PHF	.593	.961	.618	.927	.810	.697	.563	.862	.739	.881	.848	.888	.679	.641	.815	.865

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City of Rancho Cucamonga
N/S: Haven Avenue
E/W: Concours Street
Weather: Clear

File Name : 04_RNC_Haven_Concours AM
Site Code : 99919439
Start Date : 5/23/2019
Page No : 1

Groups Printed- Passenger Vehicles

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	19	288	6	313	37	7	0	44	11	332	24	367	2	5	19	26	750
07:15 AM	16	320	9	345	50	11	4	65	15	317	22	354	4	1	17	22	786
07:30 AM	13	300	10	323	35	16	3	54	11	371	31	413	4	10	23	37	827
07:45 AM	34	312	17	363	39	19	2	60	16	454	41	511	7	13	19	39	973
Total	82	1220	42	1344	161	53	9	223	53	1474	118	1645	17	29	78	124	3336
08:00 AM	25	271	4	300	26	8	7	41	22	466	30	518	4	16	16	36	895
08:15 AM	18	259	4	281	18	14	4	36	16	383	35	434	1	6	16	23	774
08:30 AM	17	234	5	256	29	9	3	41	12	362	21	395	3	10	20	33	725
08:45 AM	21	217	9	247	14	5	3	22	20	391	19	430	4	3	14	21	720
Total	81	981	22	1084	87	36	17	140	70	1602	105	1777	12	35	66	113	3114
Grand Total	163	2201	64	2428	248	89	26	363	123	3076	223	3422	29	64	144	237	6450
Apprch %	6.7	90.7	2.6		68.3	24.5	7.2		3.6	89.9	6.5		12.2	27	60.8		
Total %	2.5	34.1	1	37.6	3.8	1.4	0.4	5.6	1.9	47.7	3.5	53.1	0.4	1	2.2	3.7	

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	16	**320**	9	345	**50**	11	4	**65**	15	317	22	354	4	1	17	22	786
07:30 AM	13	300	10	323	35	16	3	54	11	371	31	413	4	10	**23**	37	827
07:45 AM	**34**	312	**17**	**363**	39	**19**	2	60	16	454	**41**	511	**7**	13	19	**39**	**973**
08:00 AM	25	271	4	300	26	8	**7**	41	**22**	**466**	30	**518**	4	**16**	16	36	895
Total Volume	88	1203	40	1331	150	54	16	220	64	1608	124	1796	19	40	75	134	3481
% App. Total	6.6	90.4	3		68.2	24.5	7.3		3.6	89.5	6.9		14.2	29.9	56		
PHF	.647	.940	.588	.917	.750	.711	.571	.846	.727	.863	.756	.867	.679	.625	.815	.859	.894

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City of Rancho Cucamonga
N/S: Haven Avenue
E/W: Concours Street
Weather: Clear

File Name : 04_RNC_Haven_Concours AM
Site Code : 99919439
Start Date : 5/23/2019
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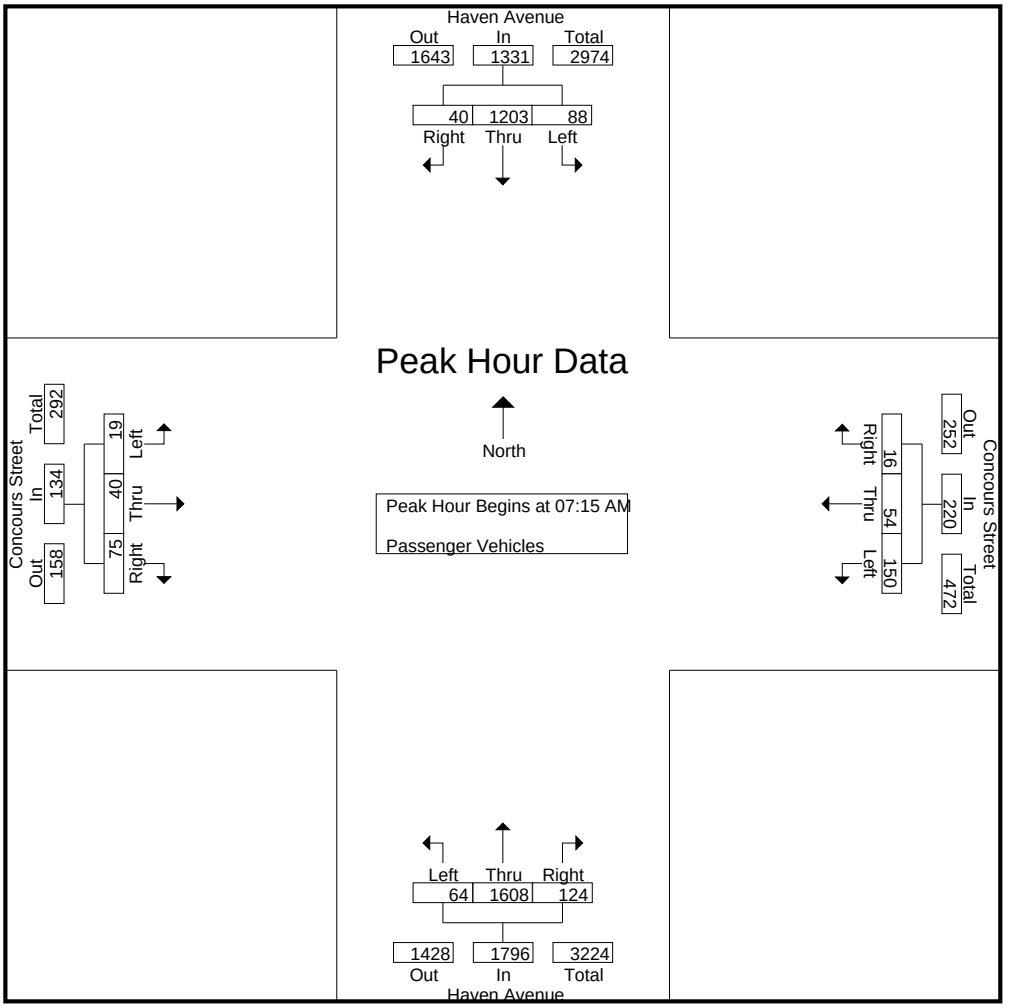

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:15 AM				07:15 AM			
+0 mins.	16	**320**	9	345	**50**	11	4	**65**	15	317	22	354	4	1	17	22
+15 mins.	13	300	10	323	35	16	3	54	11	371	31	413	4	10	**23**	37
+30 mins.	**34**	312	**17**	**363**	39	**19**	2	60	16	454	**41**	511	**7**	13	19	**39**
+45 mins.	25	271	4	300	26	8	**7**	41	**22**	**466**	30	**518**	4	**16**	16	36
Total Volume	88	1203	40	1331	150	54	16	220	64	1608	124	1796	19	40	75	134
% App. Total	6.6	90.4	3		68.2	24.5	7.3		3.6	89.5	6.9		14.2	29.9	56	
PHF	.647	.940	.588	.917	.750	.711	.571	.846	.727	.863	.756	.867	.679	.625	.815	.859

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City of Rancho Cucamonga
N/S: Haven Avenue
E/W: Concours Street
Weather: Clear

File Name : 04_RNC_Haven_Concours AM
Site Code : 99919439
Start Date : 5/23/2019
Page No : 1

Groups Printed- Large 2 Axle Vehicles

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	10	0	10	1	0	0	1	1	8	0	9	0	0	0	0	20
07:15 AM	0	8	0	8	0	0	0	0	0	9	0	9	0	0	0	0	17
07:30 AM	0	6	0	6	0	0	0	0	0	7	1	8	0	0	0	0	14
07:45 AM	0	8	0	8	0	0	0	0	0	5	0	5	0	0	0	0	13
Total	0	32	0	32	1	0	0	1	1	29	1	31	0	0	0	0	64
08:00 AM	0	4	0	4	1	1	0	2	0	11	1	12	0	0	0	0	18
08:15 AM	1	9	0	10	0	0	0	0	0	7	0	7	0	0	0	0	17
08:30 AM	0	13	0	13	2	0	0	2	0	13	1	14	0	0	0	0	29
08:45 AM	1	9	0	10	0	0	0	0	1	19	1	21	0	0	1	1	32
Total	2	35	0	37	3	1	0	4	1	50	3	54	0	0	1	1	96
Grand Total	2	67	0	69	4	1	0	5	2	79	4	85	0	0	1	1	160
Apprch %	2.9	97.1	0		80	20	0		2.4	92.9	4.7		0	0	100		
Total %	1.2	41.9	0	43.1	2.5	0.6	0	3.1	1.2	49.4	2.5	53.1	0	0	0.6	0.6	

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	**8**	0	**8**	0	0	0	0	0	9	0	9	0	0	0	0	17
07:30 AM	0	6	0	6	0	0	0	0	0	7	**1**	8	0	0	0	0	14
07:45 AM	0	8	0	8	0	0	0	0	0	5	0	5	0	0	0	0	13
08:00 AM	0	4	0	4	**1**	**1**	0	**2**	0	**11**	1	**12**	0	0	0	0	**18**
Total Volume	0	26	0	26	1	1	0	2	0	32	2	34	0	0	0	0	62
% App. Total	0	100	0		50	50	0		0	94.1	5.9		0	0	0		
PHF	.000	.813	.000	.813	.250	.250	.000	.250	.000	.727	.500	.708	.000	.000	.000	.000	.861

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City of Rancho Cucamonga
N/S: Haven Avenue
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File Name : 04_RNC_Haven_Concours AM
Site Code : 99919439
Start Date : 5/23/2019
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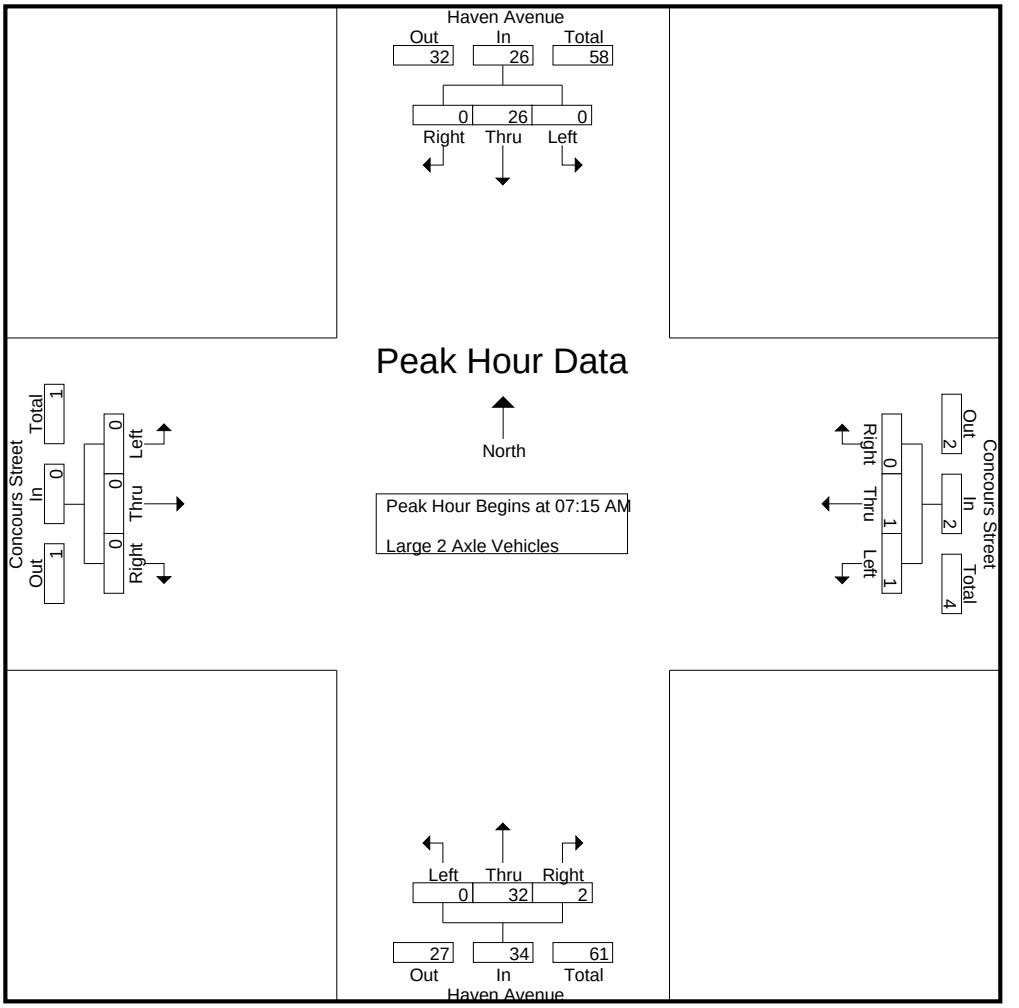

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:15 AM				07:15 AM			
+0 mins.	0	**8**	0	**8**	0	0	0	0	0	9	0	9	0	0	0	0
+15 mins.	0	6	0	6	0	0	0	0	0	7	**1**	8	0	0	0	0
+30 mins.	0	8	0	8	0	0	0	0	0	5	0	5	0	0	0	0
+45 mins.	0	4	0	4	**1**	**1**	0	**2**	0	**11**	1	**12**	0	0	0	0
Total Volume	0	26	0	26	1	1	0	2	0	32	2	34	0	0	0	0
% App. Total	0	100	0		50	50	0		0	94.1	5.9		0	0	0	
PHF	.000	.813	.000	.813	.250	.250	.000	.250	.000	.727	.500	.708	.000	.000	.000	.000

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City of Rancho Cucamonga
N/S: Haven Avenue
E/W: Concours Street
Weather: Clear

File Name : 04_RNC_Haven_Concours AM
Site Code : 99919439
Start Date : 5/23/2019
Page No : 1

Groups Printed- 3 Axle Vehicles

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	3	0	3	0	0	0	0	0	2	0	2	0	0	0	0	5
07:15 AM	0	1	0	1	0	0	0	0	1	0	0	1	0	1	0	1	3
07:30 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
07:45 AM	1	0	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
Total	1	5	0	6	0	0	0	0	1	5	0	6	0	1	0	1	13
08:00 AM	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
08:15 AM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
08:30 AM	0	2	0	2	0	0	0	0	0	1	0	1	0	0	0	0	3
08:45 AM	0	2	0	2	1	0	0	1	0	2	0	2	0	0	0	0	5
Total	0	5	0	5	1	0	0	1	0	7	0	7	0	0	0	0	13
Grand Total	1	10	0	11	1	0	0	1	1	12	0	13	0	1	0	1	26
Apprch %	9.1	90.9	0		100	0	0		7.7	92.3	0		0	100	0		
Total %	3.8	38.5	0	42.3	3.8	0	0	3.8	3.8	46.2	0	50	0	3.8	0	3.8	

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	**1**	0	**1**	0	0	0	0	**1**	0	0	1	0	**1**	0	**1**	**3**
07:30 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
07:45 AM	**1**	0	0	1	0	0	0	0	0	**2**	0	**2**	0	0	0	0	3
08:00 AM	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
Total Volume	1	3	0	4	0	0	0	0	1	5	0	6	0	1	0	1	11
% App. Total	25	75	0		0	0	0		16.7	83.3	0		0	100	0		
PHF	.250	.750	.000	1.00	.000	.000	.000	.000	.250	.625	.000	.750	.000	.250	.000	.250	.917

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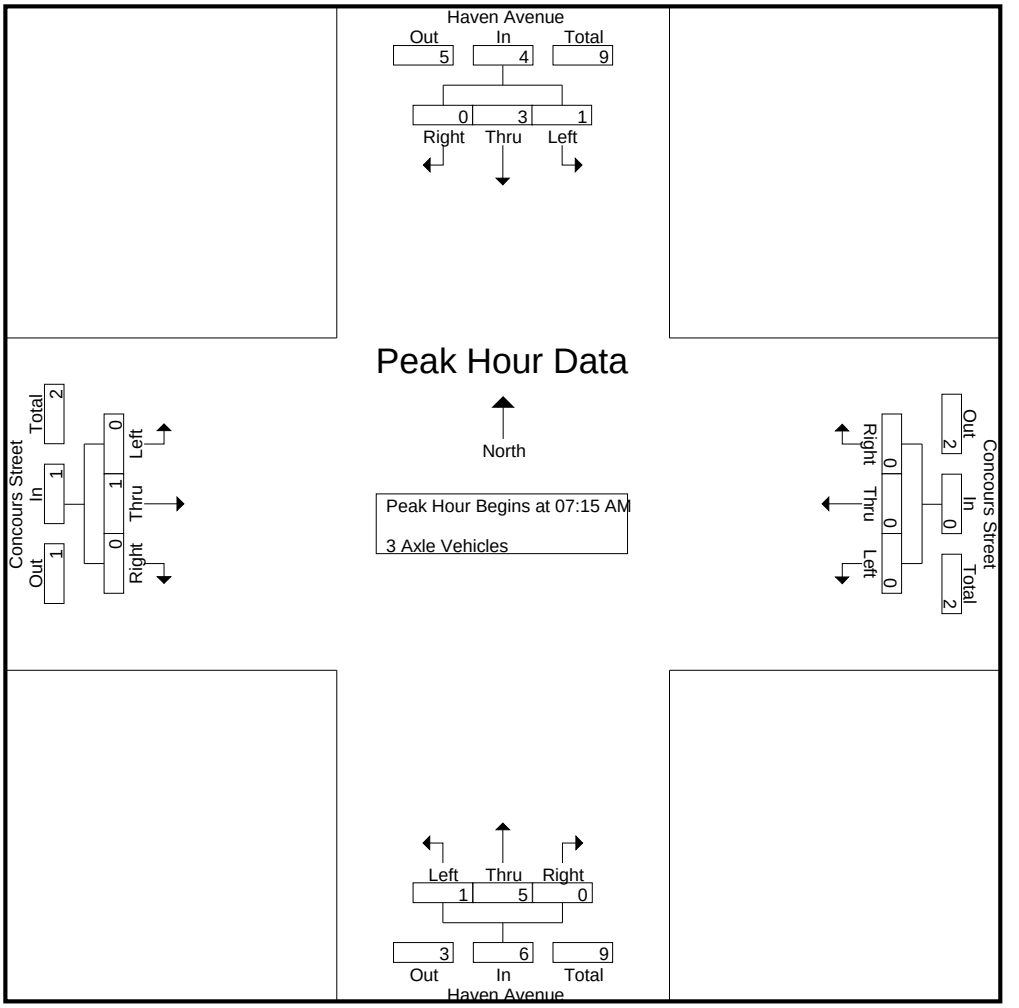
City of Rancho Cucamonga
N/S: Haven Avenue
E/W: Concours Street
Weather: Clear

File Name : 04_RNC_Haven_Concours AM
Site Code : 99919439
Start Date : 5/23/2019



Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:15 AM				07:15 AM			
+0 mins.	0	**1**	0	**1**	0	0	0	0	**1**	0	0	1	0	**1**	0	**1**
+15 mins.	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0
+30 mins.	**1**	0	0	1	0	0	0	0	0	**2**	0	**2**	0	0	0	0
+45 mins.	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0
Total Volume	1	3	0	4	0	0	0	0	1	5	0	6	0	1	0	1
% App. Total	25	75	0		0	0	0		16.7	83.3	0		0	100	0	
PHF	.250	.750	.000	1.000	.000	.000	.000	.000	.250	.625	.000	.750	.000	.250	.000	.250

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City of Rancho Cucamonga
N/S: Haven Avenue
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File Name : 04_RNC_Haven_Concours AM
Site Code : 99919439
Start Date : 5/23/2019
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Groups Printed- 4+ Axle Trucks

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	11	0	11	0	0	0	0	0	8	0	8	0	0	0	0	19
07:15 AM	0	8	0	8	0	0	0	0	0	3	0	3	0	0	0	0	11
07:30 AM	0	8	0	8	0	0	0	0	0	2	0	2	0	0	0	0	10
07:45 AM	0	11	0	11	0	0	0	0	0	5	0	5	0	0	0	0	16
Total	0	38	0	38	0	0	0	0	0	18	0	18	0	0	0	0	56
08:00 AM	0	12	0	12	0	0	0	0	0	15	0	15	0	0	0	0	27
08:15 AM	0	10	1	11	0	0	0	0	0	7	0	7	0	0	0	0	18
08:30 AM	0	13	0	13	0	0	0	0	0	9	0	9	0	0	1	1	23
08:45 AM	0	10	0	10	0	0	0	0	0	9	0	9	0	0	0	0	19
Total	0	45	1	46	0	0	0	0	0	40	0	40	0	0	1	1	87
Grand Total	0	83	1	84	0	0	0	0	0	58	0	58	0	0	1	1	143
Apprch %	0	98.8	1.2		0	0	0		0	100	0		0	0	100		
Total %	0	58	0.7	58.7	0	0	0	0	0	40.6	0	40.6	0	0	0.7	0.7	

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	8	0	8	0	0	0	0	0	3	0	3	0	0	0	0	11
07:30 AM	0	8	0	8	0	0	0	0	0	2	0	2	0	0	0	0	10
07:45 AM	0	11	0	11	0	0	0	0	0	5	0	5	0	0	0	0	16
08:00 AM	0	**12**	0	**12**	0	0	0	0	0	**15**	0	**15**	0	0	0	0	**27**
Total Volume	0	39	0	39	0	0	0	0	0	25	0	25	0	0	0	0	64
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.813	.000	.813	.000	.000	.000	.000	.000	.417	.000	.417	.000	.000	.000	.000	.593

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E/W: Concours Street
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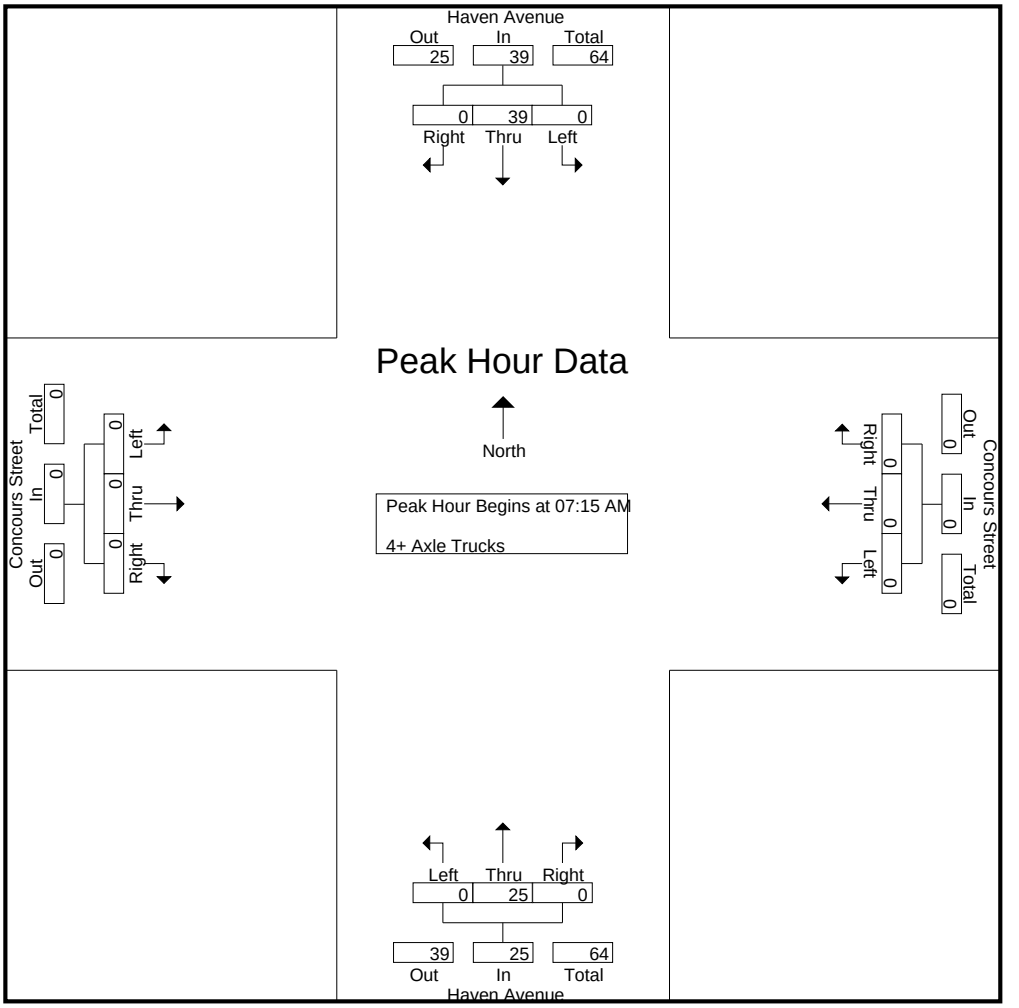
File Name : 04_RNC_Haven_Concours AM
Site Code : 99919439
Start Date : 5/23/2019



Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:15 AM				07:15 AM			
+0 mins.	0	8	0	8	0	0	0	0	0	3	0	3	0	0	0	0
+15 mins.	0	8	0	8	0	0	0	0	0	2	0	2	0	0	0	0
+30 mins.	0	11	0	11	0	0	0	0	0	5	0	5	0	0	0	0
+45 mins.	0	**12**	0	**12**	0	0	0	0	0	**15**	0	**15**	0	0	0	0
Total Volume	0	39	0	39	0	0	0	0	0	25	0	25	0	0	0	0
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0	
PHF	.000	.813	.000	.813	.000	.000	.000	.000	.000	.417	.000	.417	.000	.000	.000	.000

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City of Rancho Cucamonga
N/S: Haven Avenue
E/W: Concours Street
Weather: Clear

File Name : 04_RNC_Haven_Concours PM
Site Code : 99919439
Start Date : 5/23/2019
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	15	400	4	419	22	14	16	52	8	503	71	582	7	11	16	34	1087
04:15 PM	21	346	2	369	28	9	25	62	16	521	45	582	2	7	4	13	1026
04:30 PM	13	435	7	455	38	15	28	81	3	593	39	635	6	4	7	17	1188
04:45 PM	7	398	4	409	43	23	16	82	12	531	55	598	5	8	14	27	1116
Total	56	1579	17	1652	131	61	85	277	39	2148	210	2397	20	30	41	91	4417
05:00 PM	10	489	7	506	39	26	21	86	8	502	40	550	5	11	20	36	1178
05:15 PM	10	440	8	458	44	23	24	91	21	546	35	602	8	14	19	41	1192
05:30 PM	11	318	5	334	31	33	31	95	15	496	31	542	5	10	12	27	998
05:45 PM	8	317	11	336	40	16	30	86	11	500	43	554	7	6	10	23	999
Total	39	1564	31	1634	154	98	106	358	55	2044	149	2248	25	41	61	127	4367
Grand Total	95	3143	48	3286	285	159	191	635	94	4192	359	4645	45	71	102	218	8784
Apprch %	2.9	95.6	1.5		44.9	25	30.1		2	90.2	7.7		20.6	32.6	46.8		
Total %	1.1	35.8	0.5	37.4	3.2	1.8	2.2	7.2	1.1	47.7	4.1	52.9	0.5	0.8	1.2	2.5	
Passenger Vehicles	94	3045	47	3186	281	158	191	630	94	4078	355	4527	45	70	102	217	8560
% Passenger Vehicles	98.9	96.9	97.9	97	98.6	99.4	100	99.2	100	97.3	98.9	97.5	100	98.6	100	99.5	97.4
Large 2 Axle Vehicles	1	40	1	42	4	0	0	4	0	44	4	48	0	1	0	1	95
% Large 2 Axle Vehicles	1.1	1.3	2.1	1.3	1.4	0	0	0.6	0	1	1.1	1	0	1.4	0	0.5	1.1
3 Axle Vehicles	0	9	0	9	0	1	0	1	0	10	0	10	0	0	0	0	20
% 3 Axle Vehicles	0	0.3	0	0.3	0	0.6	0	0.2	0	0.2	0	0.2	0	0	0	0	0.2
4+ Axle Trucks	0	49	0	49	0	0	0	0	0	60	0	60	0	0	0	0	109
% 4+ Axle Trucks	0	1.6	0	1.5	0	0	0	0	0	1.4	0	1.3	0	0	0	0	1.2

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**13**	435	7	455	38	15	**28**	81	3	**593**	39	**635**	6	4	7	17	1188
04:45 PM	7	398	4	409	43	23	16	82	12	531	**55**	598	5	8	14	27	1116
05:00 PM	10	**489**	7	**506**	39	**26**	21	86	8	502	40	550	5	11	**20**	36	1178
05:15 PM	10	440	**8**	458	**44**	23	24	**91**	**21**	546	35	602	**8**	**14**	19	**41**	**1192**
Total Volume	40	1762	26	1828	164	87	89	340	44	2172	169	2385	24	37	60	121	4674
% App. Total	2.2	96.4	1.4		48.2	25.6	26.2		1.8	91.1	7.1		19.8	30.6	49.6		
PHF	.769	.901	.813	.903	.932	.837	.795	.934	.524	.916	.768	.939	.750	.661	.750	.738	.980

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City of Rancho Cucamonga
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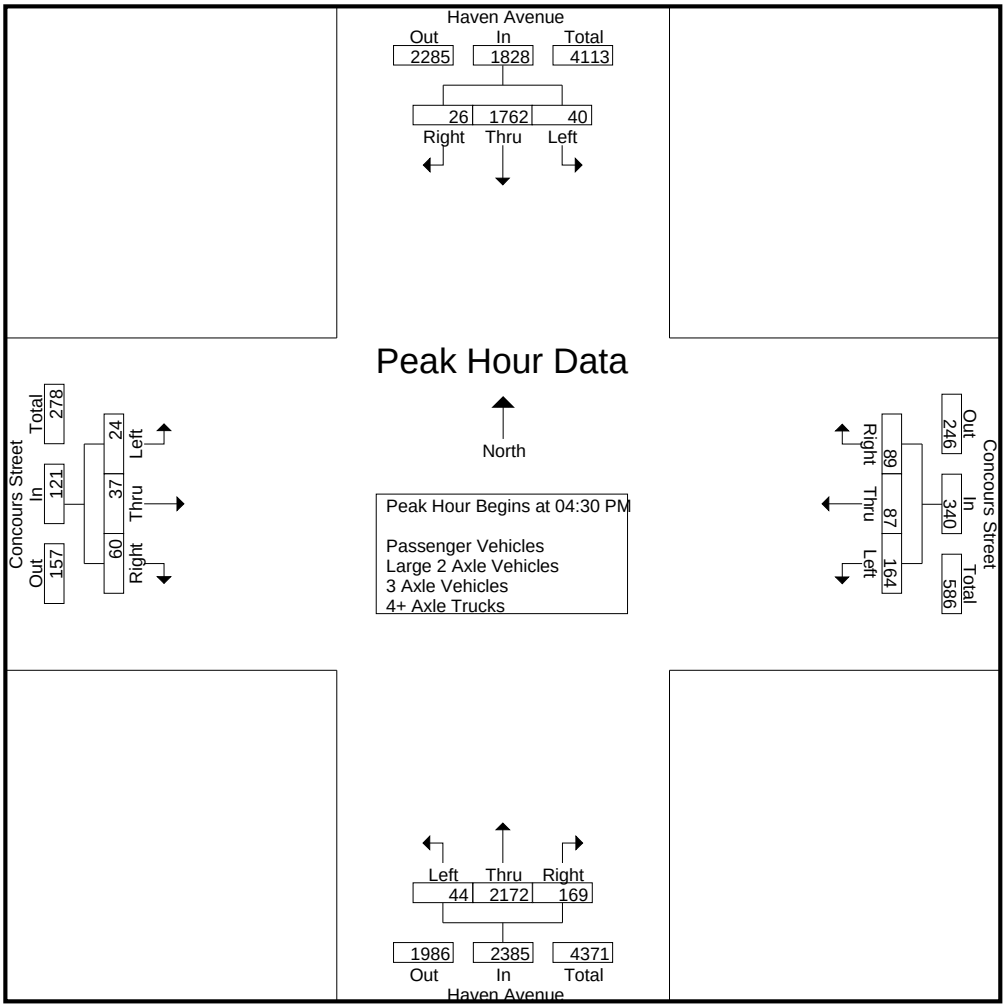
E/W: Concours Street
Weather: Clear

File Name : 04_RNC_Haven_Concours PM
Site Code : 99919439
Start Date : 5/23/2019
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				05:00 PM				04:00 PM				04:45 PM			
+0 mins.	**13**	435	7	455	39	26	21	86	8	503	**71**	582	5	8	14	27
+15 mins.	7	398	4	409	**44**	23	24	91	**16**	521	45	582	5	11	**20**	36
+30 mins.	10	**489**	7	**506**	31	**33**	**31**	**95**	3	**593**	39	**635**	**8**	**14**	19	**41**
+45 mins.	10	440	**8**	458	40	16	30	86	12	531	55	598	5	10	12	27
Total Volume	40	1762	26	1828	154	98	106	358	39	2148	210	2397	23	43	65	131
% App. Total	2.2	96.4	1.4		43	27.4	29.6		1.6	89.6	8.8		17.6	32.8	49.6	
PHF	.769	.901	.813	.903	.875	.742	.855	.942	.609	.906	.739	.944	.719	.768	.813	.799

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File Name : 04_RNC_Haven_Concours PM
Site Code : 99919439
Start Date : 5/23/2019
Page No : 1

Groups Printed- Passenger Vehicles

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	14	381	4	399	21	13	16	50	8	487	70	565	7	11	16	34	1048
04:15 PM	21	336	2	359	28	9	25	62	16	509	45	570	2	7	4	13	1004
04:30 PM	13	419	7	439	37	15	28	80	3	575	39	617	6	4	7	17	1153
04:45 PM	7	390	4	401	43	23	16	82	12	517	54	583	5	8	14	27	1093
Total	55	1526	17	1598	129	60	85	274	39	2088	208	2335	20	30	41	91	4298
05:00 PM	10	484	7	501	38	26	21	85	8	493	40	541	5	11	20	36	1163
05:15 PM	10	425	7	442	44	23	24	91	21	531	33	585	8	14	19	41	1159
05:30 PM	11	305	5	321	31	33	31	95	15	481	31	527	5	9	12	26	969
05:45 PM	8	305	11	324	39	16	30	85	11	485	43	539	7	6	10	23	971
Total	39	1519	30	1588	152	98	106	356	55	1990	147	2192	25	40	61	126	4262
Grand Total	94	3045	47	3186	281	158	191	630	94	4078	355	4527	45	70	102	217	8560
Apprch %	3	95.6	1.5		44.6	25.1	30.3		2.1	90.1	7.8		20.7	32.3	47		
Total %	1.1	35.6	0.5	37.2	3.3	1.8	2.2	7.4	1.1	47.6	4.1	52.9	0.5	0.8	1.2	2.5	

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**13**	419	**7**	439	37	15	**28**	80	3	**575**	39	**617**	6	4	7	17	1153
04:45 PM	7	390	4	401	43	23	16	82	12	517	**54**	583	5	8	14	27	1093
05:00 PM	10	**484**	7	**501**	38	**26**	21	85	8	493	40	541	5	11	**20**	36	**1163**
05:15 PM	10	425	7	442	**44**	23	24	**91**	**21**	531	33	585	**8**	**14**	19	**41**	1159
Total Volume	40	1718	25	1783	162	87	89	338	44	2116	166	2326	24	37	60	121	4568
% App. Total	2.2	96.4	1.4		47.9	25.7	26.3		1.9	91	7.1		19.8	30.6	49.6		
PHF	.769	.887	.893	.890	.920	.837	.795	.929	.524	.920	.769	.942	.750	.661	.750	.738	.982

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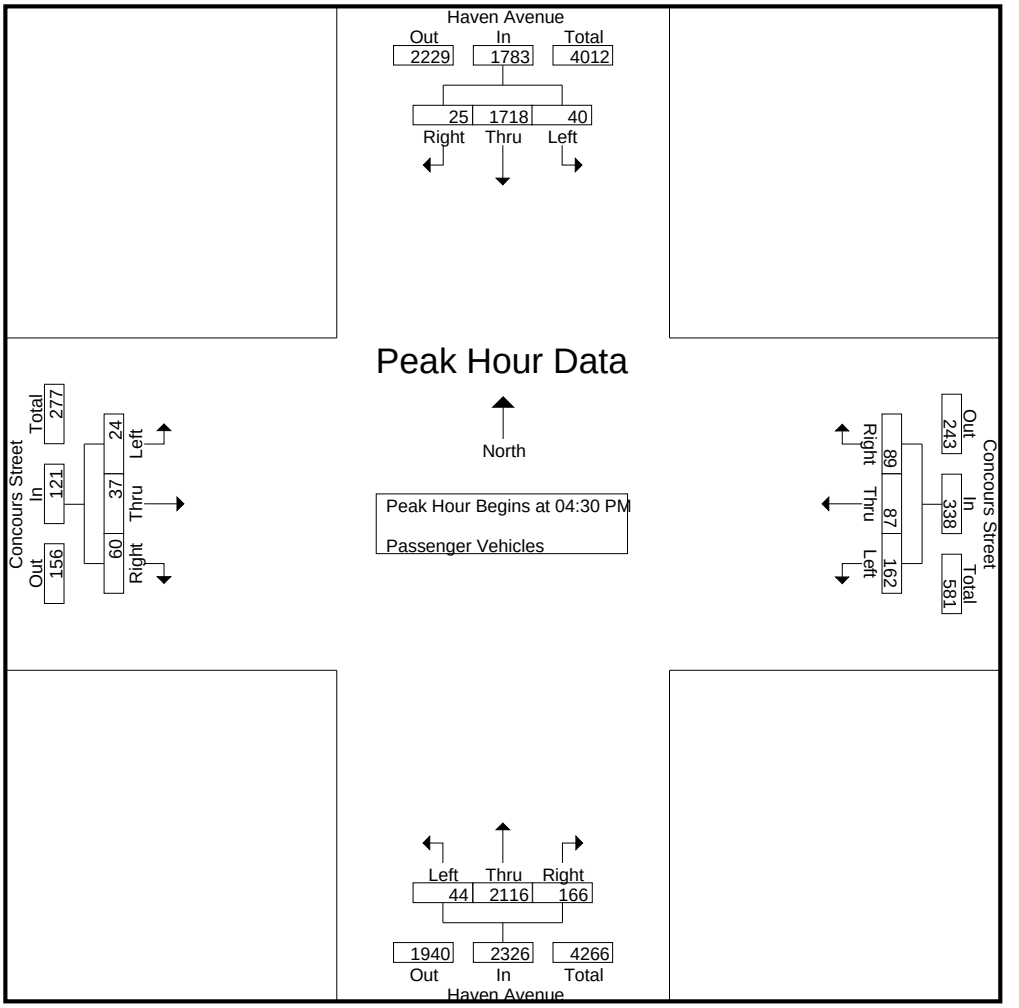

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	**13**	419	**7**	439	37	15	**28**	80	3	**575**	39	**617**	6	4	7	17
+15 mins.	7	390	4	401	43	23	16	82	12	517	**54**	583	5	8	14	27
+30 mins.	10	**484**	7	**501**	38	**26**	21	85	8	493	40	541	5	11	**20**	36
+45 mins.	10	425	7	442	**44**	23	24	**91**	**21**	531	33	585	**8**	**14**	19	**41**
Total Volume	40	1718	25	1783	162	87	89	338	44	2116	166	2326	24	37	60	121
% App. Total	2.2	96.4	1.4		47.9	25.7	26.3		1.9	91	7.1		19.8	30.6	49.6	
PHF	.769	.887	.893	.890	.920	.837	.795	.929	.524	.920	.769	.942	.750	.661	.750	.738

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File Name : 04_RNC_Haven_Concours PM
Site Code : 99919439
Start Date : 5/23/2019
Page No : 1

Groups Printed- Large 2 Axle Vehicles

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	1	9	0	10	1	0	0	1	0	9	1	10	0	0	0	0	21
04:15 PM	0	3	0	3	0	0	0	0	0	5	0	5	0	0	0	0	8
04:30 PM	0	4	0	4	1	0	0	1	0	6	0	6	0	0	0	0	11
04:45 PM	0	2	0	2	0	0	0	0	0	7	1	8	0	0	0	0	10
Total	1	18	0	19	2	0	0	2	0	27	2	29	0	0	0	0	50
05:00 PM	0	3	0	3	1	0	0	1	0	3	0	3	0	0	0	0	7
05:15 PM	0	8	1	9	0	0	0	0	0	2	2	4	0	0	0	0	13
05:30 PM	0	4	0	4	0	0	0	0	0	3	0	3	0	1	0	1	8
05:45 PM	0	7	0	7	1	0	0	1	0	9	0	9	0	0	0	0	17
Total	0	22	1	23	2	0	0	2	0	17	2	19	0	1	0	1	45
Grand Total	1	40	1	42	4	0	0	4	0	44	4	48	0	1	0	1	95
Apprch %	2.4	95.2	2.4		100	0	0		0	91.7	8.3		0	100	0		
Total %	1.1	42.1	1.1	44.2	4.2	0	0	4.2	0	46.3	4.2	50.5	0	1.1	0	1.1	

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	4	0	4	**1**	0	0	**1**	0	6	0	6	0	0	0	0	11
04:45 PM	0	2	0	2	0	0	0	0	0	**7**	1	**8**	0	0	0	0	10
05:00 PM	0	3	0	3	1	0	0	1	0	3	0	3	0	0	0	0	7
05:15 PM	0	**8**	**1**	**9**	0	0	0	0	0	2	**2**	4	0	0	0	0	**13**
Total Volume	0	17	1	18	2	0	0	2	0	18	3	21	0	0	0	0	41
% App. Total	0	94.4	5.6		100	0	0		0	85.7	14.3		0	0	0		
PHF	.000	.531	.250	.500	.500	.000	.000	.500	.000	.643	.375	.656	.000	.000	.000	.000	.788

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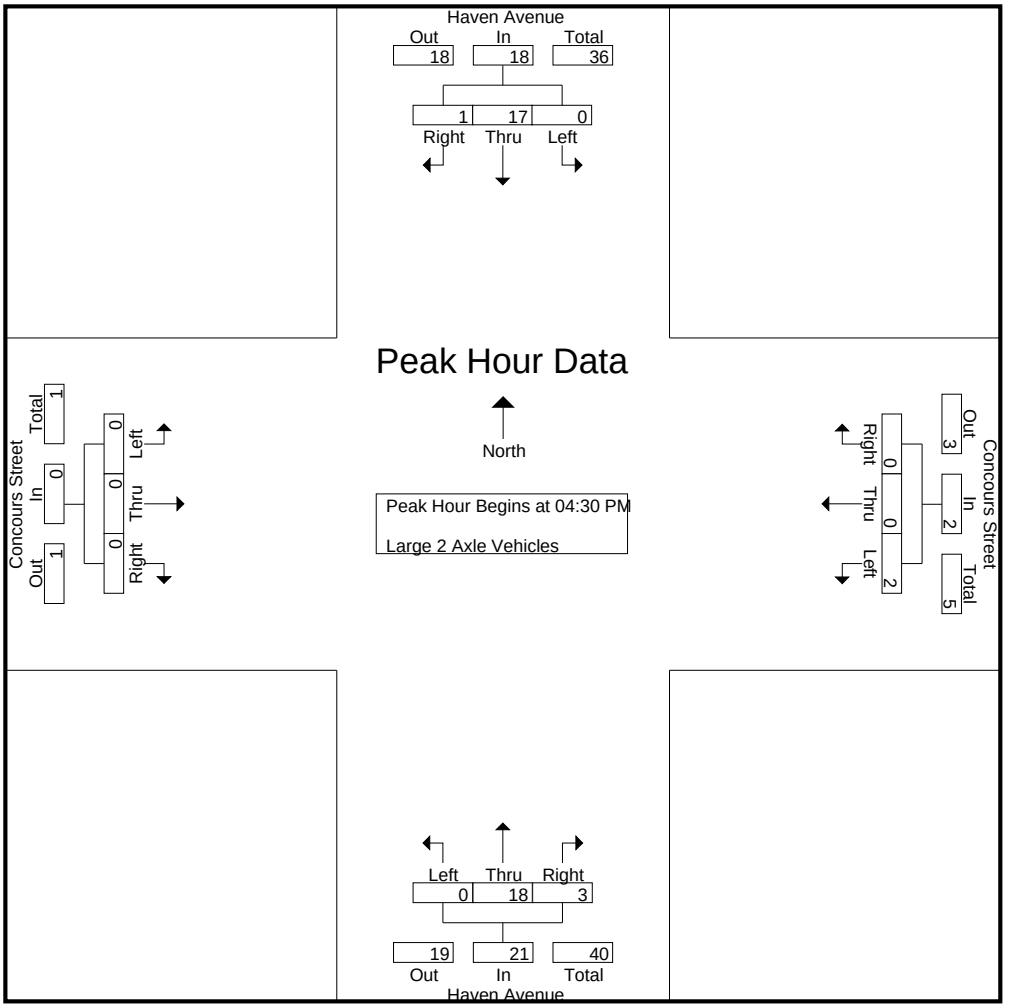
City of Rancho Cucamonga
N/S: Haven Avenue
E/W: Concours Street
Weather: Clear

File Name : 04_RNC_Haven_Concours PM
Site Code : 99919439
Start Date : 5/23/2019
Page No : 2



Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	0	4	0	4	**1**	0	0	**1**	0	6	0	6	0	0	0	0
+15 mins.	0	2	0	2	0	0	0	0	0	**7**	1	**8**	0	0	0	0
+30 mins.	0	3	0	3	1	0	0	1	0	3	0	3	0	0	0	0
+45 mins.	0	**8**	**1**	**9**	0	0	0	0	0	2	**2**	4	0	0	0	0
Total Volume	0	17	1	18	2	0	0	2	0	18	3	21	0	0	0	0
% App. Total	0	94.4	5.6		100	0	0		0	85.7	14.3		0	0	0	
PHF	.000	.531	.250	.500	.500	.000	.000	.500	.000	.643	.375	.656	.000	.000	.000	.000

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City of Rancho Cucamonga
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Weather: Clear

File Name : 04_RNC_Haven_Concours PM
Site Code : 99919439
Start Date : 5/23/2019
Page No : 1

Groups Printed- 3 Axle Vehicles

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
04:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	4	0	4	0	0	0	0	0	4	0	4	0	0	0	0	8
04:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	6	0	6	0	1	0	1	0	4	0	4	0	0	0	0	11
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:15 PM	0	2	0	2	0	0	0	0	0	3	0	3	0	0	0	0	5
05:30 PM	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	3	0	3	0	0	0	0	0	6	0	6	0	0	0	0	9
Grand Total	0	9	0	9	0	1	0	1	0	10	0	10	0	0	0	0	20
Apprch %	0	100	0		0	100	0		0	100	0		0	0	0		
Total %	0	45	0	45	0	5	0	5	0	50	0	50	0	0	0	0	

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	**4**	0	**4**	0	0	0	0	0	**4**	0	**4**	0	0	0	0	**8**
04:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:15 PM	0	2	0	2	0	0	0	0	0	3	0	3	0	0	0	0	5
Total Volume	0	7	0	7	0	0	0	0	0	8	0	8	0	0	0	0	15
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.438	.000	.438	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.469

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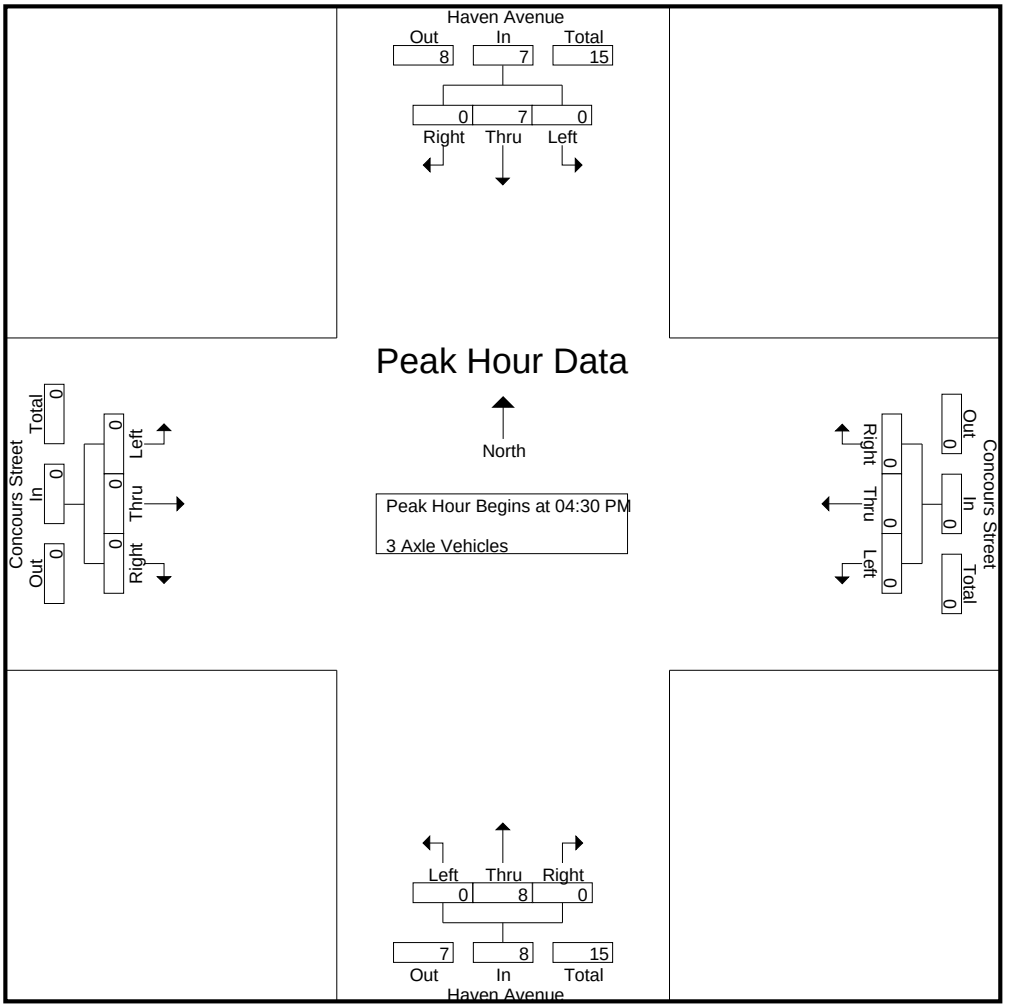
City of Rancho Cucamonga
N/S: Haven Avenue
E/W: Concours Street
Weather: Clear

File Name : 04_RNC_Haven_Concours PM
Site Code : 99919439
Start Date : 5/23/2019
Page No : 2



Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	0	**4**	0	**4**	0	0	0	0	0	**4**	0	**4**	0	0	0	0
+15 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
+45 mins.	0	2	0	2	0	0	0	0	0	3	0	3	0	0	0	0
Total Volume	0	7	0	7	0	0	0	0	0	8	0	8	0	0	0	0
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0	
PHF	.000	.438	.000	.438	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000

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File Name : 04_RNC_Haven_Concours PM
Site Code : 99919439
Start Date : 5/23/2019
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Groups Printed- 4+ Axle Trucks

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	10	0	10	0	0	0	0	0	7	0	7	0	0	0	0	17
04:15 PM	0	6	0	6	0	0	0	0	0	7	0	7	0	0	0	0	13
04:30 PM	0	8	0	8	0	0	0	0	0	8	0	8	0	0	0	0	16
04:45 PM	0	5	0	5	0	0	0	0	0	7	0	7	0	0	0	0	12
Total	0	29	0	29	0	0	0	0	0	29	0	29	0	0	0	0	58
05:00 PM	0	2	0	2	0	0	0	0	0	5	0	5	0	0	0	0	7
05:15 PM	0	5	0	5	0	0	0	0	0	10	0	10	0	0	0	0	15
05:30 PM	0	8	0	8	0	0	0	0	0	10	0	10	0	0	0	0	18
05:45 PM	0	5	0	5	0	0	0	0	0	6	0	6	0	0	0	0	11
Total	0	20	0	20	0	0	0	0	0	31	0	31	0	0	0	0	51
Grand Total	0	49	0	49	0	0	0	0	0	60	0	60	0	0	0	0	109
Apprch %	0	100	0		0	0	0		0	100	0		0	0	0		
Total %	0	45	0	45	0	0	0	0	0	55	0	55	0	0	0	0	

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	**8**	0	**8**	0	0	0	0	0	8	0	8	0	0	0	0	**16**
04:45 PM	0	5	0	5	0	0	0	0	0	7	0	7	0	0	0	0	12
05:00 PM	0	2	0	2	0	0	0	0	0	5	0	5	0	0	0	0	7
05:15 PM	0	5	0	5	0	0	0	0	0	**10**	0	**10**	0	0	0	0	15
Total Volume	0	20	0	20	0	0	0	0	0	30	0	30	0	0	0	0	50
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.625	.000	.625	.000	.000	.000	.000	.000	.750	.000	.750	.000	.000	.000	.000	.781

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Weather: Clear

File Name : 04_RNC_Haven_Concours PM
Site Code : 99919439
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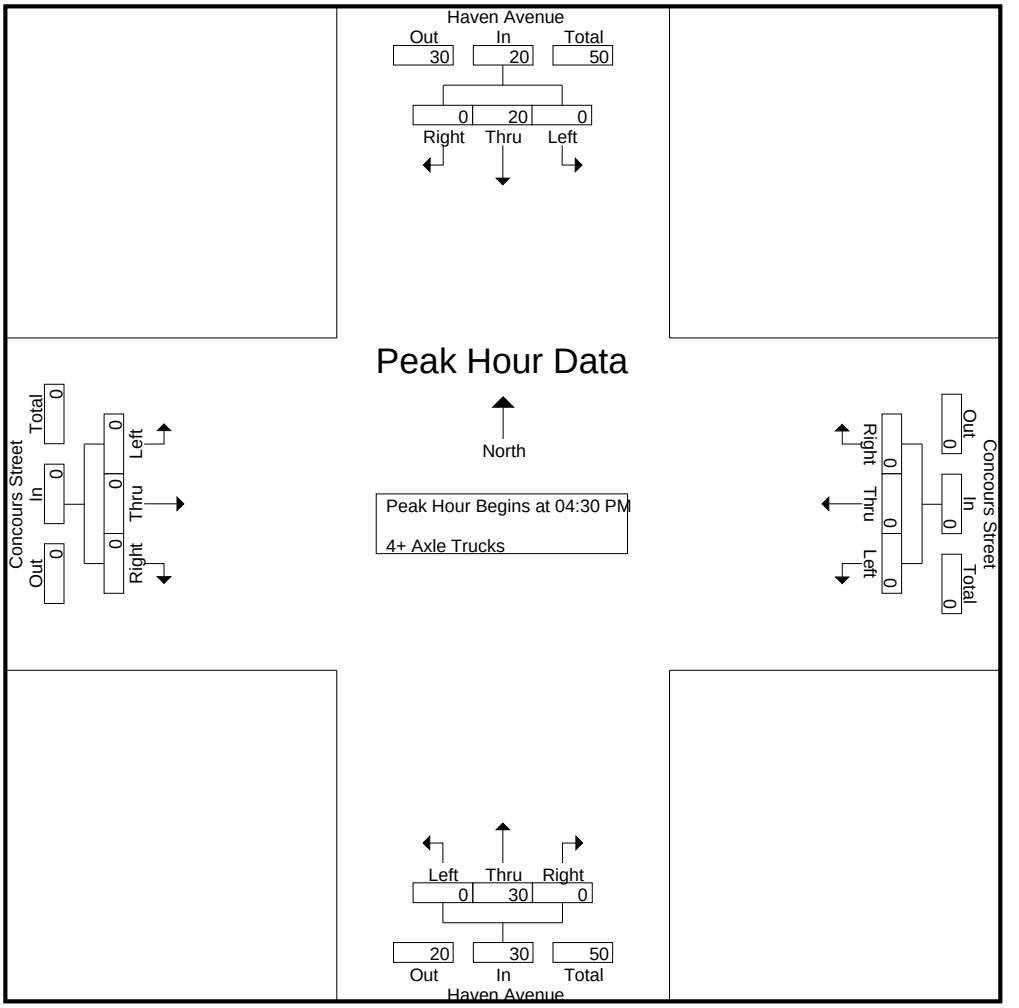

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	0	**8**	0	**8**	0	0	0	0	0	8	0	8	0	0	0	0
+15 mins.	0	5	0	5	0	0	0	0	0	7	0	7	0	0	0	0
+30 mins.	0	2	0	2	0	0	0	0	0	5	0	5	0	0	0	0
+45 mins.	0	5	0	5	0	0	0	0	0	**10**	0	**10**	0	0	0	0
Total Volume	0	20	0	20	0	0	0	0	0	30	0	30	0	0	0	0
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0	
PHF	.000	.625	.000	.625	.000	.000	.000	.000	.000	.750	.000	.750	.000	.000	.000	.000

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City of Ontario
N/S: Concours Street
E/W: Ontario Center Parkway
Weather: Clear

File Name : 09_ONT_Concours_Ontario Center_AM
Site Code : 10521235
Start Date : 5/27/2021
Page No : 1

Groups Printed- Total Volume

	Concours Street Southbound				Driveway Westbound				Concours Street Northbound				Ontario Center Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	98	8	106	0	0	0	0	5	66	2	73	1	0	2	3	182
07:15 AM	0	108	8	116	0	0	0	0	4	67	2	73	1	0	0	1	190
07:30 AM	1	122	9	132	2	1	0	3	11	78	5	94	0	0	0	0	229
07:45 AM	0	136	11	147	0	0	0	0	8	100	3	111	0	0	0	0	258
Total	1	464	36	501	2	1	0	3	28	311	12	351	2	0	2	4	859
08:00 AM	0	110	8	118	0	0	0	0	3	74	3	80	0	0	2	2	200
08:15 AM	0	116	12	128	0	0	1	1	5	99	4	108	0	0	0	0	237
08:30 AM	0	106	5	111	2	0	1	3	2	96	2	100	2	0	2	4	218
08:45 AM	0	114	4	118	1	0	1	2	7	97	3	107	4	0	0	4	231
Total	0	446	29	475	3	0	3	6	17	366	12	395	6	0	4	10	886
Grand Total	1	910	65	976	5	1	3	9	45	677	24	746	8	0	6	14	1745
Apprch %	0.1	93.2	6.7		55.6	11.1	33.3		6	90.8	3.2		57.1	0	42.9		
Total %	0.1	52.1	3.7	55.9	0.3	0.1	0.2	0.5	2.6	38.8	1.4	42.8	0.5	0	0.3	0.8	

	Concours Street Southbound				Driveway Westbound				Concours Street Northbound				Ontario Center Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**1**	122	9	132	**2**	**1**	0	**3**	**11**	78	**5**	94	0	0	0	0	229
07:45 AM	0	**136**	11	**147**	0	0	0	0	8	**100**	3	**111**	0	0	0	0	**258**
08:00 AM	0	110	8	118	0	0	0	0	3	74	3	80	0	0	**2**	**2**	200
08:15 AM	0	116	**12**	128	0	0	**1**	1	5	99	4	108	0	0	0	0	237
Total Volume	1	484	40	525	2	1	1	4	27	351	15	393	0	0	2	2	924
% App. Total	0.2	92.2	7.6		50	25	25		6.9	89.3	3.8		0	0	100		
PHF	.250	.890	.833	.893	.250	.250	.250	.333	.614	.878	.750	.885	.000	.000	.250	.250	.895

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City of Ontario
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Weather: Clear

File Name : 09_ONT_Concours_Ontario Center_AM
Site Code : 10521235
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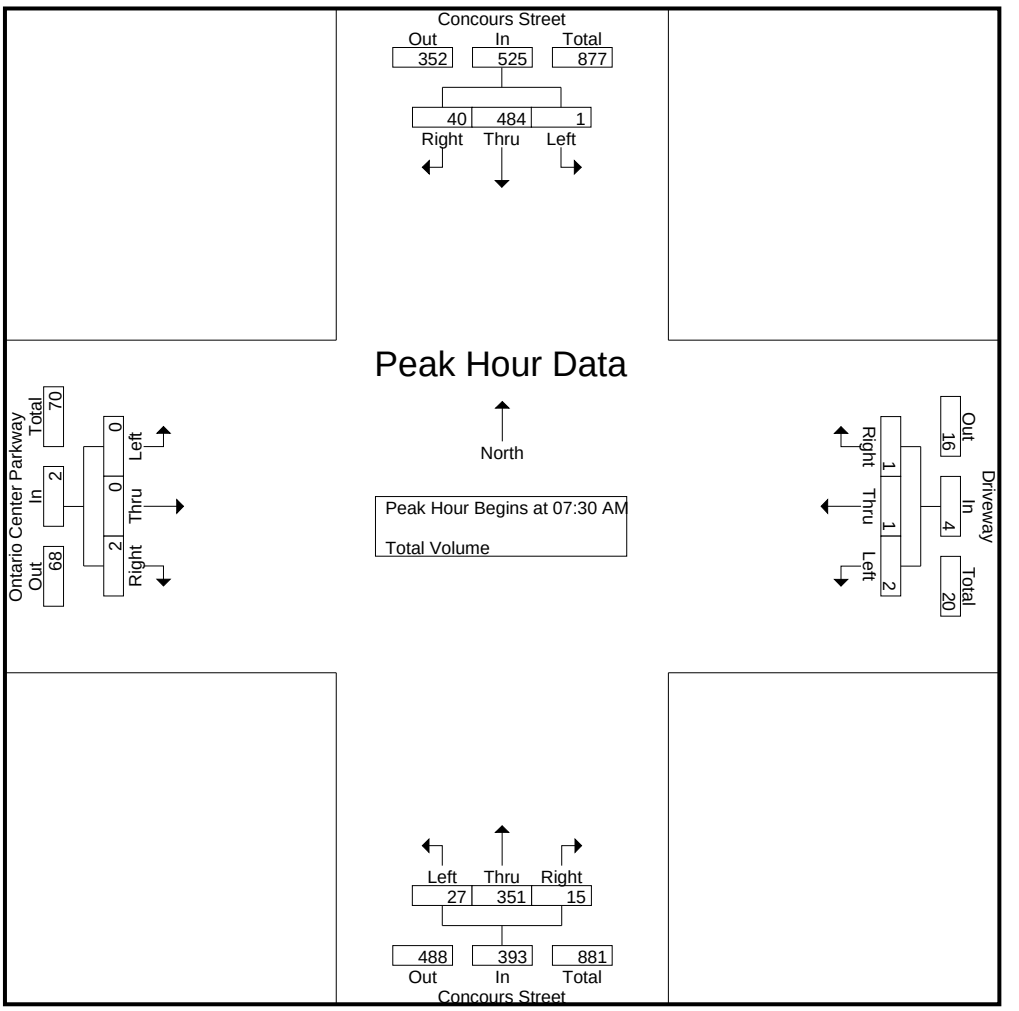

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				08:00 AM				07:45 AM				08:00 AM			
+0 mins.	**1**	122	9	132	0	0	0	0	**8**	**100**	3	**111**	0	0	**2**	2
+15 mins.	0	**136**	11	**147**	0	0	**1**	1	3	74	3	80	0	0	0	0
+30 mins.	0	110	8	118	**2**	0	1	**3**	5	99	**4**	108	2	0	2	**4**
+45 mins.	0	116	**12**	128	1	0	1	2	2	96	2	100	**4**	0	0	4
Total Volume	1	484	40	525	3	0	3	6	18	369	12	399	6	0	4	10
% App. Total	0.2	92.2	7.6		50	0	50		4.5	92.5	3		60	0	40	
PHF	.250	.890	.833	.893	.375	.000	.750	.500	.563	.923	.750	.899	.375	.000	.500	.625

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City of Ontario
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E/W: Ontario Center Parkway
Weather: Clear

File Name : 09_ONT_Concours_Ontario Center_PM
Site Code : 10521235
Start Date : 5/27/2021
Page No : 1

Groups Printed- Total Volume

	Concours Street Southbound				Driveway Westbound				Concours Street Northbound				Ontario Center Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	199	0	199	1	0	0	1	1	276	1	278	6	1	3	10	488
04:15 PM	0	190	1	191	1	0	0	1	3	290	3	296	6	0	1	7	495
04:30 PM	1	190	1	192	2	0	3	5	1	330	1	332	10	0	2	12	541
04:45 PM	0	206	2	208	1	0	3	4	0	286	0	286	5	0	1	6	504
Total	1	785	4	790	5	0	6	11	5	1182	5	1192	27	1	7	35	2028
05:00 PM	0	192	2	194	2	0	2	4	2	326	1	329	22	0	3	25	552
05:15 PM	0	189	1	190	3	0	0	3	0	292	1	293	5	0	2	7	493
05:30 PM	0	181	2	183	2	0	2	4	0	333	0	333	1	0	1	2	522
05:45 PM	1	208	5	214	3	0	3	6	1	326	2	329	5	0	3	8	557
Total	1	770	10	781	10	0	7	17	3	1277	4	1284	33	0	9	42	2124
Grand Total	2	1555	14	1571	15	0	13	28	8	2459	9	2476	60	1	16	77	4152
Apprch %	0.1	99	0.9		53.6	0	46.4		0.3	99.3	0.4		77.9	1.3	20.8		
Total %	0	37.5	0.3	37.8	0.4	0	0.3	0.7	0.2	59.2	0.2	59.6	1.4	0	0.4	1.9	

	Concours Street Southbound				Driveway Westbound				Concours Street Northbound				Ontario Center Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	192	2	194	2	0	2	4	**2**	326	1	329	**22**	0	**3**	**25**	552
05:15 PM	0	189	1	190	**3**	0	0	3	0	292	1	293	5	0	2	7	493
05:30 PM	0	181	2	183	2	0	2	4	0	**333**	0	**333**	1	0	1	2	522
05:45 PM	**1**	**208**	**5**	**214**	3	0	**3**	**6**	1	326	**2**	329	5	0	3	8	**557**
Total Volume	1	770	10	781	10	0	7	17	3	1277	4	1284	33	0	9	42	2124
% App. Total	0.1	98.6	1.3		58.8	0	41.2		0.2	99.5	0.3		78.6	0	21.4		
PHF	.250	.925	.500	.912	.833	.000	.583	.708	.375	.959	.500	.964	.375	.000	.750	.420	.953

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Weather: Clear

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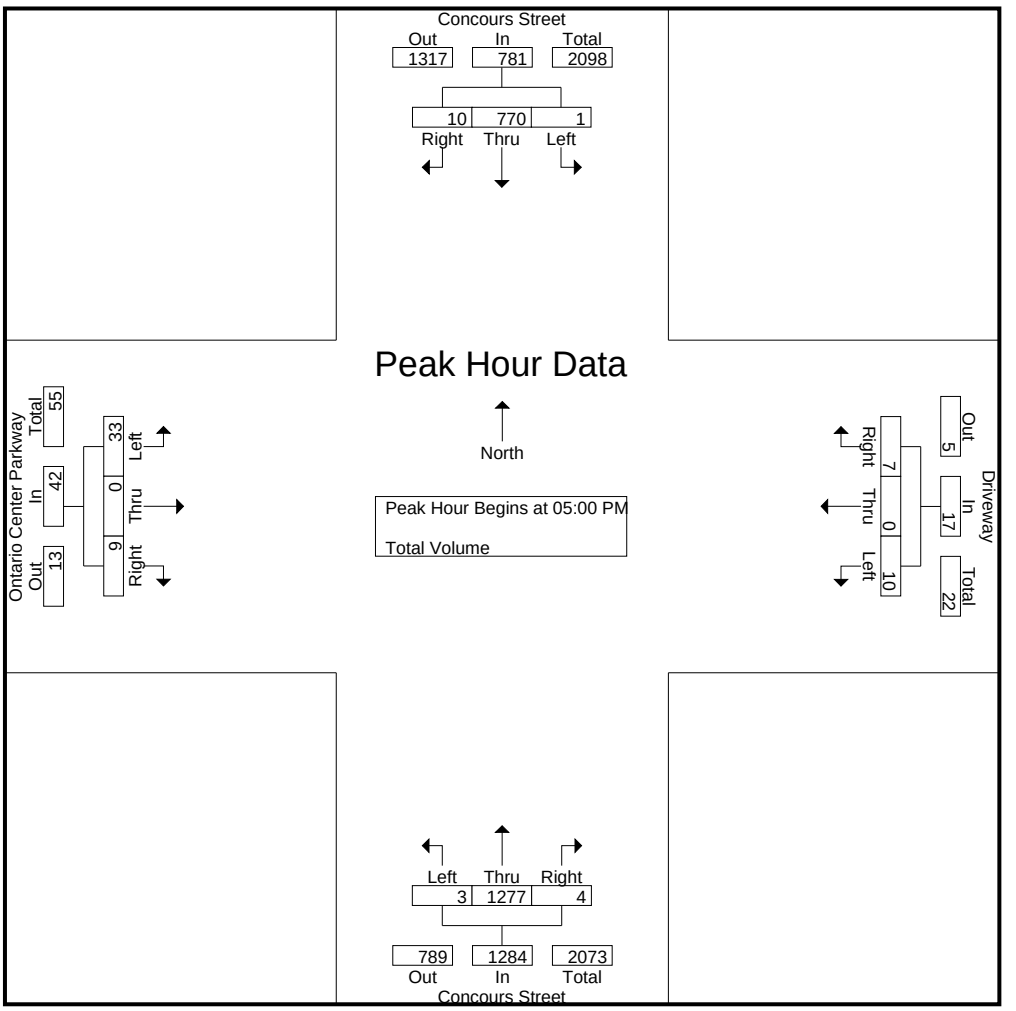
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				05:00 PM				05:00 PM				04:15 PM			
+0 mins.	0	199	0	199	2	0	2	4	**2**	326	1	329	6	0	1	7
+15 mins.	0	190	1	191	**3**	0	0	3	0	292	1	293	10	0	2	12
+30 mins.	**1**	190	1	192	2	0	2	4	0	**333**	0	**333**	5	0	1	6
+45 mins.	0	**206**	**2**	**208**	3	0	**3**	**6**	1	326	**2**	329	**22**	0	**3**	**25**
Total Volume	1	785	4	790	10	0	7	17	3	1277	4	1284	43	0	7	50
% App. Total	0.1	99.4	0.5		58.8	0	41.2		0.2	99.5	0.3		86	0	14	
PHF	.250	.953	.500	.950	.833	.000	.583	.708	.375	.959	.500	.964	.489	.000	.583	.500

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City of Ontario
N/S: Milliken Avenue
E/W: Concours Street
Weather: Clear

File Name : ONTMICOAM
Site Code : 04216253
Start Date : 7/6/2016
Page No : 1

Groups Printed- Total Volume

	Milliken Avenue Southbound				Concours Street Westbound				Milliken Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	11	149	28	188	9	5	2	16	28	117	5	150	7	2	4	13	367
07:15 AM	15	174	36	225	10	7	9	26	23	129	10	162	11	2	10	23	436
07:30 AM	12	184	61	257	14	14	11	39	25	198	21	244	14	6	13	33	573
07:45 AM	9	243	56	308	10	21	11	42	32	244	7	283	18	8	12	38	671
Total	47	750	181	978	43	47	33	123	108	688	43	839	50	18	39	107	2047
08:00 AM	13	163	46	222	10	20	3	33	49	196	14	259	16	2	12	30	544
08:15 AM	12	193	42	247	9	13	9	31	29	179	10	218	13	5	7	25	521
08:30 AM	14	190	25	229	12	19	2	33	23	147	5	175	25	8	6	39	476
08:45 AM	23	180	28	231	10	16	13	39	35	183	6	224	13	5	15	33	527
Total	62	726	141	929	41	68	27	136	136	705	35	876	67	20	40	127	2068
Grand Total	109	1476	322	1907	84	115	60	259	244	1393	78	1715	117	38	79	234	4115
Apprch %	5.7	77.4	16.9		32.4	44.4	23.2		14.2	81.2	4.5		50	16.2	33.8		
Total %	2.6	35.9	7.8	46.3	2	2.8	1.5	6.3	5.9	33.9	1.9	41.7	2.8	0.9	1.9	5.7	

	Milliken Avenue Southbound				Concours Street Westbound				Milliken Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	12	184	**61**	257	**14**	14	**11**	39	25	198	**21**	244	14	6	**13**	33	573
07:45 AM	9	**243**	56	**308**	10	**21**	11	**42**	32	**244**	7	**283**	**18**	**8**	12	**38**	**671**
08:00 AM	**13**	163	46	222	10	20	3	33	**49**	196	14	259	16	2	12	30	544
08:15 AM	12	193	42	247	9	13	9	31	29	179	10	218	13	5	7	25	521
Total Volume	46	783	205	1034	43	68	34	145	135	817	52	1004	61	21	44	126	2309
% App. Total	4.4	75.7	19.8		29.7	46.9	23.4		13.4	81.4	5.2		48.4	16.7	34.9		
PHF	.885	.806	.840	.839	.768	.810	.773	.863	.689	.837	.619	.887	.847	.656	.846	.829	.860

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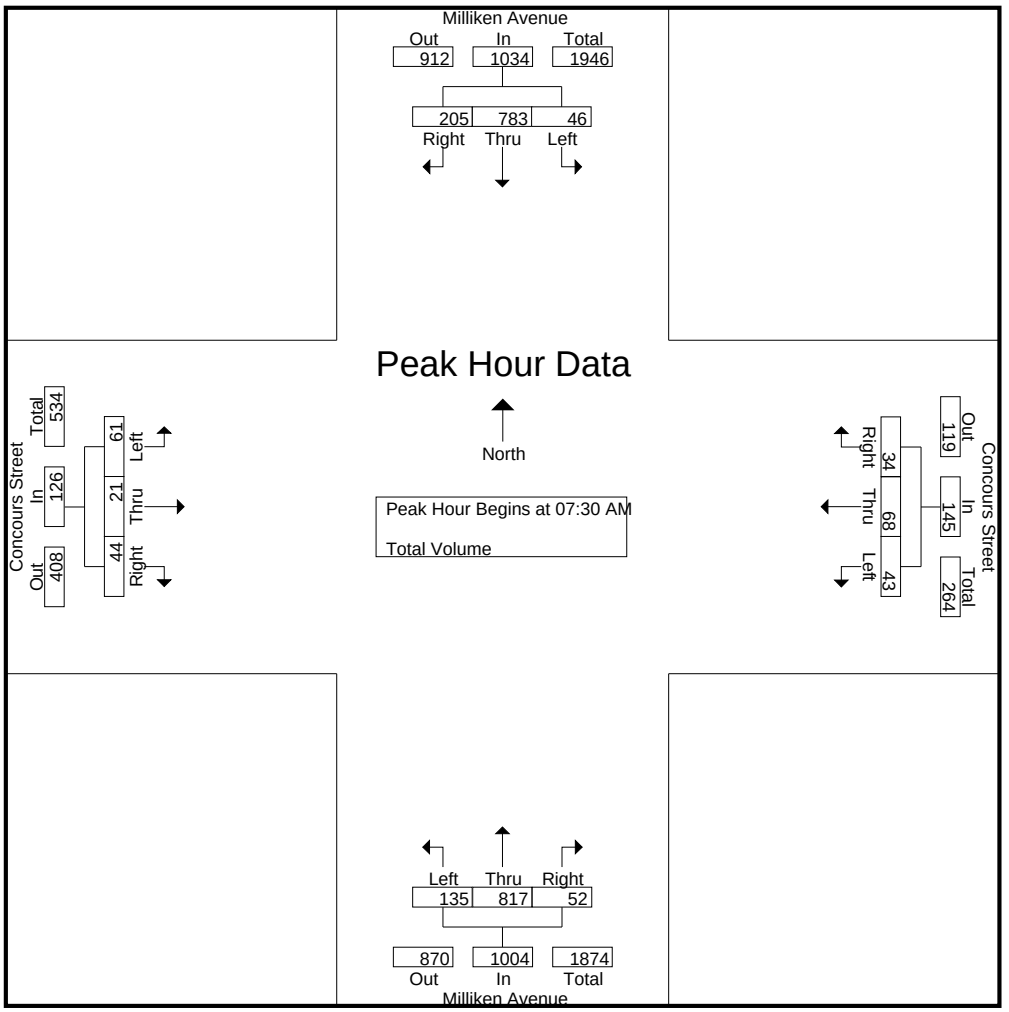

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:45 AM			
+0 mins.	12	184	**61**	257	**14**	14	**11**	39	25	198	**21**	244	18	**8**	**12**	38
+15 mins.	9	**243**	56	**308**	10	**21**	11	**42**	32	**244**	7	**283**	16	2	12	30
+30 mins.	**13**	163	46	222	10	20	3	33	**49**	196	14	259	13	5	7	25
+45 mins.	12	193	42	247	9	13	9	31	29	179	10	218	**25**	8	6	**39**
Total Volume	46	783	205	1034	43	68	34	145	135	817	52	1004	72	23	37	132
% App. Total	4.4	75.7	19.8		29.7	46.9	23.4		13.4	81.4	5.2		54.5	17.4	28	
PHF	.885	.806	.840	.839	.768	.810	.773	.863	.689	.837	.619	.887	.720	.719	.771	.846

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City of Ontario
N/S: Milliken Avenue
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Weather: Clear

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Groups Printed- Total Volume

	Milliken Avenue Southbound				Concours Street Westbound				Milliken Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	100	249	15	364	28	20	27	75	43	262	34	339	65	17	33	115	893
04:15 PM	63	199	21	283	37	18	17	72	40	254	31	325	74	24	37	135	815
04:30 PM	52	246	24	322	32	10	21	63	55	280	18	353	57	16	46	119	857
04:45 PM	51	269	26	346	50	20	18	88	43	333	26	402	55	20	32	107	943
Total	266	963	86	1315	147	68	83	298	181	1129	109	1419	251	77	148	476	3508
05:00 PM	28	291	33	352	28	14	23	65	38	345	25	408	83	43	30	156	981
05:15 PM	44	260	28	332	34	13	28	75	37	402	31	470	90	25	31	146	1023
05:30 PM	37	259	25	321	38	13	32	83	44	368	31	443	67	28	32	127	974
05:45 PM	34	210	20	264	33	15	17	65	40	301	31	372	75	18	23	116	817
Total	143	1020	106	1269	133	55	100	288	159	1416	118	1693	315	114	116	545	3795
Grand Total	409	1983	192	2584	280	123	183	586	340	2545	227	3112	566	191	264	1021	7303
Apprch %	15.8	76.7	7.4		47.8	21	31.2		10.9	81.8	7.3		55.4	18.7	25.9		
Total %	5.6	27.2	2.6	35.4	3.8	1.7	2.5	8	4.7	34.8	3.1	42.6	7.8	2.6	3.6	14	

	Milliken Avenue Southbound				Concours Street Westbound				Milliken Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**51**	269	26	346	**50**	**20**	18	**88**	43	333	26	402	55	20	**32**	107	943
05:00 PM	28	**291**	**33**	**352**	28	14	23	65	38	345	25	408	83	**43**	30	**156**	981
05:15 PM	44	260	28	332	34	13	28	75	37	**402**	**31**	**470**	**90**	25	31	146	**1023**
05:30 PM	37	259	25	321	38	13	**32**	83	**44**	368	31	443	67	28	32	127	974
Total Volume	160	1079	112	1351	150	60	101	311	162	1448	113	1723	295	116	125	536	3921
% App. Total	11.8	79.9	8.3		48.2	19.3	32.5		9.4	84	6.6		55	21.6	23.3		
PHF	.784	.927	.848	.960	.750	.750	.789	.884	.920	.900	.911	.916	.819	.674	.977	.859	.958

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File Name : ONTMICOPM
Site Code : 04216253
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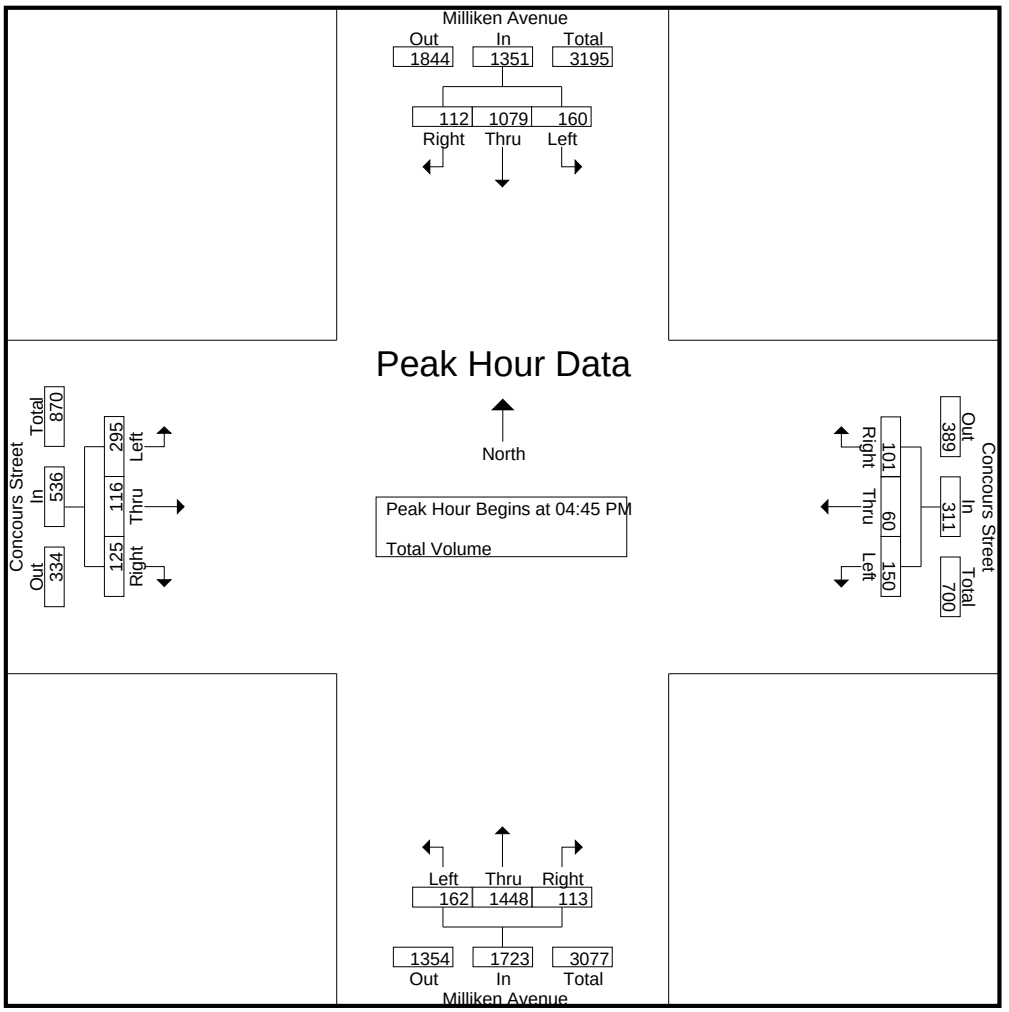

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:45 PM				04:45 PM				05:00 PM			
+0 mins.	**52**	246	24	322	**50**	**20**	18	**88**	43	333	26	402	83	**43**	30	**156**
+15 mins.	51	269	26	346	28	14	23	65	38	345	25	408	**90**	25	31	146
+30 mins.	28	**291**	**33**	**352**	34	13	28	75	37	**402**	**31**	**470**	67	28	**32**	127
+45 mins.	44	260	28	332	38	13	**32**	83	**44**	368	31	443	75	18	23	116
Total Volume	175	1066	111	1352	150	60	101	311	162	1448	113	1723	315	114	116	545
% App. Total	12.9	78.8	8.2		48.2	19.3	32.5		9.4	84	6.6		57.8	20.9	21.3	
PHF	.841	.916	.841	.960	.750	.750	.789	.884	.920	.900	.911	.916	.875	.663	.906	.873

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City of Ontario
N/S: Haven Avenue
E/W: Inland Empire Boulevard
Weather: Clear

File Name : ONTHAINAM
Site Code : 04216253
Start Date : 7/6/2016
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Groups Printed- Total Volume

	Haven Avenue Southbound				Inland Empire Boulevard Westbound				Haven Avenue Northbound				Inland Empire Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	4	259	6	269	11	8	1	20	53	343	39	435	7	10	44	61	785
07:15 AM	10	278	12	300	20	16	2	38	68	388	71	527	3	12	43	58	923
07:30 AM	13	312	14	339	28	27	7	62	105	385	128	618	10	12	54	76	1095
07:45 AM	14	303	21	338	30	24	2	56	117	525	115	757	16	28	42	86	1237
Total	41	1152	53	1246	89	75	12	176	343	1641	353	2337	36	62	183	281	4040
08:00 AM	6	284	21	311	20	24	8	52	96	412	173	681	14	26	61	101	1145
08:15 AM	12	279	9	300	24	15	1	40	82	489	147	718	6	19	51	76	1134
08:30 AM	7	257	13	277	41	15	5	61	86	395	122	603	9	19	54	82	1023
08:45 AM	6	313	21	340	30	24	13	67	102	437	118	657	14	18	60	92	1156
Total	31	1133	64	1228	115	78	27	220	366	1733	560	2659	43	82	226	351	4458
Grand Total	72	2285	117	2474	204	153	39	396	709	3374	913	4996	79	144	409	632	8498
Apprch %	2.9	92.4	4.7		51.5	38.6	9.8		14.2	67.5	18.3		12.5	22.8	64.7		
Total %	0.8	26.9	1.4	29.1	2.4	1.8	0.5	4.7	8.3	39.7	10.7	58.8	0.9	1.7	4.8	7.4	

	Haven Avenue Southbound				Inland Empire Boulevard Westbound				Haven Avenue Northbound				Inland Empire Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	13	**312**	14	**339**	28	**27**	7	**62**	105	385	128	618	10	12	54	76	1095
07:45 AM	**14**	303	**21**	338	**30**	24	2	56	**117**	**525**	115	**757**	**16**	**28**	42	86	**1237**
08:00 AM	6	284	21	311	20	24	**8**	52	96	412	**173**	681	14	26	**61**	**101**	1145
08:15 AM	12	279	9	300	24	15	1	40	82	489	147	718	6	19	51	76	1134
Total Volume	45	1178	65	1288	102	90	18	210	400	1811	563	2774	46	85	208	339	4611
% App. Total	3.5	91.5	5		48.6	42.9	8.6		14.4	65.3	20.3		13.6	25.1	61.4		
PHF	.804	.944	.774	.950	.850	.833	.563	.847	.855	.862	.814	.916	.719	.759	.852	.839	.932

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City of Ontario
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E/W: Inland Empire Boulevard
Weather: Clear

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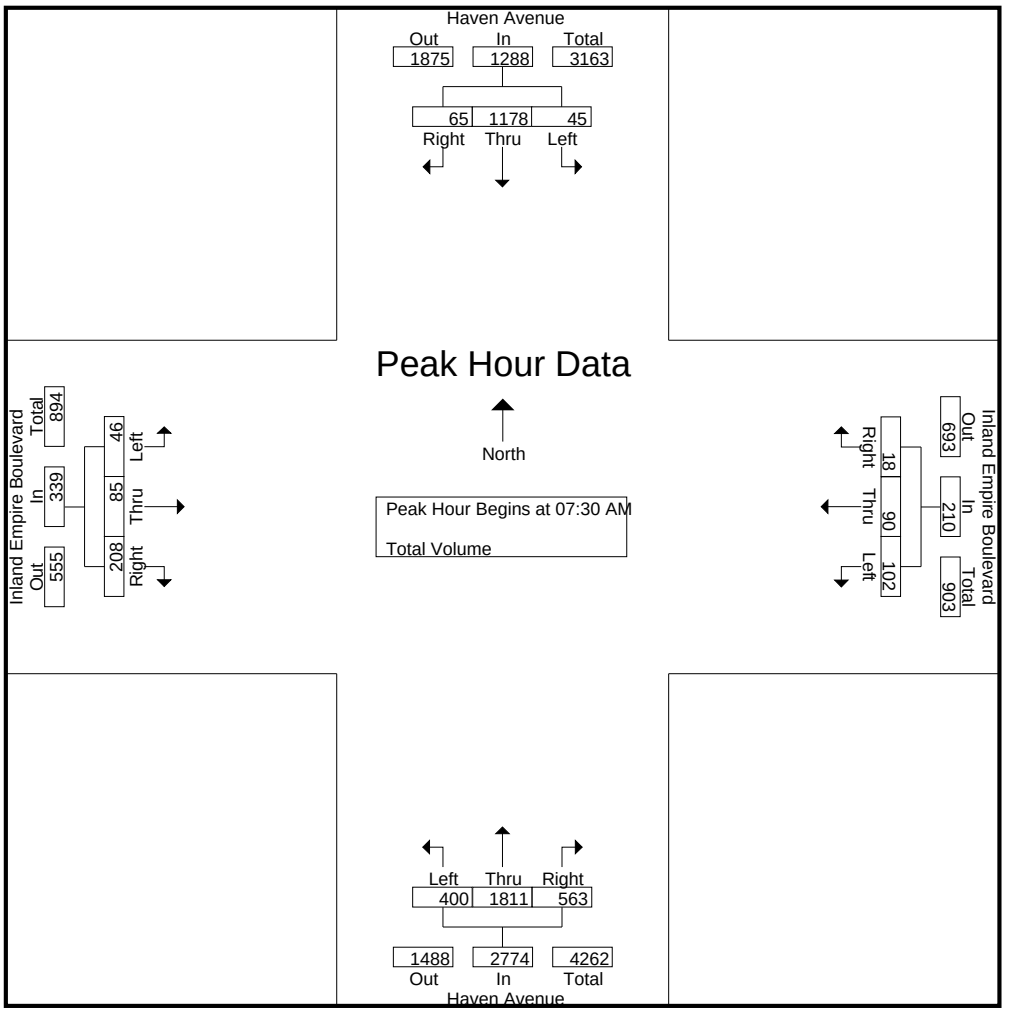

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				08:00 AM				07:30 AM				08:00 AM			
+0 mins.	10	278	12	300	20	**24**	8	52	105	385	128	618	**14**	**26**	**61**	**101**
+15 mins.	13	**312**	14	**339**	24	15	1	40	**117**	**525**	115	**757**	6	19	51	76
+30 mins.	**14**	303	**21**	338	**41**	15	5	61	96	412	**173**	681	9	19	54	82
+45 mins.	6	284	21	311	30	24	**13**	**67**	82	489	147	718	14	18	60	92
Total Volume	43	1177	68	1288	115	78	27	220	400	1811	563	2774	43	82	226	351
% App. Total	3.3	91.4	5.3		52.3	35.5	12.3		14.4	65.3	20.3		12.3	23.4	64.4	
PHF	.768	.943	.810	.950	.701	.813	.519	.821	.855	.862	.814	.916	.768	.788	.926	.869

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City of Ontario
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Groups Printed- Total Volume

	Haven Avenue Southbound				Inland Empire Boulevard Westbound				Haven Avenue Northbound				Inland Empire Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	7	524	17	548	108	31	13	152	60	421	95	576	23	29	83	135	1411
04:15 PM	11	431	6	448	89	29	9	127	76	399	85	560	29	28	77	134	1269
04:30 PM	7	454	12	473	130	30	6	166	71	384	73	528	30	47	125	202	1369
04:45 PM	7	427	12	446	103	32	12	147	84	428	96	608	31	44	100	175	1376
Total	32	1836	47	1915	430	122	40	592	291	1632	349	2272	113	148	385	646	5425
05:00 PM	10	481	7	498	198	41	7	246	90	417	102	609	37	52	120	209	1562
05:15 PM	12	566	9	587	124	34	10	168	61	420	108	589	50	47	75	172	1516
05:30 PM	17	362	9	388	126	25	12	163	73	418	99	590	31	38	75	144	1285
05:45 PM	14	351	15	380	88	36	6	130	66	403	116	585	18	44	69	131	1226
Total	53	1760	40	1853	536	136	35	707	290	1658	425	2373	136	181	339	656	5589
Grand Total	85	3596	87	3768	966	258	75	1299	581	3290	774	4645	249	329	724	1302	11014
Apprch %	2.3	95.4	2.3		74.4	19.9	5.8		12.5	70.8	16.7		19.1	25.3	55.6		
Total %	0.8	32.6	0.8	34.2	8.8	2.3	0.7	11.8	5.3	29.9	7	42.2	2.3	3	6.6	11.8	

	Haven Avenue Southbound				Inland Empire Boulevard Westbound				Haven Avenue Northbound				Inland Empire Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	7	454	**12**	473	130	30	6	166	71	384	73	528	30	47	**125**	202	1369
04:45 PM	7	427	12	446	103	32	**12**	147	84	**428**	96	608	31	44	100	175	1376
05:00 PM	10	481	7	498	**198**	**41**	7	**246**	**90**	417	102	**609**	37	**52**	120	**209**	**1562**
05:15 PM	**12**	**566**	9	**587**	124	34	10	168	61	420	**108**	589	**50**	47	75	172	1516
Total Volume	36	1928	40	2004	555	137	35	727	306	1649	379	2334	148	190	420	758	5823
% App. Total	1.8	96.2	2		76.3	18.8	4.8		13.1	70.7	16.2		19.5	25.1	55.4		
PHF	.750	.852	.833	.853	.701	.835	.729	.739	.850	.963	.877	.958	.740	.913	.840	.907	.932

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City of Ontario
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Weather: Clear

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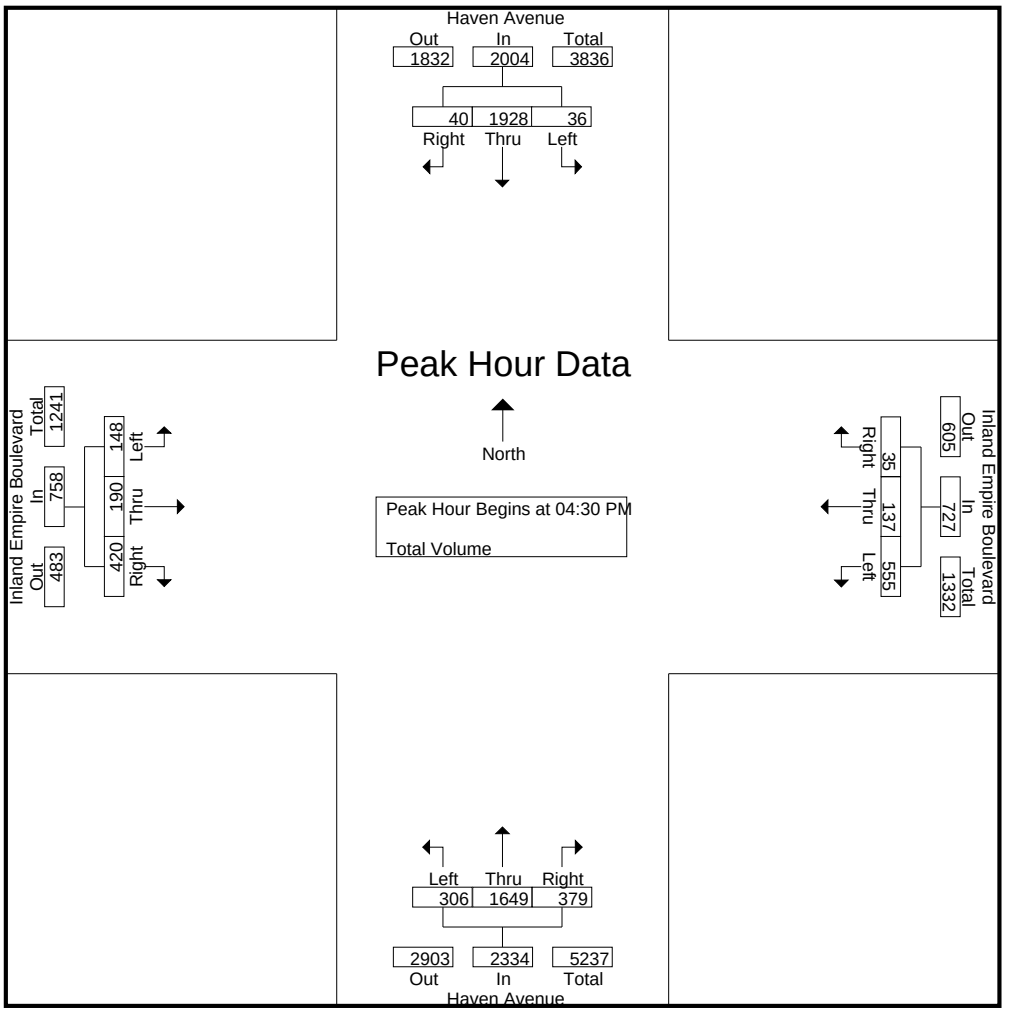

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:45 PM				04:30 PM			
+0 mins.	7	454	**12**	473	130	30	6	166	84	**428**	96	608	30	47	**125**	202
+15 mins.	7	427	12	446	103	32	**12**	147	**90**	417	102	**609**	31	44	100	175
+30 mins.	10	481	7	498	**198**	**41**	7	**246**	61	420	**108**	589	37	**52**	120	**209**
+45 mins.	**12**	**566**	9	**587**	124	34	10	168	73	418	99	590	**50**	47	75	172
Total Volume	36	1928	40	2004	555	137	35	727	308	1683	405	2396	148	190	420	758
% App. Total	1.8	96.2	2		76.3	18.8	4.8		12.9	70.2	16.9		19.5	25.1	55.4	
PHF	.750	.852	.833	.853	.701	.835	.729	.739	.856	.983	.938	.984	.740	.913	.840	.907

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City of Ontario
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E/W: Inland Empire Boulevard/Mall Drive
Weather: Clear

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Groups Printed- Total Volume

	Milliken Avenue Southbound				Mall Drive Westbound				Milliken Avenue Northbound				Inland Empire Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	3	122	14	139	11	7	3	21	63	143	14	220	6	2	5	13	393
07:15 AM	5	196	18	219	7	10	1	18	63	170	13	246	7	2	5	14	497
07:30 AM	6	164	26	196	22	17	5	44	84	232	25	341	4	4	10	18	599
07:45 AM	5	222	37	264	18	17	8	43	103	260	26	389	15	7	12	34	730
Total	19	704	95	818	58	51	17	126	313	805	78	1196	32	15	32	79	2219
08:00 AM	10	140	25	175	19	17	0	36	88	217	20	325	20	11	5	36	572
08:15 AM	7	191	25	223	27	17	4	48	78	205	25	308	16	7	18	41	620
08:30 AM	8	204	19	231	21	21	3	45	80	178	14	272	13	10	15	38	586
08:45 AM	7	189	25	221	9	11	9	29	82	219	35	336	12	9	17	38	624
Total	32	724	94	850	76	66	16	158	328	819	94	1241	61	37	55	153	2402
Grand Total	51	1428	189	1668	134	117	33	284	641	1624	172	2437	93	52	87	232	4621
Apprch %	3.1	85.6	11.3		47.2	41.2	11.6		26.3	66.6	7.1		40.1	22.4	37.5		
Total %	1.1	30.9	4.1	36.1	2.9	2.5	0.7	6.1	13.9	35.1	3.7	52.7	2	1.1	1.9	5	

	Milliken Avenue Southbound				Mall Drive Westbound				Milliken Avenue Northbound				Inland Empire Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	6	164	26	196	22	**17**	5	44	84	232	25	341	4	4	10	18	599
07:45 AM	5	**222**	**37**	**264**	18	17	**8**	43	**103**	**260**	**26**	**389**	15	7	12	34	**730**
08:00 AM	**10**	140	25	175	19	17	0	36	88	217	20	325	**20**	**11**	5	36	572
08:15 AM	7	191	25	223	**27**	17	4	**48**	78	205	25	308	16	7	**18**	**41**	620
Total Volume	28	717	113	858	86	68	17	171	353	914	96	1363	55	29	45	129	2521
% App. Total	3.3	83.6	13.2		50.3	39.8	9.9		25.9	67.1	7		42.6	22.5	34.9		
PHF	.700	.807	.764	.813	.796	1.00	.531	.891	.857	.879	.923	.876	.688	.659	.625	.787	.863

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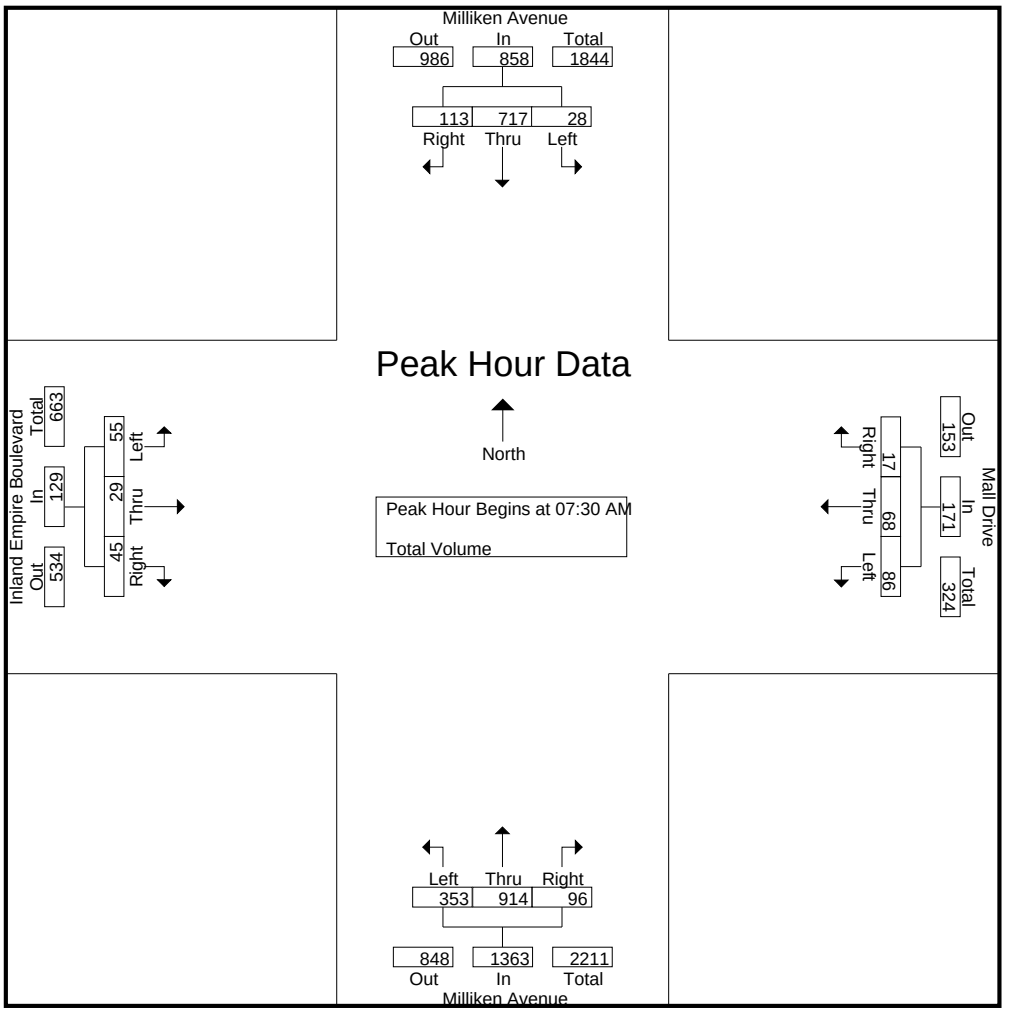
City of Ontario
N/S: Milliken Avenue
E/W: Inland Empire Boulevard/Mall Drive
Weather: Clear

File Name : ONTMIINAM
Site Code : 04216253
Start Date : 7/6/2016
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				07:30 AM				08:00 AM			
+0 mins.	5	**222**	**37**	**264**	18	17	**8**	43	84	232	25	341	**20**	**11**	5	36
+15 mins.	**10**	140	25	175	19	17	0	36	**103**	**260**	**26**	**389**	16	7	**18**	**41**
+30 mins.	7	191	25	223	**27**	17	4	**48**	88	217	20	325	13	10	15	38
+45 mins.	8	204	19	231	21	**21**	3	45	78	205	25	308	12	9	17	38
Total Volume	30	757	106	893	85	72	15	172	353	914	96	1363	61	37	55	153
% App. Total	3.4	84.8	11.9		49.4	41.9	8.7		25.9	67.1	7		39.9	24.2	35.9	
PHF	.750	.852	.716	.846	.787	.857	.469	.896	.857	.879	.923	.876	.763	.841	.764	.933

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City of Ontario
N/S: Milliken Avenue
E/W: Inland Empire Boulevard/Mall Drive
Weather: Clear

File Name : ONTMIINPM
Site Code : 04216253
Start Date : 7/6/2016
Page No : 1

Groups Printed- Total Volume

	Milliken Avenue Southbound				Mall Drive Westbound				Milliken Avenue Northbound				Inland Empire Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	23	294	17	334	42	22	17	81	53	304	76	433	59	48	55	162	1010
04:15 PM	23	248	16	287	48	19	19	86	77	247	62	386	48	45	48	141	900
04:30 PM	22	295	24	341	45	20	15	80	70	286	71	427	48	49	66	163	1011
04:45 PM	24	308	29	361	58	18	15	91	79	334	82	495	62	53	49	164	1111
Total	92	1145	86	1323	193	79	66	338	279	1171	291	1741	217	195	218	630	4032
05:00 PM	21	314	24	359	43	17	29	89	74	297	86	457	66	67	83	216	1121
05:15 PM	21	304	18	343	49	16	14	79	103	380	73	556	82	57	89	228	1206
05:30 PM	18	297	32	347	35	17	17	69	85	373	77	535	46	73	60	179	1130
05:45 PM	26	216	27	269	52	15	13	80	99	296	85	480	50	61	68	179	1008
Total	86	1131	101	1318	179	65	73	317	361	1346	321	2028	244	258	300	802	4465
Grand Total	178	2276	187	2641	372	144	139	655	640	2517	612	3769	461	453	518	1432	8497
Apprch %	6.7	86.2	7.1		56.8	22	21.2		17	66.8	16.2		32.2	31.6	36.2		
Total %	2.1	26.8	2.2	31.1	4.4	1.7	1.6	7.7	7.5	29.6	7.2	44.4	5.4	5.3	6.1	16.9	

	Milliken Avenue Southbound				Mall Drive Westbound				Milliken Avenue Northbound				Inland Empire Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**24**	308	29	**361**	**58**	**18**	15	**91**	79	334	82	495	62	53	49	164	1111
05:00 PM	21	**314**	24	359	43	17	**29**	89	74	297	**86**	457	66	67	83	216	1121
05:15 PM	21	304	18	343	49	16	14	79	**103**	**380**	73	**556**	**82**	57	**89**	**228**	**1206**
05:30 PM	18	297	**32**	347	35	17	17	69	85	373	77	535	46	**73**	60	179	1130
Total Volume	84	1223	103	1410	185	68	75	328	341	1384	318	2043	256	250	281	787	4568
% App. Total	6	86.7	7.3		56.4	20.7	22.9		16.7	67.7	15.6		32.5	31.8	35.7		
PHF	.875	.974	.805	.976	.797	.944	.647	.901	.828	.911	.924	.919	.780	.856	.789	.863	.947

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City of Ontario
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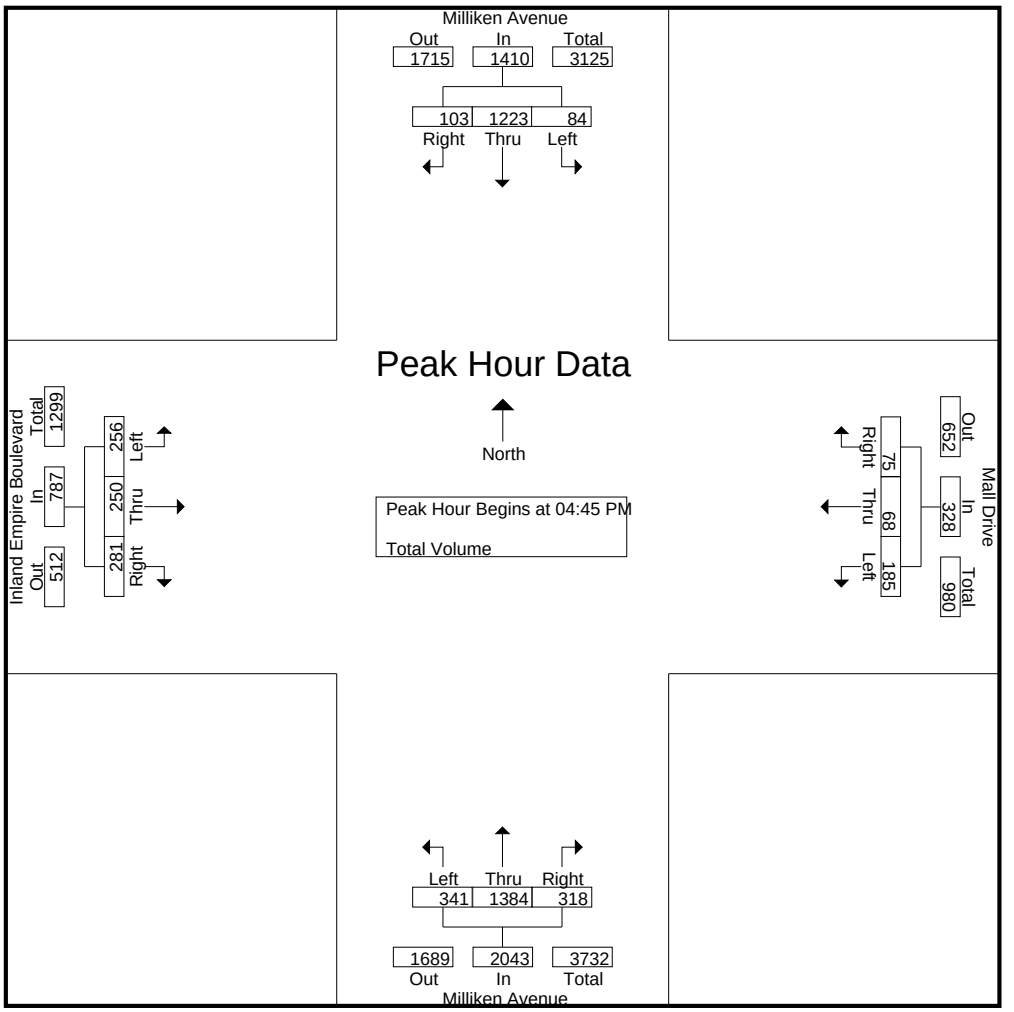
E/W: Inland Empire Boulevard/Mall Drive
Weather: Clear

File Name : ONTMIINPM
Site Code : 04216253
Start Date : 7/6/2016
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:15 PM				04:45 PM				05:00 PM			
+0 mins.	**24**	308	29	**361**	48	19	19	86	79	334	82	495	66	67	83	216
+15 mins.	21	**314**	24	359	45	**20**	15	80	74	297	**86**	457	**82**	57	**89**	**228**
+30 mins.	21	304	18	343	**58**	18	15	**91**	**103**	**380**	73	**556**	46	**73**	60	179
+45 mins.	18	297	**32**	347	43	17	**29**	89	85	373	77	535	50	61	68	179
Total Volume	84	1223	103	1410	194	74	78	346	341	1384	318	2043	244	258	300	802
% App. Total	6	86.7	7.3		56.1	21.4	22.5		16.7	67.7	15.6		30.4	32.2	37.4	
PHF	.875	.974	.805	.976	.836	.925	.672	.951	.828	.911	.924	.919	.744	.884	.843	.879

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City of Ontario
N/S: Haven Avenue
E/W: I-10 Westbound Ramps
Weather: Clear

File Name : 06_ONT_Haven_10W AM
Site Code : 99919684
Start Date : 11/6/2019
Page No : 1

Groups Printed- Total Volume

	Haven Avenue Southbound				I-10 Westbound Ramps Westbound				Haven Avenue Northbound				I-10 Westbound On Ramp Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
06:00 AM	0	197	77	274	94	0	75	169	0	158	66	224	0	0	0	0	667
06:15 AM	0	241	83	324	103	0	73	176	0	224	77	301	0	0	0	0	801
06:30 AM	0	263	87	350	118	0	95	213	0	275	65	340	0	0	0	0	903
06:45 AM	0	318	115	433	94	0	96	190	0	400	81	481	0	0	0	0	1104
Total	0	1019	362	1381	409	0	339	748	0	1057	289	1346	0	0	0	0	3475
07:00 AM	0	312	120	432	86	0	81	167	0	392	83	475	0	0	0	0	1074
07:15 AM	0	331	122	453	97	0	92	189	0	484	98	582	0	0	0	0	1224
07:30 AM	0	357	110	467	94	0	102	196	0	623	72	695	0	0	0	0	1358
07:45 AM	0	403	75	478	132	0	179	311	0	680	71	751	0	0	0	0	1540
Total	0	1403	427	1830	409	0	454	863	0	2179	324	2503	0	0	0	0	5196
08:00 AM	0	330	91	421	114	0	181	295	0	550	60	610	0	0	0	0	1326
08:15 AM	0	331	95	426	118	0	166	284	0	553	89	642	0	0	0	0	1352
08:30 AM	0	301	98	399	116	0	172	288	0	515	59	574	0	0	0	0	1261
08:45 AM	0	270	101	371	107	0	168	275	0	524	69	593	0	0	0	0	1239
Total	0	1232	385	1617	455	0	687	1142	0	2142	277	2419	0	0	0	0	5178
Grand Total	0	3654	1174	4828	1273	0	1480	2753	0	5378	890	6268	0	0	0	0	13849
Apprch %	0	75.7	24.3		46.2	0	53.8		0	85.8	14.2		0	0	0		
Total %	0	26.4	8.5	34.9	9.2	0	10.7	19.9	0	38.8	6.4	45.3	0	0	0	0	

	Haven Avenue Southbound				I-10 Westbound Ramps Westbound				Haven Avenue Northbound				I-10 Westbound On Ramp Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	357	**110**	467	94	0	102	196	0	623	72	695	0	0	0	0	1358
07:45 AM	0	**403**	75	**478**	**132**	0	179	**311**	0	**680**	71	**751**	0	0	0	0	**1540**
08:00 AM	0	330	91	421	114	0	**181**	295	0	550	60	610	0	0	0	0	1326
08:15 AM	0	331	95	426	118	0	166	284	0	553	**89**	642	0	0	0	0	1352
Total Volume	0	1421	371	1792	458	0	628	1086	0	2406	292	2698	0	0	0	0	5576
% App. Total	0	79.3	20.7		42.2	0	57.8		0	89.2	10.8		0	0	0		
PHF	.000	.882	.843	.937	.867	.000	.867	.873	.000	.885	.820	.898	.000	.000	.000	.000	.905

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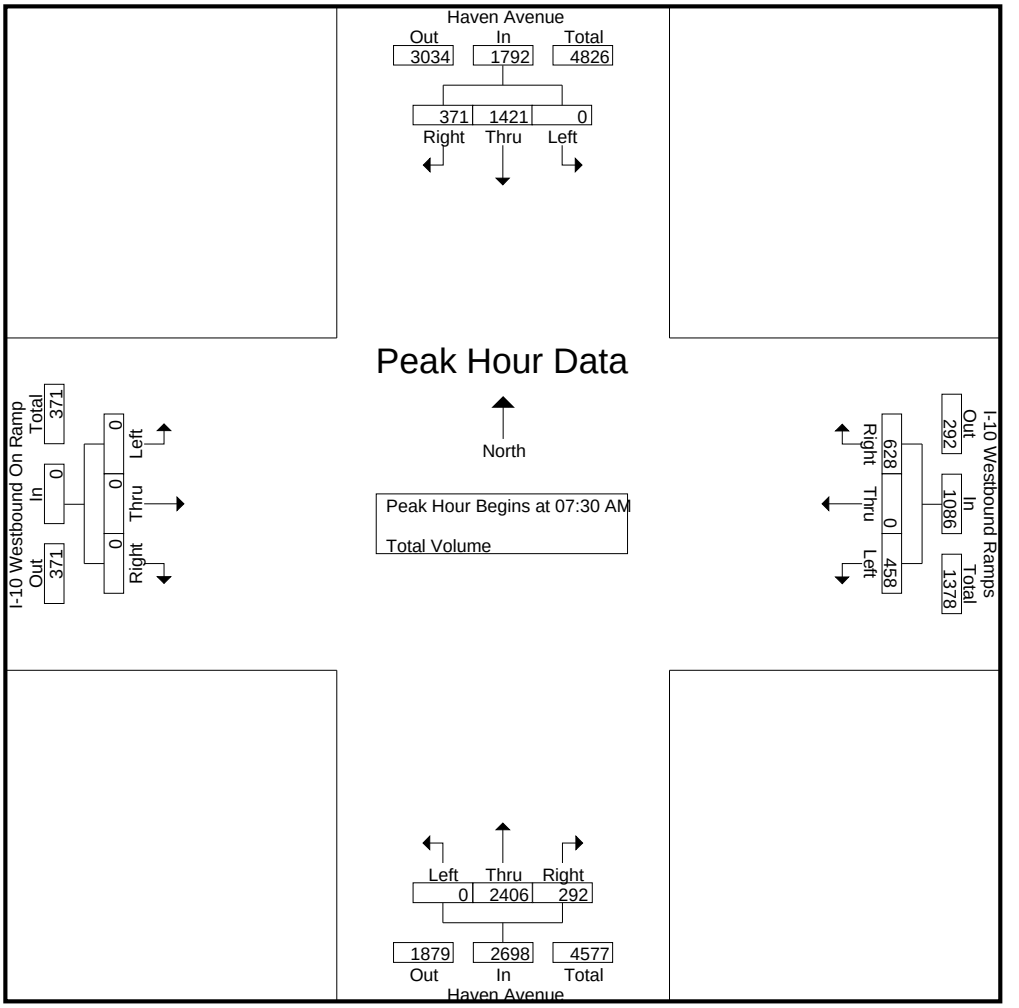
City of Ontario
N/S: Haven Avenue
E/W: I-10 Westbound Ramps
Weather: Clear

File Name : 06_ONT_Haven_10W AM
Site Code : 99919684
Start Date : 11/6/2019
Page No : 2



Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:45 AM				07:30 AM				06:00 AM			
+0 mins.	0	312	120	432	**132**	0	179	**311**	0	623	72	695	0	0	0	0
+15 mins.	0	331	**122**	453	114	0	**181**	295	0	**680**	71	**751**	0	0	0	0
+30 mins.	0	357	110	467	118	0	166	284	0	550	60	610	0	0	0	0
+45 mins.	0	**403**	75	**478**	116	0	172	288	0	553	**89**	642	0	0	0	0
Total Volume	0	1403	427	1830	480	0	698	1178	0	2406	292	2698	0	0	0	0
% App. Total	0	76.7	23.3		40.7	0	59.3		0	89.2	10.8		0	0	0	
PHF	.000	.870	.875	.957	.909	.000	.964	.947	.000	.885	.820	.898	.000	.000	.000	.000

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City of Ontario
N/S: Haven Avenue
E/W: I-10 Westbound Ramps
Weather: Clear

File Name : 06_ONT_Haven_10W PM
Site Code : 99919684
Start Date : 11/6/2019
Page No : 1

Groups Printed- Total Volume

	Haven Avenue Southbound				I-10 Westbound Ramps Westbound				Haven Avenue Northbound				I-10 Westbound On Ramp Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
03:00 PM	0	396	181	577	98	0	98	196	0	406	122	528	0	0	0	0	1301
03:15 PM	0	379	150	529	92	0	130	222	0	449	99	548	0	0	0	0	1299
03:30 PM	0	494	175	669	110	0	120	230	0	462	128	590	0	0	0	0	1489
03:45 PM	0	386	129	515	105	0	127	232	0	527	140	667	0	0	0	0	1414
Total	0	1655	635	2290	405	0	475	880	0	1844	489	2333	0	0	0	0	5503
04:00 PM	0	426	190	616	85	0	130	215	0	530	151	681	0	0	0	0	1512
04:15 PM	0	387	174	561	79	0	119	198	0	494	135	629	0	0	0	0	1388
04:30 PM	0	475	223	698	76	0	123	199	0	418	144	562	0	0	0	0	1459
04:45 PM	0	495	213	708	74	0	114	188	0	541	161	702	0	0	0	0	1598
Total	0	1783	800	2583	314	0	486	800	0	1983	591	2574	0	0	0	0	5957
05:00 PM	0	592	205	797	73	0	112	185	0	528	143	671	0	0	0	0	1653
05:15 PM	0	531	171	702	67	0	111	178	0	577	150	727	0	0	0	0	1607
05:30 PM	0	402	146	548	83	0	120	203	0	534	107	641	0	0	0	0	1392
05:45 PM	0	375	145	520	84	2	146	232	0	486	105	591	0	0	0	0	1343
Total	0	1900	667	2567	307	2	489	798	0	2125	505	2630	0	0	0	0	5995
Grand Total	0	5338	2102	7440	1026	2	1450	2478	0	5952	1585	7537	0	0	0	0	17455
Apprch %	0	71.7	28.3		41.4	0.1	58.5		0	79	21		0	0	0		
Total %	0	30.6	12	42.6	5.9	0	8.3	14.2	0	34.1	9.1	43.2	0	0	0	0	

	Haven Avenue Southbound				I-10 Westbound Ramps Westbound				Haven Avenue Northbound				I-10 Westbound On Ramp Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	475	**223**	698	**76**	0	**123**	**199**	0	418	144	562	0	0	0	0	1459
04:45 PM	0	495	213	708	74	0	114	188	0	541	**161**	702	0	0	0	0	1598
05:00 PM	0	**592**	205	**797**	73	0	112	185	0	528	143	671	0	0	0	0	**1653**
05:15 PM	0	531	171	702	67	0	111	178	0	**577**	150	**727**	0	0	0	0	1607
Total Volume	0	2093	812	2905	290	0	460	750	0	2064	598	2662	0	0	0	0	6317
% App. Total	0	72	28		38.7	0	61.3		0	77.5	22.5		0	0	0		
PHF	.000	.884	.910	.911	.954	.000	.935	.942	.000	.894	.929	.915	.000	.000	.000	.000	.955

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City of Ontario
N/S: Haven Avenue
E/W: I-10 Westbound Ramps
Weather: Clear

File Name : 06_ONT_Haven_10W PM
Site Code : 99919684
Start Date : 11/6/2019
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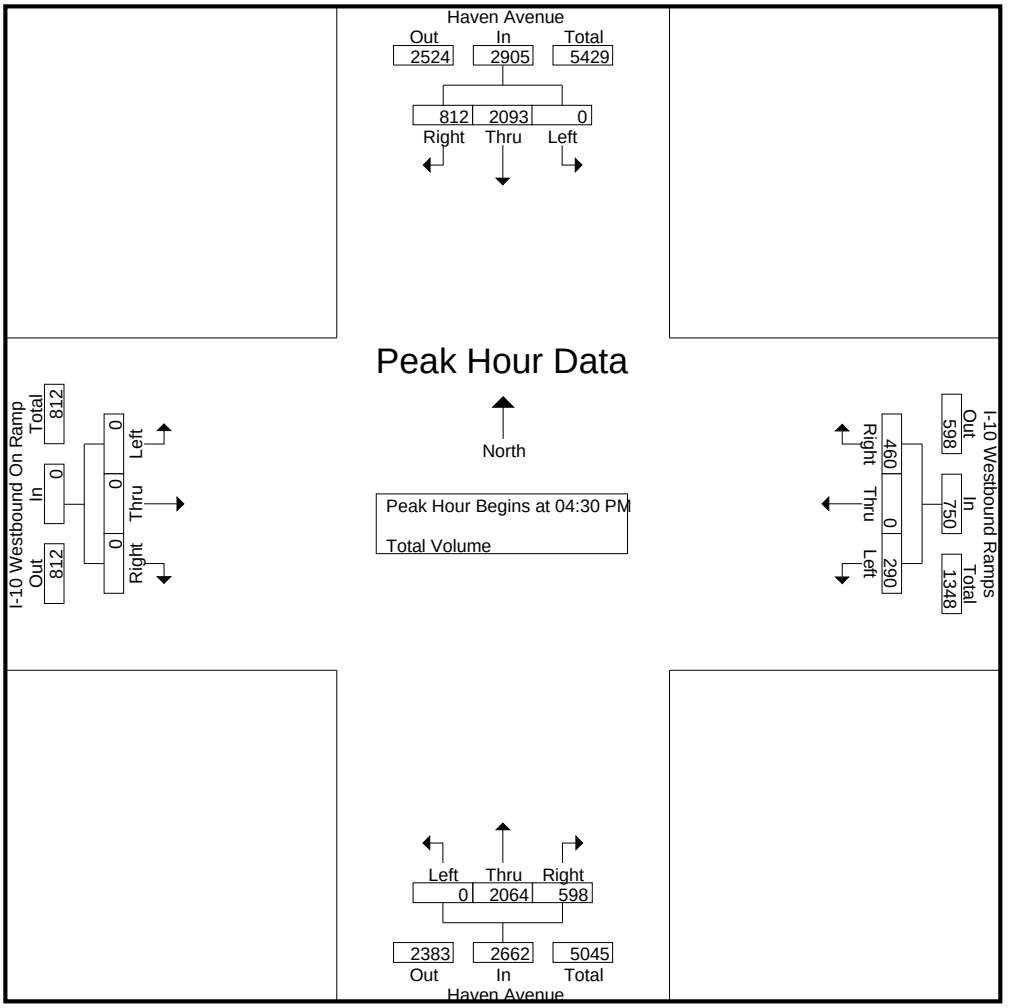

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				03:15 PM				04:45 PM				03:00 PM			
+0 mins.	0	475	**223**	698	92	0	**130**	222	0	541	**161**	702	0	0	0	0
+15 mins.	0	495	213	708	**110**	0	120	230	0	528	143	671	0	0	0	0
+30 mins.	0	**592**	205	**797**	105	0	127	**232**	0	**577**	150	**727**	0	0	0	0
+45 mins.	0	531	171	702	85	0	130	215	0	534	107	641	0	0	0	0
Total Volume	0	2093	812	2905	392	0	507	899	0	2180	561	2741	0	0	0	0
% App. Total	0	72	28		43.6	0	56.4		0	79.5	20.5		0	0	0	
PHF	.000	.884	.910	.911	.891	.000	.975	.969	.000	.945	.871	.943	.000	.000	.000	.000

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File Name : 08_ONT_Milliken_10W AM
Site Code : 99919684
Start Date : 11/6/2019
Page No : 1

City of Ontario
N/S: Milliken Avenue
E/W: I-10 WB Ramps/Ontario Mills Pkwy
Weather: Clear

Groups Printed- Total Volume

	Milliken Avenue Southbound				Ontario Mills Parkway Westbound				Milliken Avenue Northbound				I-10 Westbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
06:00 AM	5	86	46	137	12	19	3	34	24	84	28	136	55	11	48	114	421
06:15 AM	3	107	65	175	25	33	8	66	28	96	37	161	44	10	54	108	510
06:30 AM	10	114	63	187	19	51	5	75	32	118	45	195	55	8	69	132	589
06:45 AM	13	140	56	209	43	63	5	111	26	121	59	206	89	21	51	161	687
Total	31	447	230	708	99	166	21	286	110	419	169	698	243	50	222	515	2207
07:00 AM	19	115	69	203	35	81	4	120	28	131	52	211	69	13	32	114	648
07:15 AM	15	120	62	197	29	88	5	122	28	168	57	253	101	18	37	156	728
07:30 AM	16	124	59	199	39	74	5	118	26	212	75	313	91	23	47	161	791
07:45 AM	20	146	51	217	48	51	11	110	39	224	95	358	151	24	59	234	919
Total	70	505	241	816	151	294	25	470	121	735	279	1135	412	78	175	665	3086
08:00 AM	12	102	61	175	34	30	13	77	41	215	64	320	143	23	55	221	793
08:15 AM	29	133	63	225	29	16	3	48	36	175	44	255	157	13	58	228	756
08:30 AM	20	104	54	178	36	28	6	70	32	193	49	274	92	14	45	151	673
08:45 AM	21	122	64	207	26	26	7	59	31	171	50	252	122	33	56	211	729
Total	82	461	242	785	125	100	29	254	140	754	207	1101	514	83	214	811	2951
Grand Total	183	1413	713	2309	375	560	75	1010	371	1908	655	2934	1169	211	611	1991	8244
Apprch %	7.9	61.2	30.9		37.1	55.4	7.4		12.6	65	22.3		58.7	10.6	30.7		
Total %	2.2	17.1	8.6	28	4.5	6.8	0.9	12.3	4.5	23.1	7.9	35.6	14.2	2.6	7.4	24.2	

	Milliken Avenue Southbound				Ontario Mills Parkway Westbound				Milliken Avenue Northbound				I-10 Westbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	16	124	59	199	39	**74**	5	**118**	26	212	75	313	91	23	47	161	791
07:45 AM	20	**146**	51	217	**48**	51	11	110	39	**224**	**95**	**358**	151	**24**	**59**	**234**	**919**
08:00 AM	12	102	61	175	34	30	**13**	77	**41**	215	64	320	143	23	55	221	793
08:15 AM	**29**	133	**63**	**225**	29	16	3	48	36	175	44	255	**157**	13	58	228	756
Total Volume	77	505	234	816	150	171	32	353	142	826	278	1246	542	83	219	844	3259
% App. Total	9.4	61.9	28.7		42.5	48.4	9.1		11.4	66.3	22.3		64.2	9.8	25.9		
PHF	.664	.865	.929	.907	.781	.578	.615	.748	.866	.922	.732	.870	.863	.865	.928	.902	.887

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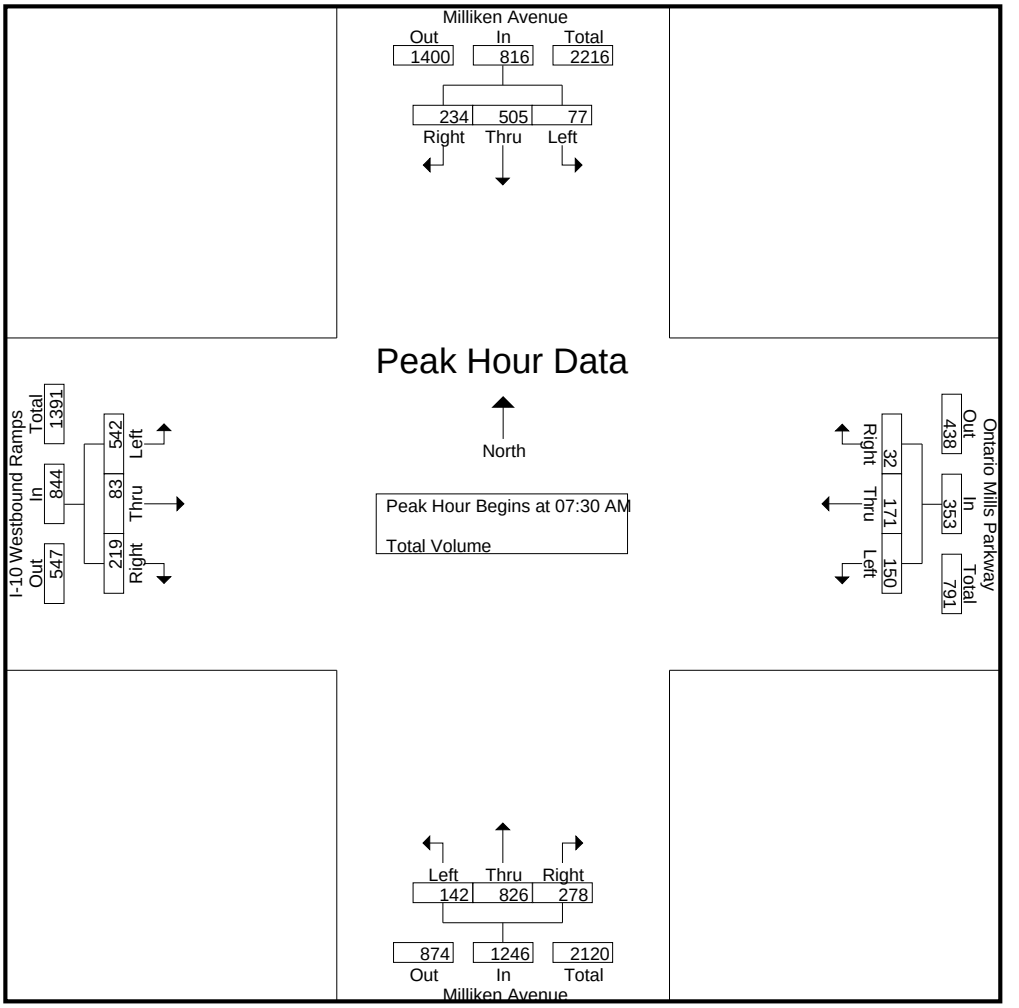
City of Ontario
N/S: Milliken Avenue
E/W: I-10 WB Ramps/Ontario Mills Pkwy
Weather: Clear

File Name : 08_ONT_Milliken_10W AM
Site Code : 99919684
Start Date : 11/6/2019



Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				06:45 AM				07:30 AM				07:30 AM			
+0 mins.	19	115	**69**	203	**43**	63	**5**	111	26	212	75	313	91	23	47	161
+15 mins.	15	120	62	197	35	81	4	120	39	**224**	**95**	**358**	151	**24**	**59**	**234**
+30 mins.	16	124	59	199	29	**88**	5	**122**	**41**	215	64	320	143	23	55	221
+45 mins.	**20**	**146**	51	**217**	39	74	5	118	36	175	44	255	**157**	13	58	228
Total Volume	70	505	241	816	146	306	19	471	142	826	278	1246	542	83	219	844
% App. Total	8.6	61.9	29.5		31	65	4		11.4	66.3	22.3		64.2	9.8	25.9	
PHF	.875	.865	.873	.940	.849	.869	.950	.965	.866	.922	.732	.870	.863	.865	.928	.902

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City of Ontario
N/S: Milliken Avenue
E/W: I-10 WB Ramps/Ontario Mills Pkwy
Weather: Clear

File Name : 08_ONT_Milliken_10W PM
Site Code : 99919684
Start Date : 11/6/2019

Groups Printed- Total Volume

	Milliken Avenue Southbound				Ontario Mills Parkway Westbound				Milliken Avenue Northbound				I-10 Westbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
03:00 PM	43	197	97	337	41	74	13	128	65	229	92	386	119	31	59	209	1060
03:15 PM	40	202	119	361	53	36	8	97	44	233	77	354	139	38	39	216	1028
03:30 PM	65	177	85	327	39	47	18	104	73	225	82	380	137	33	57	227	1038
03:45 PM	53	195	110	358	50	54	10	114	42	251	95	388	186	43	50	279	1139
Total	201	771	411	1383	183	211	49	443	224	938	346	1508	581	145	205	931	4265
04:00 PM	63	195	120	378	39	58	12	109	64	223	105	392	150	39	43	232	1111
04:15 PM	36	231	101	368	51	49	14	114	51	253	94	398	166	49	48	263	1143
04:30 PM	63	213	121	397	54	72	9	135	72	246	98	416	163	57	49	269	1217
04:45 PM	57	238	106	401	50	73	14	137	46	233	108	387	215	47	57	319	1244
Total	219	877	448	1544	194	252	49	495	233	955	405	1593	694	192	197	1083	4715
05:00 PM	111	252	100	463	67	76	18	161	57	242	106	405	168	37	67	272	1301
05:15 PM	76	288	115	479	63	57	18	138	47	221	106	374	170	41	46	257	1248
05:30 PM	66	225	103	394	49	57	17	123	50	241	99	390	177	42	65	284	1191
05:45 PM	75	216	103	394	53	58	17	128	30	236	89	355	188	42	50	280	1157
Total	328	981	421	1730	232	248	70	550	184	940	400	1524	703	162	228	1093	4897
Grand Total	748	2629	1280	4657	609	711	168	1488	641	2833	1151	4625	1978	499	630	3107	13877
Apprch %	16.1	56.5	27.5		40.9	47.8	11.3		13.9	61.3	24.9		63.7	16.1	20.3		
Total %	5.4	18.9	9.2	33.6	4.4	5.1	1.2	10.7	4.6	20.4	8.3	33.3	14.3	3.6	4.5	22.4	

	Milliken Avenue Southbound				Ontario Mills Parkway Westbound				Milliken Avenue Northbound				I-10 Westbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	63	213	**121**	397	54	72	9	135	**72**	**246**	98	**416**	163	**57**	49	269	1217
04:45 PM	57	238	106	401	50	73	14	137	46	233	**108**	387	**215**	47	57	**319**	1244
05:00 PM	**111**	252	100	463	**67**	**76**	**18**	**161**	57	242	106	405	168	37	**67**	272	**1301**
05:15 PM	76	**288**	115	**479**	63	57	18	138	47	221	106	374	170	41	46	257	1248
Total Volume	307	991	442	1740	234	278	59	571	222	942	418	1582	716	182	219	1117	5010
% App. Total	17.6	57	25.4		41	48.7	10.3		14	59.5	26.4		64.1	16.3	19.6		
PHF	.691	.860	.913	.908	.873	.914	.819	.887	.771	.957	.968	.951	.833	.798	.817	.875	.963

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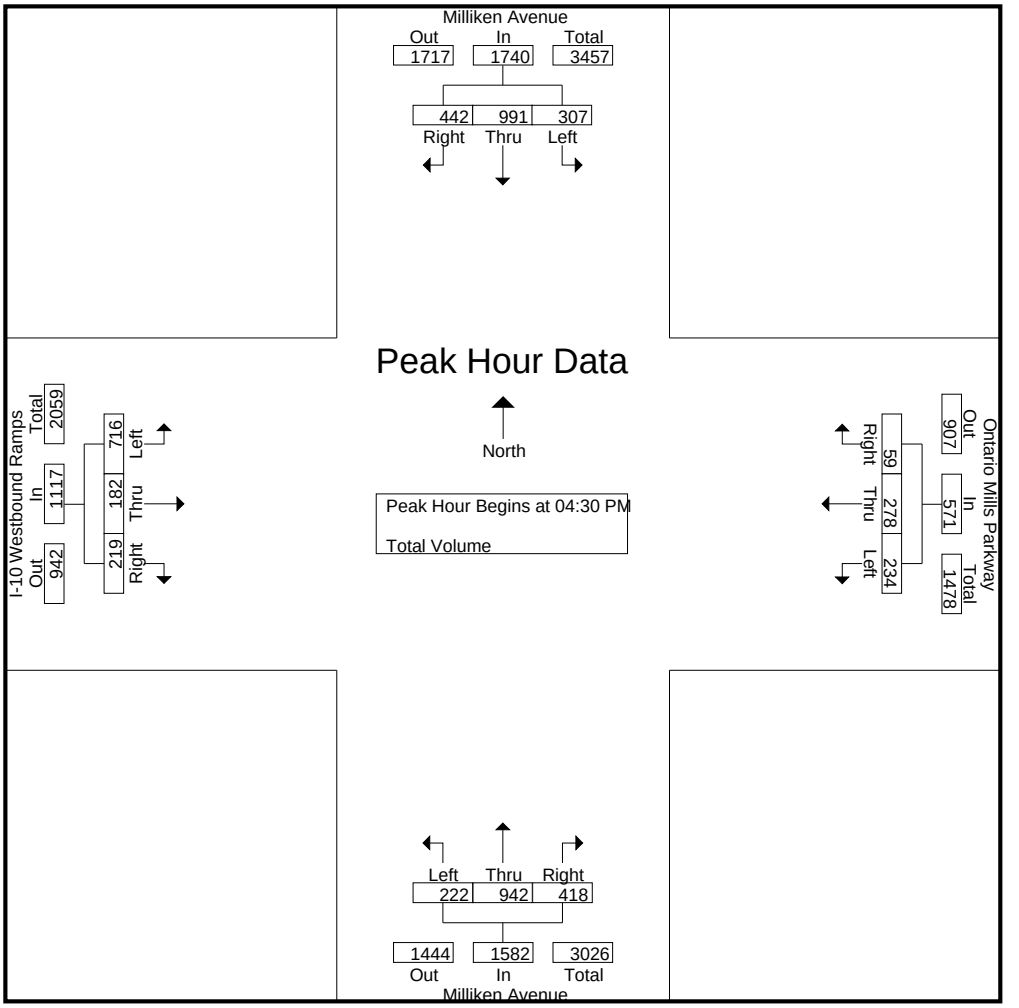
City of Ontario
N/S: Milliken Avenue
E/W: I-10 WB Ramps/Ontario Mills Pkwy
Weather: Clear

File Name : 08_ONT_Milliken_10W PM
Site Code : 99919684
Start Date : 11/6/2019



Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:15 PM				04:45 PM			
+0 mins.	63	213	**121**	397	54	72	9	135	51	**253**	94	398	**215**	**47**	57	**319**
+15 mins.	57	238	106	401	50	73	14	137	**72**	246	98	**416**	168	37	**67**	272
+30 mins.	**111**	252	100	463	**67**	**76**	**18**	**161**	46	233	**108**	387	170	41	46	257
+45 mins.	76	**288**	115	**479**	63	57	18	138	57	242	106	405	177	42	65	284
Total Volume	307	991	442	1740	234	278	59	571	226	974	406	1606	730	167	235	1132
% App. Total	17.6	57	25.4		41	48.7	10.3		14.1	60.6	25.3		64.5	14.8	20.8	
PHF	.691	.860	.913	.908	.873	.914	.819	.887	.785	.962	.940	.965	.849	.888	.877	.887

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City of Upland
N/S: Haven Avenue
E/W: I-10 Eastbound Ramps
Weather: Clear

File Name : 07_ONT_Haven_10E AM
Site Code : 99919684
Start Date : 11/6/2019
Page No : 1

Groups Printed- Total Volume

	Haven Avenue Southbound				I-10 Eastbound On Ramp Westbound				Haven Avenue Northbound				I-10 Eastbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
06:00 AM	0	217	74	291	0	0	0	0	0	152	57	209	66	0	56	122	622
06:15 AM	0	276	69	345	0	0	0	0	0	195	69	264	100	0	92	192	801
06:30 AM	0	271	113	384	0	0	0	0	0	207	70	277	131	0	108	239	900
06:45 AM	0	300	111	411	0	0	0	0	0	290	62	352	198	0	147	345	1108
Total	0	1064	367	1431	0	0	0	0	0	844	258	1102	495	0	403	898	3431
07:00 AM	0	285	116	401	0	0	0	0	0	310	83	393	165	0	141	306	1100
07:15 AM	0	309	115	424	0	0	0	0	0	372	67	439	204	0	134	338	1201
07:30 AM	0	337	109	446	0	0	0	0	0	416	57	473	282	0	144	426	1345
07:45 AM	0	406	125	531	0	0	0	0	0	402	69	471	350	0	163	513	1515
Total	0	1337	465	1802	0	0	0	0	0	1500	276	1776	1001	0	582	1583	5161
08:00 AM	0	336	110	446	0	0	0	0	0	361	78	439	252	0	125	377	1262
08:15 AM	0	331	118	449	0	0	0	0	0	387	80	467	260	0	106	366	1282
08:30 AM	0	303	106	409	0	0	0	0	0	331	104	435	243	0	119	362	1206
08:45 AM	0	278	97	375	0	0	0	0	0	344	82	426	244	0	112	356	1157
Total	0	1248	431	1679	0	0	0	0	0	1423	344	1767	999	0	462	1461	4907
Grand Total	0	3649	1263	4912	0	0	0	0	0	3767	878	4645	2495	0	1447	3942	13499
Apprch %	0	74.3	25.7		0	0	0		0	81.1	18.9		63.3	0	36.7		
Total %	0	27	9.4	36.4	0	0	0	0	0	27.9	6.5	34.4	18.5	0	10.7	29.2	

	Haven Avenue Southbound				I-10 Eastbound On Ramp Westbound				Haven Avenue Northbound				I-10 Eastbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	337	109	446	0	0	0	0	0	**416**	57	**473**	282	0	144	426	1345
07:45 AM	0	**406**	**125**	**531**	0	0	0	0	0	402	69	471	**350**	0	**163**	**513**	**1515**
08:00 AM	0	336	110	446	0	0	0	0	0	361	78	439	252	0	125	377	1262
08:15 AM	0	331	118	449	0	0	0	0	0	387	**80**	467	260	0	106	366	1282
Total Volume	0	1410	462	1872	0	0	0	0	0	1566	284	1850	1144	0	538	1682	5404
% App. Total	0	75.3	24.7		0	0	0		0	84.6	15.4		68	0	32		
PHF	.000	.868	.924	.881	.000	.000	.000	.000	.000	.941	.888	.978	.817	.000	.825	.820	.892

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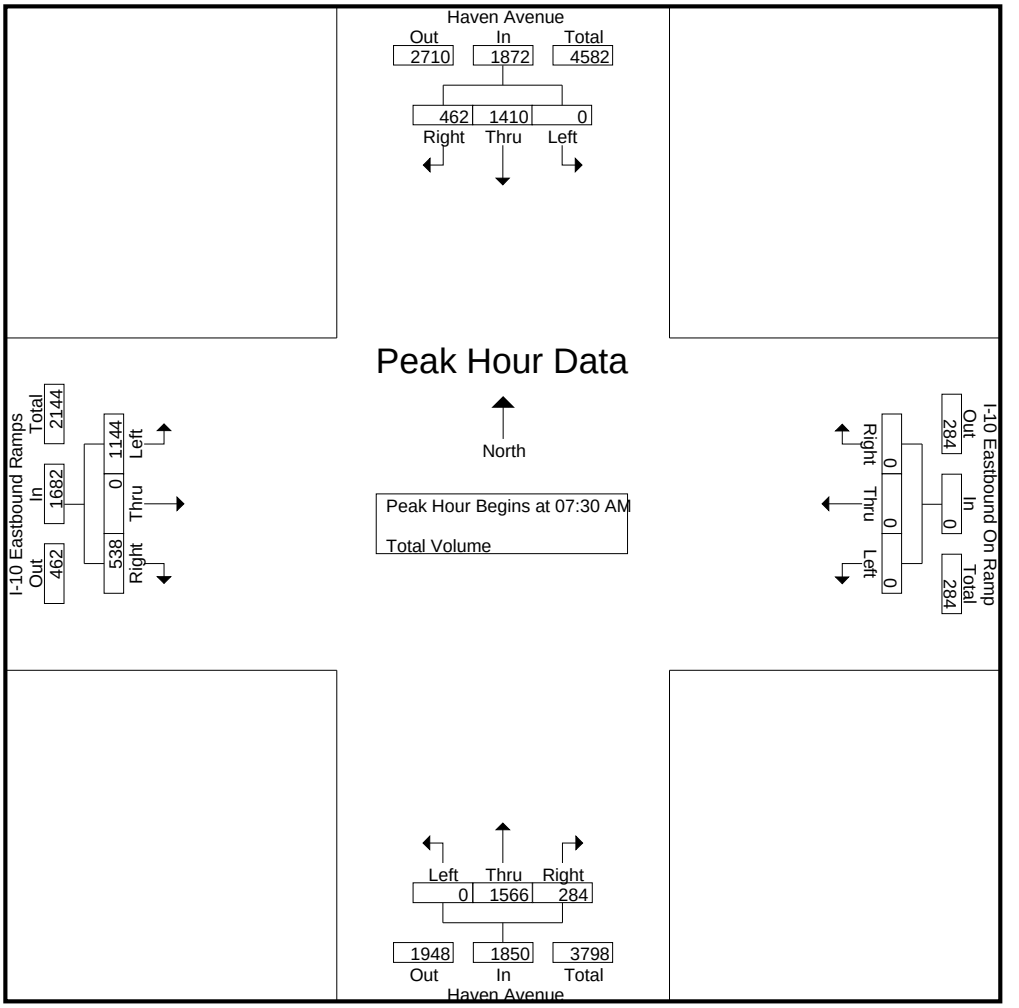
City of Upland
N/S: Haven Avenue
E/W: I-10 Eastbound Ramps
Weather: Clear

File Name : 07_ONT_Haven_10E AM
Site Code : 99919684
Start Date : 11/6/2019
Page No : 2



Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				06:00 AM				07:30 AM				07:30 AM			
+0 mins.	0	337	109	446	0	0	0	0	0	**416**	57	**473**	282	0	144	426
+15 mins.	0	**406**	**125**	**531**	0	0	0	0	0	402	69	471	**350**	0	**163**	**513**
+30 mins.	0	336	110	446	0	0	0	0	0	361	78	439	252	0	125	377
+45 mins.	0	331	118	449	0	0	0	0	0	387	**80**	467	260	0	106	366
Total Volume	0	1410	462	1872	0	0	0	0	0	1566	284	1850	1144	0	538	1682
% App. Total	0	75.3	24.7		0	0	0		0	84.6	15.4		68	0	32	
PHF	.000	.868	.924	.881	.000	.000	.000	.000	.000	.941	.888	.978	.817	.000	.825	.820

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City of Upland
N/S: Haven Avenue
E/W: I-10 Eastbound Ramps
Weather: Clear

File Name : 07_ONT_Haven_10E PM
Site Code : 99919684
Start Date : 11/6/2019
Page No : 1

Groups Printed- Total Volume

	Haven Avenue Southbound				I-10 Eastbound On Ramp Westbound				Haven Avenue Northbound				I-10 Eastbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
03:00 PM	0	384	108	492	0	0	0	0	0	400	170	570	123	0	73	196	1258
03:15 PM	0	350	129	479	0	0	0	0	0	410	214	624	141	0	86	227	1330
03:30 PM	0	403	199	602	0	0	0	0	0	441	193	634	155	0	77	232	1468
03:45 PM	0	372	121	493	0	0	0	0	0	527	194	721	132	0	69	201	1415
Total	0	1509	557	2066	0	0	0	0	0	1778	771	2549	551	0	305	856	5471
04:00 PM	0	380	126	506	0	0	0	0	0	548	160	708	135	0	55	190	1404
04:15 PM	0	341	117	458	0	0	0	0	0	535	195	730	95	0	49	144	1332
04:30 PM	0	422	129	551	0	0	0	0	0	474	152	626	82	0	44	126	1303
04:45 PM	0	432	137	569	0	0	0	0	0	589	202	791	116	0	76	192	1552
Total	0	1575	509	2084	0	0	0	0	0	2146	709	2855	428	0	224	652	5591
05:00 PM	0	501	163	664	0	0	0	0	0	555	182	737	116	0	56	172	1573
05:15 PM	0	456	145	601	0	0	0	0	0	614	188	802	117	0	44	161	1564
05:30 PM	0	366	123	489	0	0	0	0	0	519	159	678	117	0	52	169	1336
05:45 PM	0	368	85	453	0	0	0	0	0	484	140	624	107	0	46	153	1230
Total	0	1691	516	2207	0	0	0	0	0	2172	669	2841	457	0	198	655	5703
Grand Total	0	4775	1582	6357	0	0	0	0	0	6096	2149	8245	1436	0	727	2163	16765
Apprch %	0	75.1	24.9		0	0	0		0	73.9	26.1		66.4	0	33.6		
Total %	0	28.5	9.4	37.9	0	0	0	0	0	36.4	12.8	49.2	8.6	0	4.3	12.9	

	Haven Avenue Southbound				I-10 Eastbound On Ramp Westbound				Haven Avenue Northbound				I-10 Eastbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	432	137	569	0	0	0	0	0	589	**202**	791	116	0	**76**	**192**	1552
05:00 PM	0	**501**	**163**	**664**	0	0	0	0	0	555	182	737	116	0	56	172	**1573**
05:15 PM	0	456	145	601	0	0	0	0	0	**614**	188	**802**	**117**	0	44	161	1564
05:30 PM	0	366	123	489	0	0	0	0	0	519	159	678	117	0	52	169	1336
Total Volume	0	1755	568	2323	0	0	0	0	0	2277	731	3008	466	0	228	694	6025
% App. Total	0	75.5	24.5		0	0	0		0	75.7	24.3		67.1	0	32.9		
PHF	.000	.876	.871	.875	.000	.000	.000	.000	.000	.927	.905	.938	.996	.000	.750	.904	.958

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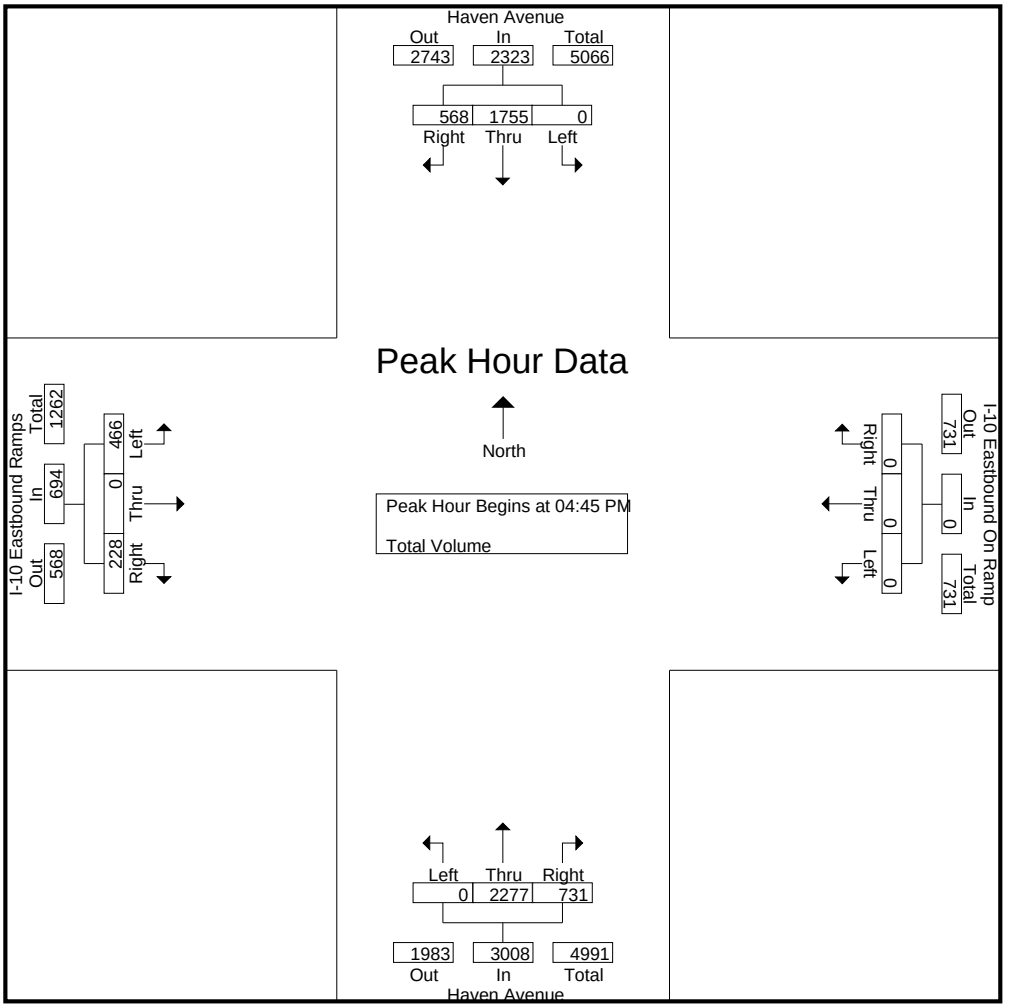
City of Upland
N/S: Haven Avenue
E/W: I-10 Eastbound Ramps
Weather: Clear

File Name : 07_ONT_Haven_10E PM
Site Code : 99919684
Start Date : 11/6/2019
Page No : 2



Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				03:00 PM				04:45 PM				03:00 PM			
+0 mins.	0	422	129	551	0	0	0	0	0	589	**202**	791	123	0	73	196
+15 mins.	0	432	137	569	0	0	0	0	0	555	182	737	141	0	**86**	227
+30 mins.	0	**501**	**163**	**664**	0	0	0	0	0	**614**	188	**802**	**155**	0	77	**232**
+45 mins.	0	456	145	601	0	0	0	0	0	519	159	678	132	0	69	201
Total Volume	0	1811	574	2385	0	0	0	0	0	2277	731	3008	551	0	305	856
% App. Total	0	75.9	24.1		0	0	0		0	75.7	24.3		64.4	0	35.6	
PHF	.000	.904	.880	.898	.000	.000	.000	.000	.000	.927	.905	.938	.889	.000	.887	.922

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City of Ontario
N/S: Milliken Avenue
E/W: I-10 Eastbound Ramps
Weather: Clear

File Name : 09_ONT_Milliken_10E AM
Site Code : 99919684
Start Date : 11/6/2019
Page No : 1

Groups Printed- Total Volume

	Milliken Avenue Southbound			Milliken Avenue Northbound			I-10 Eastbound Ramps Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
06:00 AM	111	32	143	29	83	112	43	66	109	364
06:15 AM	142	40	182	25	78	103	90	70	160	445
06:30 AM	169	42	211	33	99	132	88	108	196	539
06:45 AM	172	68	240	28	97	125	116	163	279	644
Total	594	182	776	115	357	472	337	407	744	1992
07:00 AM	138	51	189	39	103	142	112	110	222	553
07:15 AM	126	53	179	41	135	176	130	122	252	607
07:30 AM	162	53	215	36	159	195	151	121	272	682
07:45 AM	189	61	250	39	168	207	198	157	355	812
Total	615	218	833	155	565	720	591	510	1101	2654
08:00 AM	149	46	195	47	173	220	136	126	262	677
08:15 AM	172	52	224	25	145	170	120	138	258	652
08:30 AM	132	61	193	52	142	194	115	109	224	611
08:45 AM	150	62	212	31	128	159	126	98	224	595
Total	603	221	824	155	588	743	497	471	968	2535
Grand Total	1812	621	2433	425	1510	1935	1425	1388	2813	7181
Apprch %	74.5	25.5		22	78		50.7	49.3		
Total %	25.2	8.6	33.9	5.9	21	26.9	19.8	19.3	39.2	

	Milliken Avenue Southbound			Milliken Avenue Northbound			I-10 Eastbound Ramps Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	162	53	215	36	159	195	151	121	272	682
07:45 AM	**189**	**61**	**250**	39	168	207	**198**	**157**	**355**	**812**
08:00 AM	149	46	195	**47**	**173**	**220**	136	126	262	677
08:15 AM	172	52	224	25	145	170	120	138	258	652
Total Volume	672	212	884	147	645	792	605	542	1147	2823
% App. Total	76	24		18.6	81.4		52.7	47.3		
PHF	.889	.869	.884	.782	.932	.900	.764	.863	.808	.869

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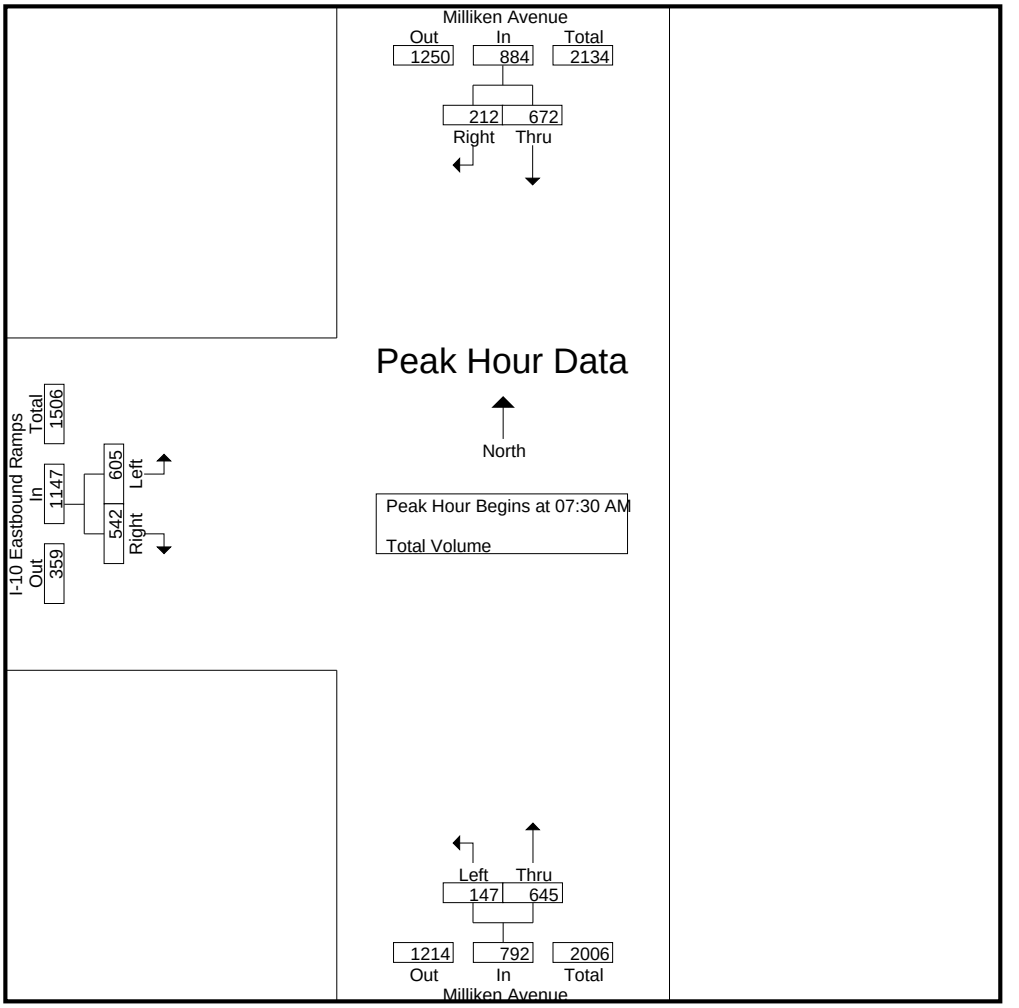
City of Ontario
N/S: Milliken Avenue
E/W: I-10 Eastbound Ramps
Weather: Clear

File Name : 09_ONT_Milliken_10E AM
Site Code : 99919684
Start Date : 11/6/2019
Page No : 2



Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM			07:15 AM			07:30 AM		
+0 mins.	162	53	215	41	135	176	151	121	272
+15 mins.	**189**	**61**	**250**	36	159	195	**198**	**157**	**355**
+30 mins.	149	46	195	39	168	207	136	126	262
+45 mins.	172	52	224	**47**	**173**	**220**	120	138	258
Total Volume	672	212	884	163	635	798	605	542	1147
% App. Total	76	24		20.4	79.6		52.7	47.3	
PHF	.889	.869	.884	.867	.918	.907	.764	.863	.808

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City of Ontario
N/S: Milliken Avenue
E/W: I-10 Eastbound Ramps
Weather: Clear

File Name : 09_ONT_Milliken_10E PM
Site Code : 99919684
Start Date : 11/6/2019
Page No : 1

Groups Printed- Total Volume

	Milliken Avenue Southbound			Milliken Avenue Northbound			I-10 Eastbound Ramps Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
03:00 PM	179	131	310	72	261	333	134	54	188	831
03:15 PM	168	121	289	65	187	252	153	52	205	746
03:30 PM	162	121	283	93	284	377	106	53	159	819
03:45 PM	174	110	284	71	270	341	121	42	163	788
Total	683	483	1166	301	1002	1303	514	201	715	3184
04:00 PM	186	101	287	80	277	357	104	34	138	782
04:15 PM	214	118	332	65	294	359	117	38	155	846
04:30 PM	217	109	326	94	310	404	120	50	170	900
04:45 PM	225	120	345	70	262	332	125	58	183	860
Total	842	448	1290	309	1143	1452	466	180	646	3388
05:00 PM	256	130	386	81	294	375	116	38	154	915
05:15 PM	242	160	402	56	248	304	113	40	153	859
05:30 PM	237	103	340	56	294	350	87	37	124	814
05:45 PM	218	108	326	42	229	271	134	42	176	773
Total	953	501	1454	235	1065	1300	450	157	607	3361
Grand Total	2478	1432	3910	845	3210	4055	1430	538	1968	9933
Apprch %	63.4	36.6		20.8	79.2		72.7	27.3		
Total %	24.9	14.4	39.4	8.5	32.3	40.8	14.4	5.4	19.8	

	Milliken Avenue Southbound			Milliken Avenue Northbound			I-10 Eastbound Ramps Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	217	109	326	**94**	**310**	**404**	120	50	170	900
04:45 PM	225	120	345	70	262	332	**125**	**58**	**183**	860
05:00 PM	**256**	130	386	81	294	375	116	38	154	**915**
05:15 PM	242	**160**	**402**	56	248	304	113	40	153	859
Total Volume	940	519	1459	301	1114	1415	474	186	660	3534
% App. Total	64.4	35.6		21.3	78.7		71.8	28.2		
PHF	.918	.811	.907	.801	.898	.876	.948	.802	.902	.966

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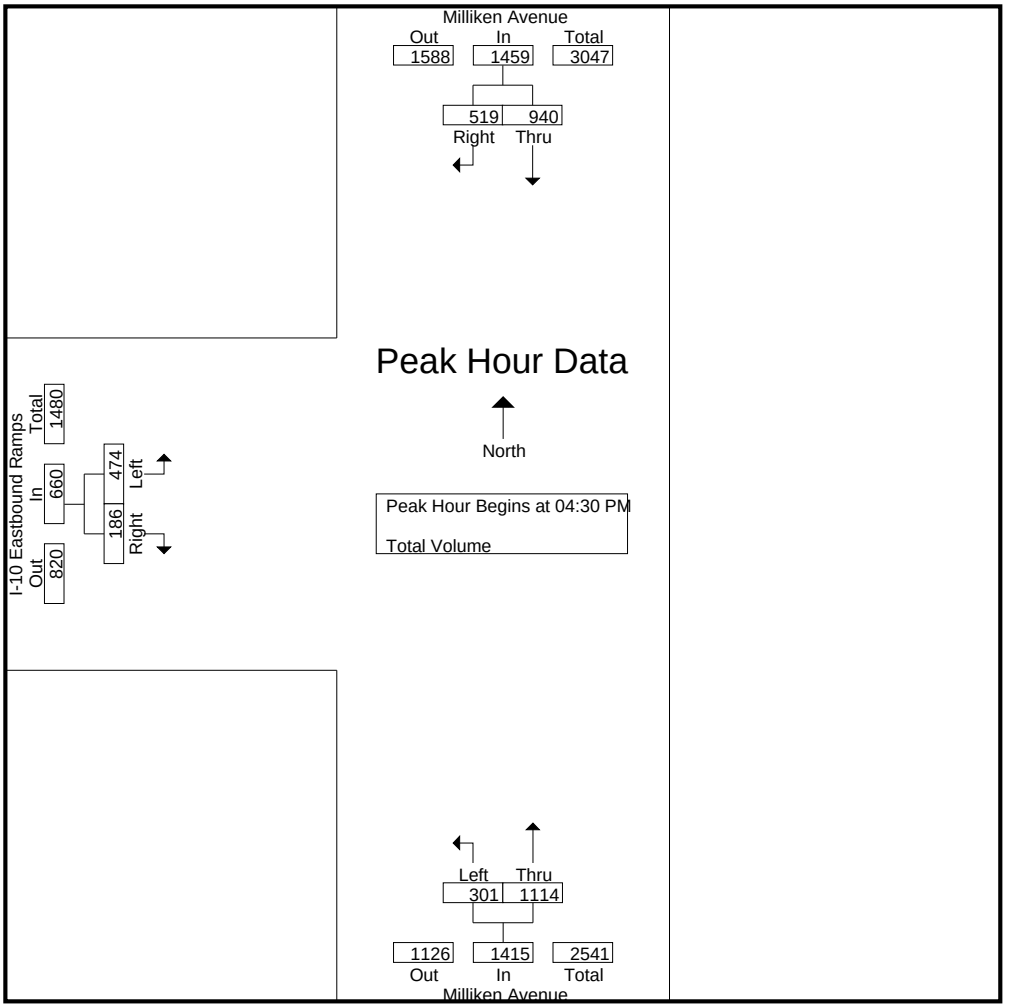
City of Ontario
N/S: Milliken Avenue
E/W: I-10 Eastbound Ramps
Weather: Clear

File Name : 09_ONT_Milliken_10E PM
Site Code : 99919684
Start Date : 11/6/2019
Page No : 2



Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM			04:15 PM			03:00 PM		
+0 mins.	225	120	345	65	294	359	134	**54**	188
+15 mins.	**256**	130	386	**94**	**310**	**404**	**153**	52	**205**
+30 mins.	242	**160**	**402**	70	262	332	106	53	159
+45 mins.	237	103	340	81	294	375	121	42	163
Total Volume	960	513	1473	310	1160	1470	514	201	715
% App. Total	65.2	34.8		21.1	78.9		71.9	28.1	
PHF	.938	.802	.916	.824	.935	.910	.840	.931	.872

Counts Unlimited, Inc.

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Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Ontario
4th Street
B/ haven Avenue - Milliken Avenue
24 Hour Directional Volume Count

ONT4HAMI
Site Code: 105-21235

Start Time	5/22/2021 Sat	Eastbound Morning	Eastbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Westbound Morning	Westbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		25	180			64	237				
12:15		12	190			44	222				
12:30		20	185			37	192				
12:45		18	**235**	75	790	33	258	178	909	253	1699
01:00		25	**223**			30	237				
01:15		11	**216**			38	259				
01:30		15	**190**			33	235				
01:45		14	198	65	827	25	247	126	978	191	1805
02:00		8	184			22	224				
02:15		8	186			17	204				
02:30		12	212			25	234				
02:45		6	196	34	778	19	200	83	862	117	1640
03:00		5	149			24	225				
03:15		10	181			22	250				
03:30		15	193			27	273				
03:45		14	187	44	710	27	217	100	965	144	1675
04:00		2	195			24	**270**				
04:15		7	202			27	**243**				
04:30		11	159			30	**232**				
04:45		6	203	26	759	55	**281**	136	1026	162	1785
05:00		8	154			22	207				
05:15		16	167			41	267				
05:30		17	165			50	221				
05:45		29	152	70	638	63	244	176	939	246	1577
06:00		19	135			40	207				
06:15		29	151			36	229				
06:30		21	151			54	231				
06:45		34	144	103	581	79	209	209	876	312	1457
07:00		38	122			47	215				
07:15		30	106			50	193				
07:30		43	85			61	166				
07:45		43	76	154	389	76	115	234	689	388	1078
08:00		41	73			65	137				
08:15		48	80			74	140				
08:30		61	75			78	126				
08:45		78	64	228	292	127	119	344	522	572	814
09:00		76	55			115	105				
09:15		90	61			119	97				
09:30		105	35			117	73				
09:45		107	34	378	185	155	65	506	340	884	525
10:00		125	33			170	69				
10:15		130	31			133	58				
10:30		140	35			157	40				
10:45		147	9	542	108	**183**	33	643	200	1185	308
11:00		**134**	24			**176**	55				
11:15		**167**	19			**173**	31				
11:30		**168**	10			**180**	37				
11:45		**179**	17	648	70	182	48	711	171	1359	241
Total		2367	6127	2367	6127	3446	8477	3446	8477	5813	14604
Combined Total		8494		8494		11923		11923		20417	
AM Peak	-	11:00	-	-	-	10:45	-	-	-	-	-
Vol.	-	648	-	-	-	712	-	-	-	-	-
P.H.F.		0.905				0.973					
PM Peak	-	-	00:45	-	-	-	04:00	-	-	-	-
Vol.	-	-	864	-	-	-	1026	-	-	-	-
P.H.F.			0.919				0.913				
Percentage		27.9%	72.1%			28.9%	71.1%				
ADT/AADT		ADT 20,417		AADT 20,417							

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Corona, CA 92878
(951)268-6268

City of Ontario
N/S: Haven Avenue
E/W: Fourth Street
Weather: Clear

File Name : 01_ONT_Haven_4th Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 1

Groups Printed- Total Volume

	Haven Avenue Southbound				Fourth Street Westbound				Haven Avenue Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
12:45 PM	43	188	11	242	31	76	28	135	24	229	59	312	15	89	22	126	815
Total	43	188	11	242	31	76	28	135	24	229	59	312	15	89	22	126	815
01:00 PM	29	190	11	230	45	88	32	165	19	208	79	306	16	108	17	141	842
01:15 PM	43	209	13	265	35	80	29	144	25	206	51	282	8	101	19	128	819
01:30 PM	25	226	16	267	32	91	32	155	29	190	61	280	12	88	22	122	824
01:45 PM	34	197	17	248	39	90	27	156	36	231	40	307	7	92	18	117	828
Total	131	822	57	1010	151	349	120	620	109	835	231	1175	43	389	76	508	3313
02:00 PM	33	178	13	224	29	113	32	174	26	204	85	315	5	112	23	140	853
02:15 PM	30	209	10	249	39	67	27	133	29	165	62	256	13	89	20	122	760
02:30 PM	28	207	16	251	40	101	34	175	40	214	69	323	12	98	30	140	889
Grand Total	265	1604	107	1976	290	706	241	1237	228	1647	506	2381	88	777	171	1036	6630
Apprch %	13.4	81.2	5.4		23.4	57.1	19.5		9.6	69.2	21.3		8.5	75	16.5		
Total %	4	24.2	1.6	29.8	4.4	10.6	3.6	18.7	3.4	24.8	7.6	35.9	1.3	11.7	2.6	15.6	

	Haven Avenue Southbound				Fourth Street Westbound				Haven Avenue Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:45 PM																	
01:45 PM	**34**	197	**17**	248	39	90	27	156	36	**231**	40	307	7	92	18	117	828
02:00 PM	33	178	13	224	29	**113**	32	174	26	204	**85**	315	5	**112**	23	**140**	853
02:15 PM	30	**209**	10	249	39	67	27	133	29	165	62	256	**13**	89	20	122	760
02:30 PM	28	207	16	**251**	**40**	101	**34**	**175**	**40**	214	69	**323**	12	98	**30**	140	**889**
Total Volume	125	791	56	972	147	371	120	638	131	814	256	1201	37	391	91	519	3330
% App. Total	12.9	81.4	5.8		23	58.2	18.8		10.9	67.8	21.3		7.1	75.3	17.5		
PHF	.919	.946	.824	.968	.919	.821	.882	.911	.819	.881	.753	.930	.712	.873	.758	.927	.936

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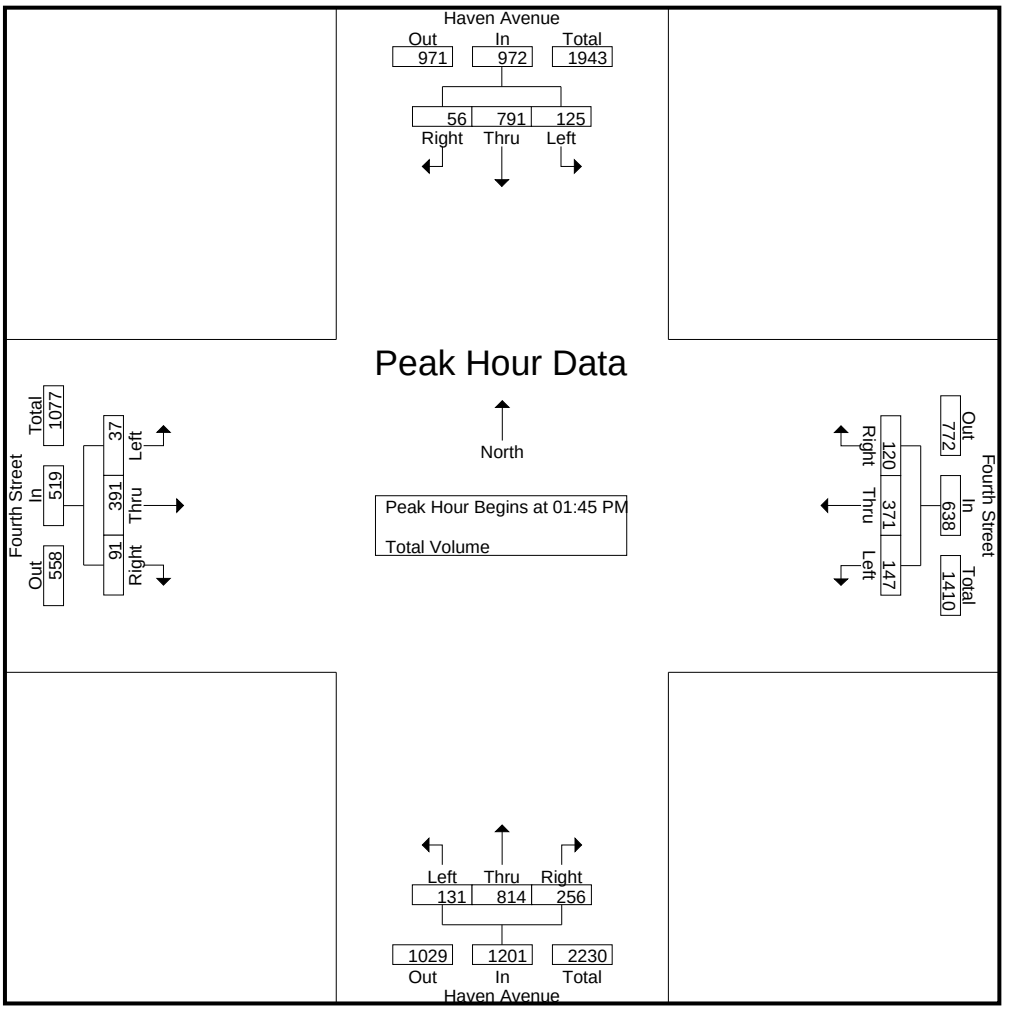
City of Ontario
N/S: Haven Avenue
E/W: Fourth Street
Weather: Clear

File Name : 01_ONT_Haven_4th Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 2



Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	01:00 PM				01:45 PM				01:45 PM				01:45 PM			
+0 mins.	29	190	11	230	39	90	27	156	36	**231**	40	307	7	92	18	117
+15 mins.	**43**	209	13	265	29	**113**	32	174	26	204	**85**	315	5	**112**	23	**140**
+30 mins.	25	**226**	16	**267**	39	67	27	133	29	165	62	256	**13**	89	20	122
+45 mins.	34	197	**17**	248	**40**	101	**34**	**175**	**40**	214	69	**323**	12	98	**30**	140
Total Volume	131	822	57	1010	147	371	120	638	131	814	256	1201	37	391	91	519
% App. Total	13	81.4	5.6		23	58.2	18.8		10.9	67.8	21.3		7.1	75.3	17.5	
PHF	.762	.909	.838	.946	.919	.821	.882	.911	.819	.881	.753	.930	.712	.873	.758	.927

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City of Ontario
N/S: Cleveland Avenue/Via Asti
E/W: Fourth Street
Weather: Clear

File Name : 02_ONT_Via Asti_4th Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 1

Groups Printed- Total Volume

	Cleveland Avenue Southbound				Fourth Street Westbound				Via Asti Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
12:45 PM	1	1	2	4	0	159	2	161	3	0	2	5	0	224	1	225	395
Total	1	1	2	4	0	159	2	161	3	0	2	5	0	224	1	225	395
01:00 PM	2	0	1	3	0	146	0	146	0	1	1	2	0	198	0	198	349
01:15 PM	1	0	0	1	0	150	0	150	0	0	0	0	0	229	1	230	381
01:30 PM	1	0	1	2	1	162	2	165	0	0	0	0	0	176	0	176	343
01:45 PM	0	0	0	0	0	183	0	183	0	0	2	2	0	199	2	201	386
Total	4	0	2	6	1	641	2	644	0	1	3	4	0	802	3	805	1459
02:00 PM	0	0	0	0	1	152	1	154	0	0	1	1	0	226	0	226	381
02:15 PM	0	0	0	0	0	137	0	137	3	0	1	4	0	185	1	186	327
02:30 PM	0	0	2	2	1	174	0	175	2	0	1	3	0	213	0	213	393
Grand Total	5	1	6	12	3	1263	5	1271	8	1	8	17	0	1650	5	1655	2955
Apprch %	41.7	8.3	50		0.2	99.4	0.4		47.1	5.9	47.1		0	99.7	0.3		
Total %	0.2	0	0.2	0.4	0.1	42.7	0.2	43	0.3	0	0.3	0.6	0	55.8	0.2	56	

	Cleveland Avenue Southbound				Fourth Street Westbound				Via Asti Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:15 PM																	
01:15 PM	**1**	0	0	1	0	150	0	150	0	0	0	0	0	**229**	1	**230**	381
01:30 PM	1	0	**1**	**2**	**1**	162	**2**	165	0	0	0	0	0	176	0	176	343
01:45 PM	0	0	0	0	0	**183**	0	**183**	0	0	**2**	**2**	0	199	**2**	201	**386**
02:00 PM	0	0	0	0	1	152	1	154	0	0	1	1	0	226	0	226	381
Total Volume	2	0	1	3	2	647	3	652	0	0	3	3	0	830	3	833	1491
% App. Total	66.7	0	33.3		0.3	99.2	0.5		0	0	100		0	99.6	0.4		
PHF	.500	.000	.250	.375	.500	.884	.375	.891	.000	.000	.375	.375	.000	.906	.375	.905	.966

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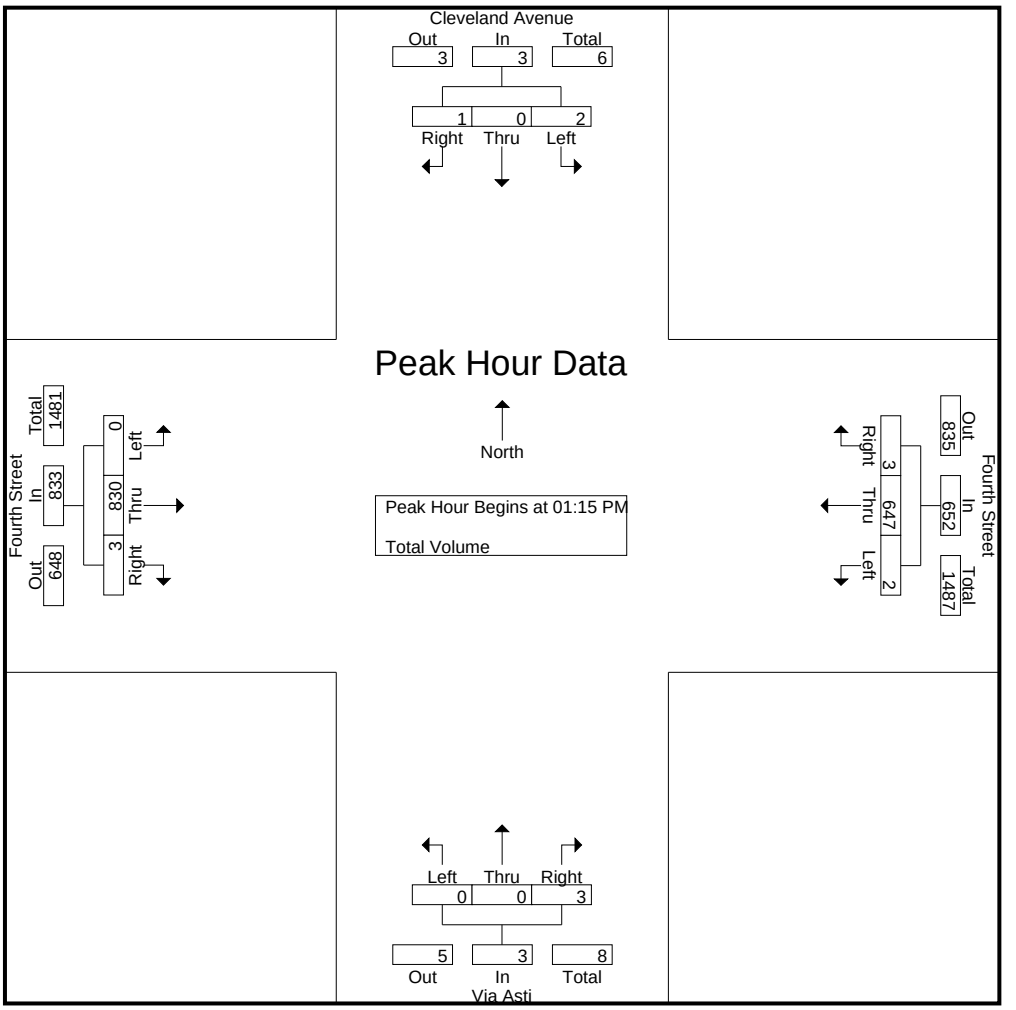
City of Ontario
N/S: Cleveland Avenue/Via Asti
E/W: Fourth Street
Weather: Clear

File Name : 02_ONT_Via Asti_4th Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 2



Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:45 PM				01:15 PM				01:45 PM				01:15 PM			
+0 mins.	1	**1**	**2**	**4**	0	150	0	150	0	0	**2**	2	0	**229**	1	**230**
+15 mins.	**2**	0	1	3	**1**	162	**2**	165	0	0	1	1	0	176	0	176
+30 mins.	1	0	0	1	0	**183**	0	**183**	**3**	0	1	**4**	0	199	**2**	201
+45 mins.	1	0	1	2	1	152	1	154	2	0	1	3	0	226	0	226
Total Volume	5	1	4	10	2	647	3	652	5	0	5	10	0	830	3	833
% App. Total	50	10	40		0.3	99.2	0.5		50	0	50		0	99.6	0.4	
PHF	.625	.250	.500	.625	.500	.884	.375	.891	.417	.000	.625	.625	.000	.906	.375	.905

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City of Ontario
N/S: The Resort Parkway/Via Piemonte
E/W: Fourth Street
Weather: Clear

File Name : 03_ONT_The Resort_4th Sat
Site Code : 10521235
Start Date : 6/5/2021

Groups Printed- Total Volume

	The Resort Parkway Southbound				Fourth Street Westbound				Via Piemonte Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
12:45 PM	12	1	5	18	0	147	6	153	2	0	2	4	1	218	5	224	399
Total	12	1	5	18	0	147	6	153	2	0	2	4	1	218	5	224	399
01:00 PM	13	1	1	15	1	143	2	146	1	0	4	5	2	201	0	203	369
01:15 PM	9	1	2	12	1	146	4	151	1	0	0	1	3	226	0	229	393
01:30 PM	4	0	4	8	0	153	6	159	1	0	1	2	3	176	1	180	349
01:45 PM	10	0	6	16	1	169	9	179	0	0	0	0	2	200	1	203	398
Total	36	2	13	51	3	611	21	635	3	0	5	8	10	803	2	815	1509
02:00 PM	7	0	3	10	1	154	4	159	0	0	0	0	3	221	0	224	393
02:15 PM	10	1	1	12	1	142	8	151	0	0	4	4	3	184	4	191	358
02:30 PM	6	0	1	7	1	162	12	175	2	0	2	4	0	211	1	212	398
Grand Total	71	4	23	98	6	1216	51	1273	7	0	13	20	17	1637	12	1666	3057
Apprch %	72.4	4.1	23.5		0.5	95.5	4		35	0	65		1	98.3	0.7		
Total %	2.3	0.1	0.8	3.2	0.2	39.8	1.7	41.6	0.2	0	0.4	0.7	0.6	53.5	0.4	54.5	

	The Resort Parkway Southbound				Fourth Street Westbound				Via Piemonte Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:45 PM																	
01:45 PM	**10**	0	**6**	**16**	**1**	**169**	9	**179**	0	0	0	0	2	200	1	203	**398**
02:00 PM	7	0	3	10	1	154	4	159	0	0	0	0	**3**	**221**	0	**224**	393
02:15 PM	10	**1**	1	12	1	142	8	151	0	0	**4**	**4**	3	184	**4**	191	358
02:30 PM	6	0	1	7	1	162	**12**	175	**2**	0	2	4	0	211	1	212	398
Total Volume	33	1	11	45	4	627	33	664	2	0	6	8	8	816	6	830	1547
% App. Total	73.3	2.2	24.4		0.6	94.4	5		25	0	75		1	98.3	0.7		
PHF	.825	.250	.458	.703	1.00	.928	.688	.927	.250	.000	.375	.500	.667	.923	.375	.926	.972

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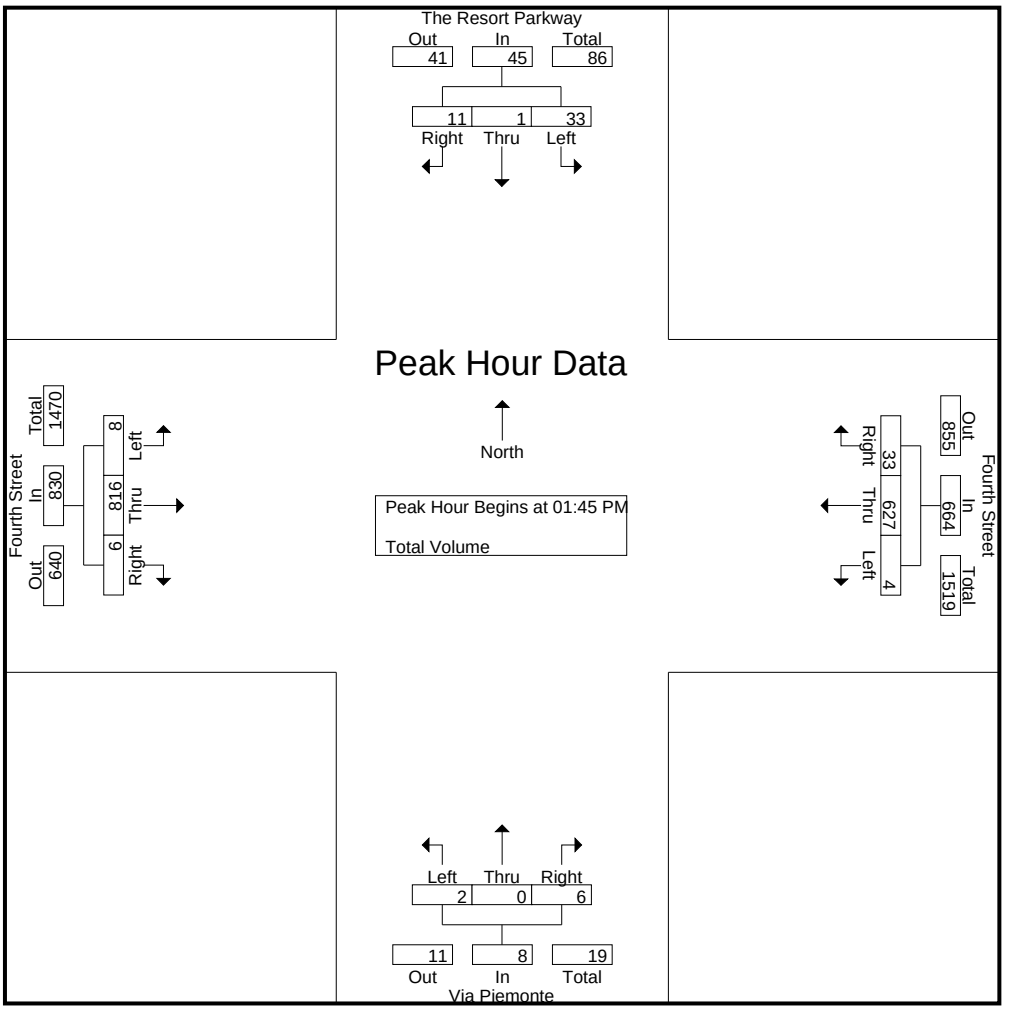
City of Ontario
N/S: The Resort Parkway/Via Piemonte
E/W: Fourth Street
Weather: Clear

File Name : 03_ONT_The Resort_4th Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 2



Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:45 PM				01:45 PM				12:45 PM				12:45 PM			
+0 mins.	12	**1**	**5**	**18**	**1**	**169**	9	**179**	**2**	0	2	4	1	218	**5**	224
+15 mins.	**13**	1	1	15	1	154	4	159	1	0	**4**	**5**	2	201	0	203
+30 mins.	9	1	2	12	1	142	8	151	1	0	0	1	**3**	**226**	0	**229**
+45 mins.	4	0	4	8	1	162	**12**	175	1	0	1	2	3	176	1	180
Total Volume	38	3	12	53	4	627	33	664	5	0	7	12	9	821	6	836
% App. Total	71.7	5.7	22.6		0.6	94.4	5		41.7	0	58.3		1.1	98.2	0.7	
PHF	.731	.750	.600	.736	1.000	.928	.688	.927	.625	.000	.438	.600	.750	.908	.300	.913

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City of Ontario
N/S: The Project Driveway 3
E/W: Fourth Street
Weather: Clear

File Name : 04_ONT_PDW3_4th Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 1

Groups Printed- Total Volume

	Fourth Street Westbound			The Project Driveway 3 Northbound			Fourth Street Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
12:45 PM	0	149	149	0	1	1	225	12	237	387
Total	0	149	149	0	1	1	225	12	237	387
01:00 PM	0	146	146	0	3	3	210	11	221	370
01:15 PM	0	158	158	0	2	2	228	7	235	395
01:30 PM	0	156	156	0	3	3	173	9	182	341
01:45 PM	0	190	190	0	3	3	204	11	215	408
Total	0	650	650	0	11	11	815	38	853	1514
02:00 PM	0	164	164	0	0	0	219	9	228	392
02:15 PM	0	151	151	0	4	4	179	15	194	349
02:30 PM	0	174	174	0	4	4	200	18	218	396
Grand Total	0	1288	1288	0	20	20	1638	92	1730	3038
Apprch %	0	100		0	100		94.7	5.3		
Total %	0	42.4	42.4	0	0.7	0.7	53.9	3	56.9	

	Fourth Street Westbound			The Project Driveway 3 Northbound			Fourth Street Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 01:45 PM										
01:45 PM	0	**190**	**190**	0	3	3	204	11	215	**408**
02:00 PM	0	164	164	0	0	0	**219**	9	**228**	392
02:15 PM	0	151	151	0	**4**	**4**	179	15	194	349
02:30 PM	0	174	174	0	4	4	200	**18**	218	396
Total Volume	0	679	679	0	11	11	802	53	855	1545
% App. Total	0	100		0	100		93.8	6.2		
PHF	.000	.893	.893	.000	.688	.688	.916	.736	.938	.947

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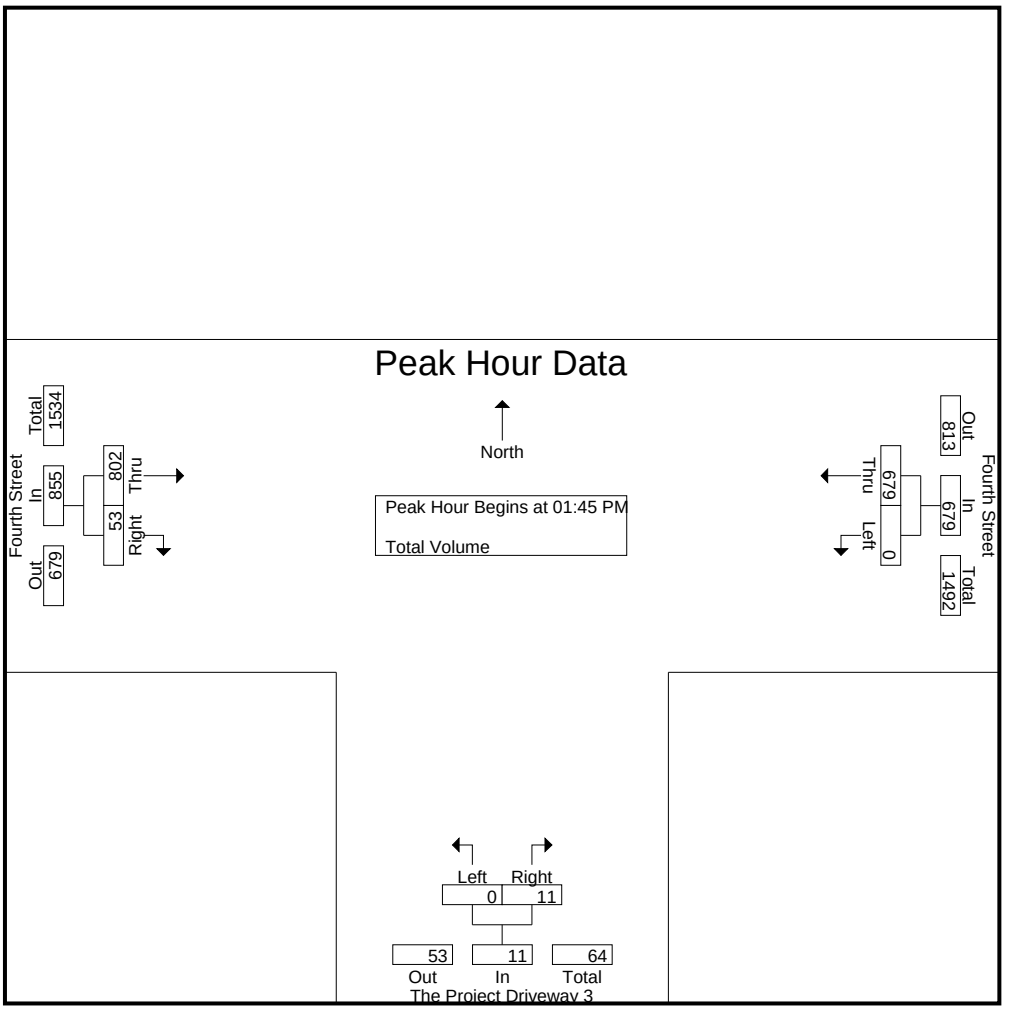
City of Ontario
N/S: The Project Driveway 3
E/W: Fourth Street
Weather: Clear

File Name : 04_ONT_PDW3_4th Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 2



Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	01:45 PM			01:00 PM			12:45 PM		
+0 mins.	0	**190**	**190**	0	**3**	**3**	225	**12**	**237**
+15 mins.	0	164	164	0	2	2	210	11	221
+30 mins.	0	151	151	0	3	3	**228**	7	235
+45 mins.	0	174	174	0	3	3	173	9	182
Total Volume	0	679	679	0	11	11	836	39	875
% App. Total	0	100		0	100		95.5	4.5	
PHF	.000	.893	.893	.000	.917	.917	.917	.813	.923

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City of Ontario
N/S: Milliken Avenue
E/W: Fourth Street
Weather: Clear

File Name : 05_ONT_Milliken_Fourth Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 1

Groups Printed- Total Volume

	Milliken Avenue Southbound				Fourth Street Westbound				Milliken Avenue Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
12:45 PM	58	146	21	225	107	103	48	258	31	128	73	232	49	227	49	325	1040
Total	58	146	21	225	107	103	48	258	31	128	73	232	49	227	49	325	1040
01:00 PM	76	129	35	240	67	126	44	237	29	150	76	255	55	146	36	237	969
01:15 PM	68	154	28	250	105	129	49	283	46	159	61	266	40	162	65	267	1066
01:30 PM	75	156	24	255	95	111	56	262	41	168	48	257	50	116	51	217	991
01:45 PM	90	151	20	261	79	104	47	230	31	142	63	236	38	141	42	221	948
Total	309	590	107	1006	346	470	196	1012	147	619	248	1014	183	565	194	942	3974
02:00 PM	68	129	26	223	79	112	50	241	38	129	69	236	60	137	48	245	945
02:15 PM	60	163	32	255	87	118	46	251	31	156	86	273	41	136	59	236	1015
02:30 PM	62	159	20	241	88	122	52	262	43	143	63	249	58	149	45	252	1004
Grand Total	557	1187	206	1950	707	925	392	2024	290	1175	539	2004	391	1214	395	2000	7978
Apprch %	28.6	60.9	10.6		34.9	45.7	19.4		14.5	58.6	26.9		19.5	60.7	19.8		
Total %	7	14.9	2.6	24.4	8.9	11.6	4.9	25.4	3.6	14.7	6.8	25.1	4.9	15.2	5	25.1	

	Milliken Avenue Southbound				Fourth Street Westbound				Milliken Avenue Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:45 PM																	
12:45 PM	58	146	21	225	**107**	103	48	258	31	128	73	232	49	**227**	49	**325**	1040
01:00 PM	**76**	129	**35**	240	67	126	44	237	29	150	**76**	255	**55**	146	36	237	969
01:15 PM	68	154	28	250	105	**129**	49	**283**	**46**	159	61	**266**	40	162	**65**	267	**1066**
01:30 PM	75	**156**	24	**255**	95	111	**56**	262	41	**168**	48	257	50	116	51	217	991
Total Volume	277	585	108	970	374	469	197	1040	147	605	258	1010	194	651	201	1046	4066
% App. Total	28.6	60.3	11.1		36	45.1	18.9		14.6	59.9	25.5		18.5	62.2	19.2		
PHF	.911	.938	.771	.951	.874	.909	.879	.919	.799	.900	.849	.949	.882	.717	.773	.805	.954

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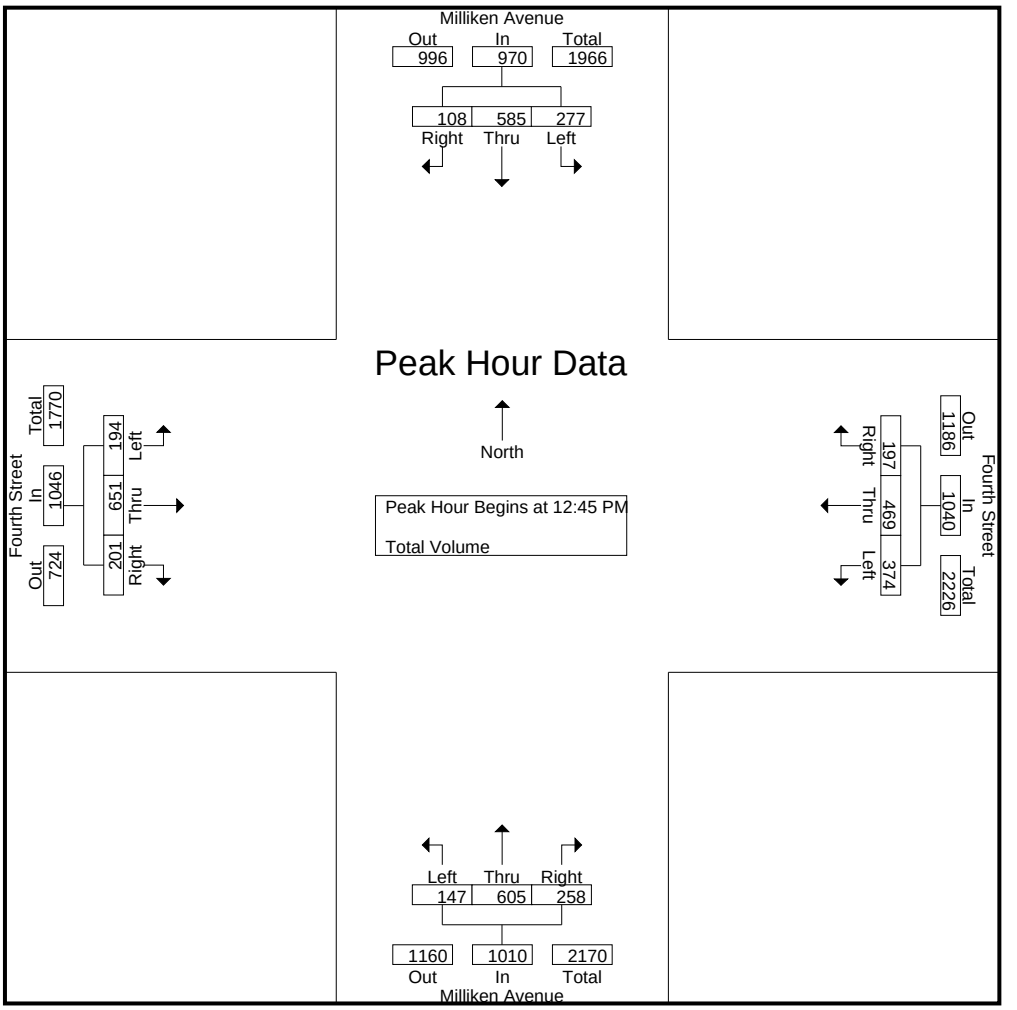
City of Ontario
N/S: Milliken Avenue
E/W: Fourth Street
Weather: Clear

File Name : 05_ONT_Milliken_Fourth Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 2



Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	01:00 PM				12:45 PM				01:00 PM				12:45 PM			
+0 mins.	76	129	**35**	240	**107**	103	48	258	29	150	**76**	255	49	**227**	49	**325**
+15 mins.	68	154	28	250	67	126	44	237	**46**	159	61	**266**	**55**	146	36	237
+30 mins.	75	**156**	24	255	105	**129**	49	**283**	41	**168**	48	257	40	162	**65**	267
+45 mins.	**90**	151	20	**261**	95	111	**56**	262	31	142	63	236	50	116	51	217
Total Volume	309	590	107	1006	374	469	197	1040	147	619	248	1014	194	651	201	1046
% App. Total	30.7	58.6	10.6		36	45.1	18.9		14.5	61	24.5		18.5	62.2	19.2	
PHF	.858	.946	.764	.964	.874	.909	.879	.919	.799	.921	.816	.953	.882	.717	.773	.805

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City of Ontario
N/S: I-15 SB Ramps/Ontario Mills Drive
E/W: Fourth Street
Weather: Clear

File Name : 06_ONT_15S_Fourth Sat
Site Code : 10521235
Start Date : 6/5/2021

Groups Printed- Total Volume

	I-15 Southbound Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
12:45 PM	15	130	141	286	93	156	67	316	22	61	87	170	141	189	34	364	1136
Total	15	130	141	286	93	156	67	316	22	61	87	170	141	189	34	364	1136
01:00 PM	9	98	158	265	63	160	63	286	32	50	82	164	119	198	22	339	1054
01:15 PM	10	109	134	253	74	163	72	309	35	59	96	190	127	219	31	377	1129
01:30 PM	14	111	117	242	61	145	96	302	40	56	81	177	131	151	24	306	1027
01:45 PM	13	116	124	253	71	143	80	294	33	76	83	192	129	181	29	339	1078
Total	46	434	533	1013	269	611	311	1191	140	241	342	723	506	749	106	1361	4288
02:00 PM	6	101	126	233	71	135	62	268	35	74	104	213	131	182	26	339	1053
02:15 PM	17	99	105	221	62	156	60	278	32	71	110	213	169	189	17	375	1087
02:30 PM	12	115	128	255	66	172	77	315	32	65	105	202	161	175	18	354	1126
Grand Total	96	879	1033	2008	561	1230	577	2368	261	512	748	1521	1108	1484	201	2793	8690
Apprch %	4.8	43.8	51.4		23.7	51.9	24.4		17.2	33.7	49.2		39.7	53.1	7.2		
Total %	1.1	10.1	11.9	23.1	6.5	14.2	6.6	27.2	3	5.9	8.6	17.5	12.8	17.1	2.3	32.1	

	I-15 Southbound Ramps Southbound				Fourth Street Westbound				Ontario Mills Drive Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:45 PM																	
12:45 PM	**15**	**130**	141	**286**	**93**	156	67	**316**	22	**61**	87	170	**141**	189	**34**	364	**1136**
01:00 PM	9	98	**158**	265	63	160	63	286	32	50	82	164	119	198	22	339	1054
01:15 PM	10	109	134	253	74	**163**	72	309	35	59	**96**	**190**	127	**219**	31	**377**	1129
01:30 PM	14	111	117	242	61	145	**96**	302	**40**	56	81	177	131	151	24	306	1027
Total Volume	48	448	550	1046	291	624	298	1213	129	226	346	701	518	757	111	1386	4346
% App. Total	4.6	42.8	52.6		24	51.4	24.6		18.4	32.2	49.4		37.4	54.6	8		
PHF	.800	.862	.870	.914	.782	.957	.776	.960	.806	.926	.901	.922	.918	.864	.816	.919	.956

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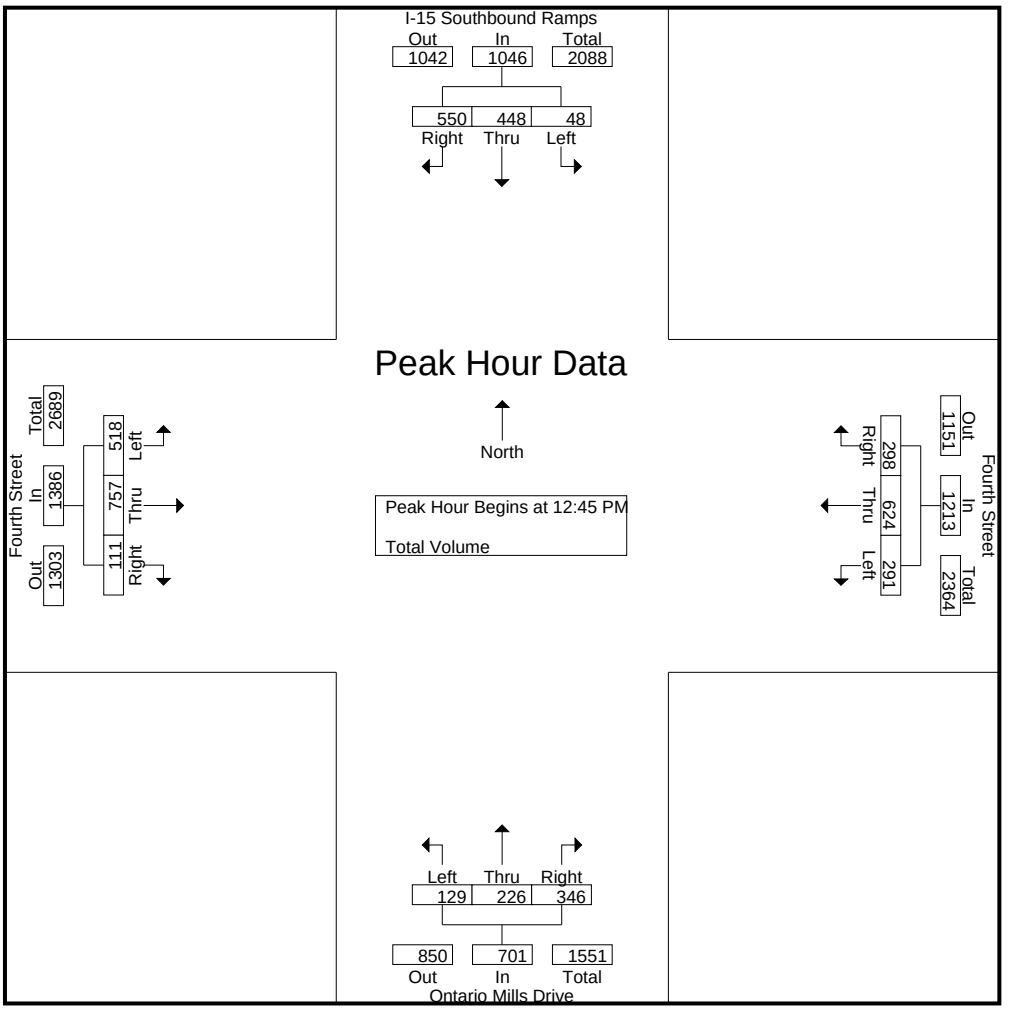
City of Ontario
N/S: I-15 SB Ramps/Ontario Mills Drive
E/W: Fourth Street
Weather: Clear

File Name : 06_ONT_15S_Fourth Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 2



Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:45 PM				12:45 PM				01:45 PM				01:45 PM			
+0 mins.	**15**	**130**	141	**286**	**93**	156	67	**316**	33	**76**	83	192	129	181	**29**	339
+15 mins.	9	98	**158**	265	63	160	63	286	**35**	74	104	**213**	131	182	26	339
+30 mins.	10	109	134	253	74	**163**	72	309	32	71	**110**	213	**169**	**189**	17	**375**
+45 mins.	14	111	117	242	61	145	**96**	302	32	65	105	202	161	175	18	354
Total Volume	48	448	550	1046	291	624	298	1213	132	286	402	820	590	727	90	1407
% App. Total	4.6	42.8	52.6		24	51.4	24.6		16.1	34.9	49		41.9	51.7	6.4	
PHF	.800	.862	.870	.914	.782	.957	.776	.960	.943	.941	.914	.962	.873	.962	.776	.938

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City of Ontario
N/S: I-15 Northbound Ramps
E/W: Fourth Street
Weather: Clear

File Name : 07_ONT_15N_Fourth Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 1

Groups Printed- Total Volume

	I-15 Northbound Ramps Southbound				Fourth Street Westbound				The Exchange Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
12:45 PM	10	10	192	212	7	107	11	125	20	13	11	44	185	75	21	281	662
Total	10	10	192	212	7	107	11	125	20	13	11	44	185	75	21	281	662
01:00 PM	12	18	197	227	3	73	9	85	11	12	9	32	180	91	12	283	627
01:15 PM	19	12	212	243	6	91	16	113	15	10	7	32	192	103	13	308	696
01:30 PM	9	14	203	226	7	89	16	112	21	13	6	40	162	70	20	252	630
01:45 PM	12	12	202	226	9	78	5	92	18	12	7	37	175	73	15	263	618
Total	52	56	814	922	25	331	46	402	65	47	29	141	709	337	60	1106	2571
02:00 PM	7	11	188	206	4	77	15	96	11	15	8	34	183	92	11	286	622
02:15 PM	13	10	183	206	5	75	7	87	20	12	3	35	194	91	26	311	639
02:30 PM	8	10	210	228	5	87	7	99	19	10	8	37	177	100	19	296	660
Grand Total	90	97	1587	1774	46	677	86	809	135	97	59	291	1448	695	137	2280	5154
Apprch %	5.1	5.5	89.5		5.7	83.7	10.6		46.4	33.3	20.3		63.5	30.5	6		
Total %	1.7	1.9	30.8	34.4	0.9	13.1	1.7	15.7	2.6	1.9	1.1	5.6	28.1	13.5	2.7	44.2	

	I-15 Northbound Ramps Southbound				Fourth Street Westbound				The Exchange Driveway Northbound				Fourth Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:45 PM																	
12:45 PM	10	10	192	212	**7**	**107**	11	**125**	20	**13**	**11**	**44**	185	75	**21**	281	662
01:00 PM	12	**18**	197	227	3	73	9	85	11	12	9	32	180	91	12	283	627
01:15 PM	**19**	12	**212**	**243**	6	91	**16**	113	15	10	7	32	**192**	**103**	13	**308**	**696**
01:30 PM	9	14	203	226	7	89	16	112	**21**	13	6	40	162	70	20	252	630
Total Volume	50	54	804	908	23	360	52	435	67	48	33	148	719	339	66	1124	2615
% App. Total	5.5	5.9	88.5		5.3	82.8	12		45.3	32.4	22.3		64	30.2	5.9		
PHF	.658	.750	.948	.934	.821	.841	.813	.870	.798	.923	.750	.841	.936	.823	.786	.912	.939

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City of Ontario
N/S: I-15 Northbound Ramps
E/W: Fourth Street
Weather: Clear

File Name : 07_ONT_15N_Fourth Sat
Site Code : 10521235
Start Date : 6/5/2021
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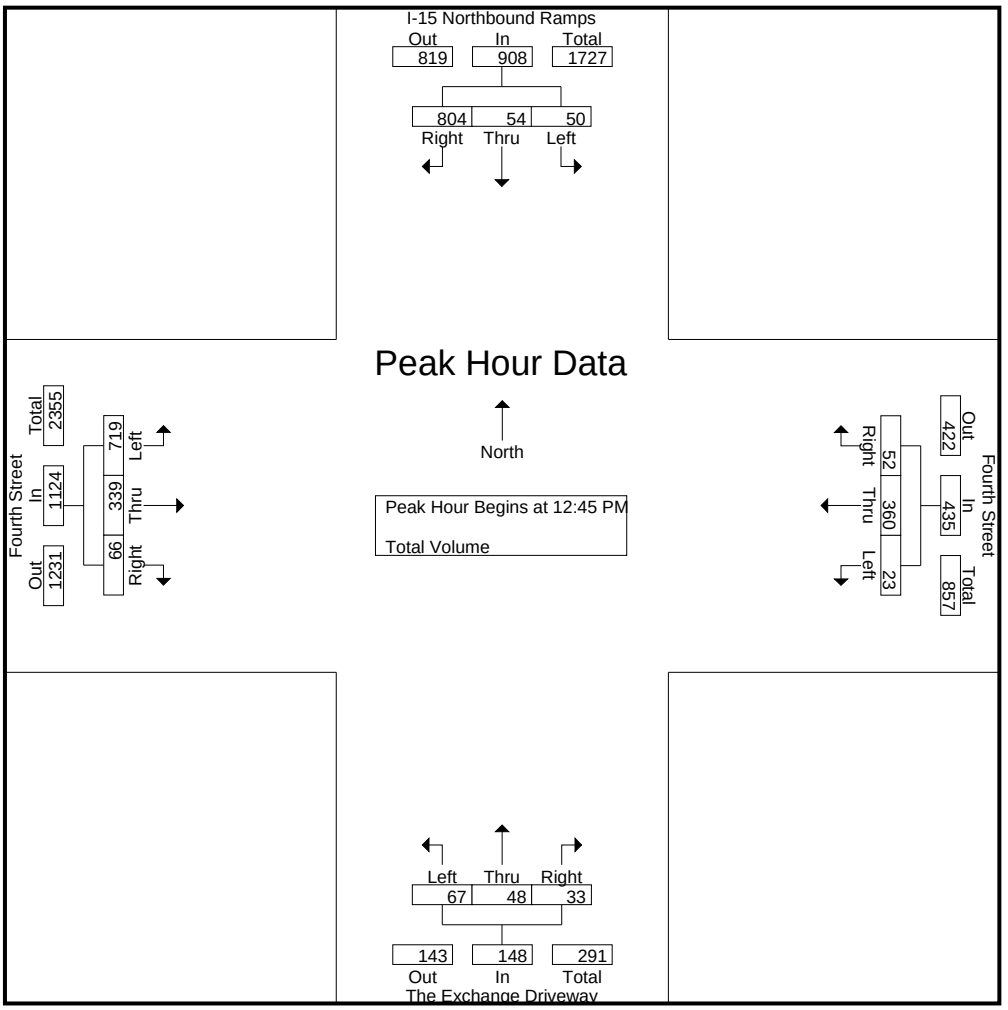

Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	01:00 PM				12:45 PM				12:45 PM				01:45 PM			
+0 mins.	12	**18**	197	227	**7**	**107**	11	**125**	20	**13**	**11**	**44**	175	73	15	263
+15 mins.	**19**	12	**212**	**243**	3	73	9	85	11	12	9	32	183	92	11	286
+30 mins.	9	14	203	226	6	91	**16**	113	15	10	7	32	**194**	91	**26**	**311**
+45 mins.	12	12	202	226	7	89	16	112	**21**	13	6	40	177	**100**	19	296
Total Volume	52	56	814	922	23	360	52	435	67	48	33	148	729	356	71	1156
% App. Total	5.6	6.1	88.3		5.3	82.8	12		45.3	32.4	22.3		63.1	30.8	6.1	
PHF	.684	.778	.960	.949	.821	.841	.813	.870	.798	.923	.750	.841	.939	.890	.683	.929

Counts Unlimited, Inc.
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City of Ontario
N/S: Haven Avenue
E/W: Concours Street
Weather: Clear

File Name : 08_ONT_Haven_Concours Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 1

Groups Printed- Total Volume

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
12:45 PM	7	218	3	228	18	14	10	42	20	313	23	356	4	3	8	15	641
Total	7	218	3	228	18	14	10	42	20	313	23	356	4	3	8	15	641
01:00 PM	7	268	5	280	20	11	17	48	6	278	29	313	2	2	9	13	654
01:15 PM	9	253	2	264	23	12	8	43	7	258	30	295	2	3	9	14	616
01:30 PM	6	278	8	292	25	10	10	45	8	283	45	336	5	9	11	25	698
01:45 PM	8	246	7	261	21	5	8	34	11	305	38	354	0	4	4	8	657
Total	30	1045	22	1097	89	38	43	170	32	1124	142	1298	9	18	33	60	2625
02:00 PM	5	222	7	234	16	11	11	38	14	280	32	326	3	2	5	10	608
02:15 PM	11	266	9	286	23	9	9	41	11	255	32	298	6	8	12	26	651
02:30 PM	7	273	7	287	18	12	10	40	3	308	18	329	0	4	9	13	669
Grand Total	60	2024	48	2132	164	84	83	331	80	2280	247	2607	22	35	67	124	5194
Apprch %	2.8	94.9	2.3		49.5	25.4	25.1		3.1	87.5	9.5		17.7	28.2	54		
Total %	1.2	39	0.9	41	3.2	1.6	1.6	6.4	1.5	43.9	4.8	50.2	0.4	0.7	1.3	2.4	

	Haven Avenue Southbound				Concours Street Westbound				Haven Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:00 PM																	
01:00 PM	7	268	5	280	20	11	**17**	**48**	6	278	29	313	2	2	9	13	654
01:15 PM	**9**	253	2	264	23	**12**	8	43	7	258	30	295	2	3	9	14	616
01:30 PM	6	**278**	**8**	**292**	**25**	10	10	45	8	283	**45**	336	**5**	**9**	**11**	**25**	**698**
01:45 PM	8	246	7	261	21	5	8	34	**11**	**305**	38	**354**	0	4	4	8	657
Total Volume	30	1045	22	1097	89	38	43	170	32	1124	142	1298	9	18	33	60	2625
% App. Total	2.7	95.3	2		52.4	22.4	25.3		2.5	86.6	10.9		15	30	55		
PHF	.833	.940	.688	.939	.890	.792	.632	.885	.727	.921	.789	.917	.450	.500	.750	.600	.940

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City of Ontario
N/S: Haven Avenue
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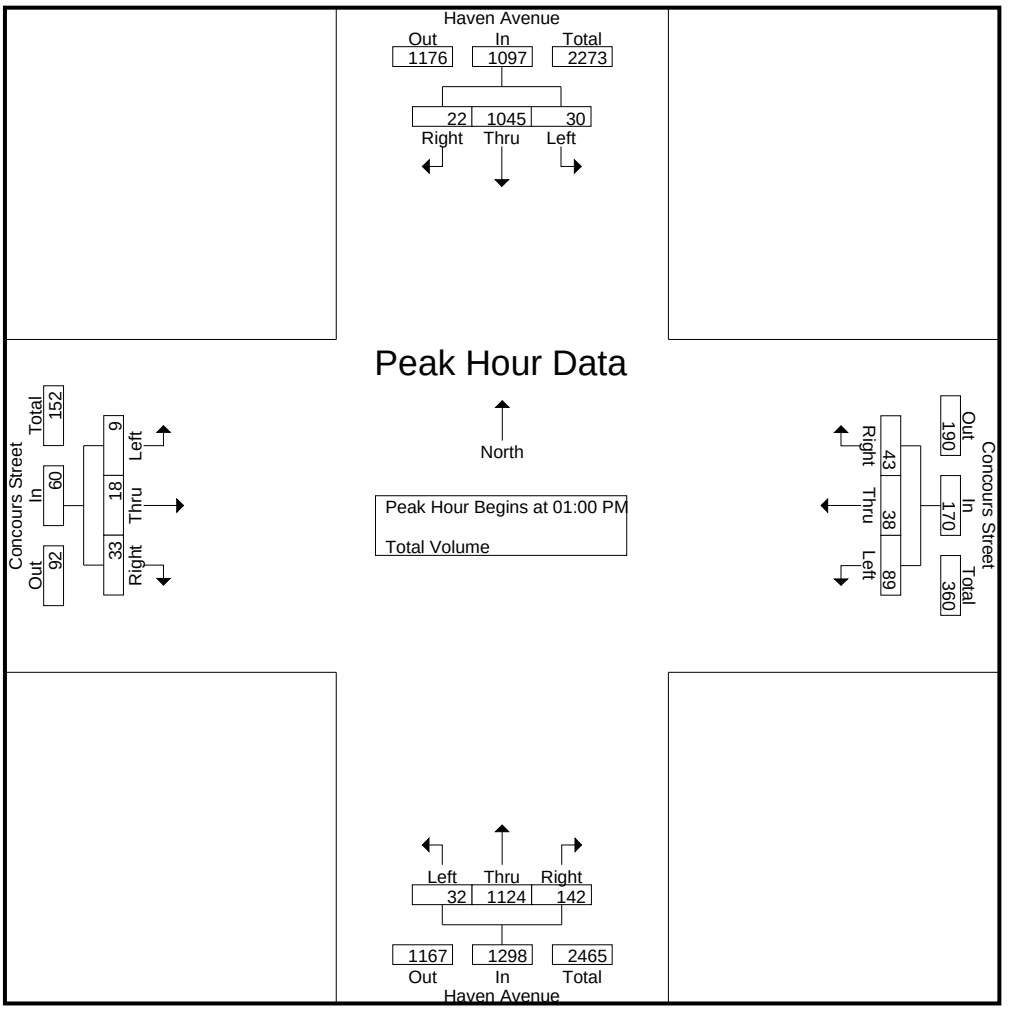
Weather: Clear

File Name : 08_ONT_Haven_Concours Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 2



Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	01:00 PM				12:45 PM				01:30 PM				01:30 PM			
+0 mins.	7	268	5	280	18	**14**	10	42	8	283	**45**	336	5	**9**	11	25
+15 mins.	**9**	253	2	264	20	11	**17**	**48**	11	**305**	38	**354**	0	4	4	8
+30 mins.	6	**278**	**8**	**292**	23	12	8	43	**14**	280	32	326	3	2	5	10
+45 mins.	8	246	7	261	**25**	10	10	45	11	255	32	298	**6**	8	**12**	**26**
Total Volume	30	1045	22	1097	86	47	45	178	44	1123	147	1314	14	23	32	69
% App. Total	2.7	95.3	2		48.3	26.4	25.3		3.3	85.5	11.2		20.3	33.3	46.4	
PHF	.833	.940	.688	.939	.860	.839	.662	.927	.786	.920	.817	.928	.583	.639	.667	.663

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City of Ontario
N/S: Ontario Center/Mercedes Lane
E/W: Concours Street
Weather: Clear

File Name : 09_ONT_Ont Ctr_Concours Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 1

Groups Printed- Total Volume

	Concours Street Southbound				Driveway Westbound				Concours Street Northbound				Ontario Center Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
12:45 PM	0	39	4	43	0	0	0	0	2	36	0	38	4	0	0	4	85
Total	0	39	4	43	0	0	0	0	2	36	0	38	4	0	0	4	85
01:00 PM	0	44	4	48	0	0	0	0	3	34	0	37	1	0	0	1	86
01:15 PM	0	41	2	43	0	0	0	0	1	42	0	43	2	0	0	2	88
01:30 PM	0	37	0	37	0	0	0	0	0	60	0	60	0	0	1	1	98
01:45 PM	0	42	3	45	0	0	0	0	1	57	1	59	6	0	1	7	111
Total	0	164	9	173	0	0	0	0	5	193	1	199	9	0	2	11	383
02:00 PM	0	36	1	37	0	0	0	0	2	46	0	48	2	0	0	2	87
02:15 PM	0	45	7	52	0	0	0	0	1	52	0	53	0	0	0	0	105
02:30 PM	0	39	7	46	0	0	0	0	2	33	0	35	2	0	2	4	85
Grand Total	0	323	28	351	0	0	0	0	12	360	1	373	17	0	4	21	745
Apprch %	0	92	8		0	0	0		3.2	96.5	0.3		81	0	19		
Total %	0	43.4	3.8	47.1	0	0	0	0	1.6	48.3	0.1	50.1	2.3	0	0.5	2.8	

	Concours Street Southbound				Driveway Westbound				Concours Street Northbound				Ontario Center Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:30 PM																	
01:30 PM	0	37	0	37	0	0	0	0	0	**60**	0	**60**	0	0	**1**	1	98
01:45 PM	0	42	3	45	0	0	0	0	1	57	**1**	59	**6**	0	1	**7**	**111**
02:00 PM	0	36	1	37	0	0	0	0	**2**	46	0	48	2	0	0	2	87
02:15 PM	0	**45**	**7**	**52**	0	0	0	0	1	52	0	53	0	0	0	0	105
Total Volume	0	160	11	171	0	0	0	0	4	215	1	220	8	0	2	10	401
% App. Total	0	93.6	6.4		0	0	0		1.8	97.7	0.5		80	0	20		
PHF	.000	.889	.393	.822	.000	.000	.000	.000	.500	.896	.250	.917	.333	.000	.500	.357	.903

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City of Ontario
N/S: Ontario Center/Mercedes Lane
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Weather: Clear

File Name : 09_ONT_Ont Ctr_Concours Sat
Site Code : 10521235
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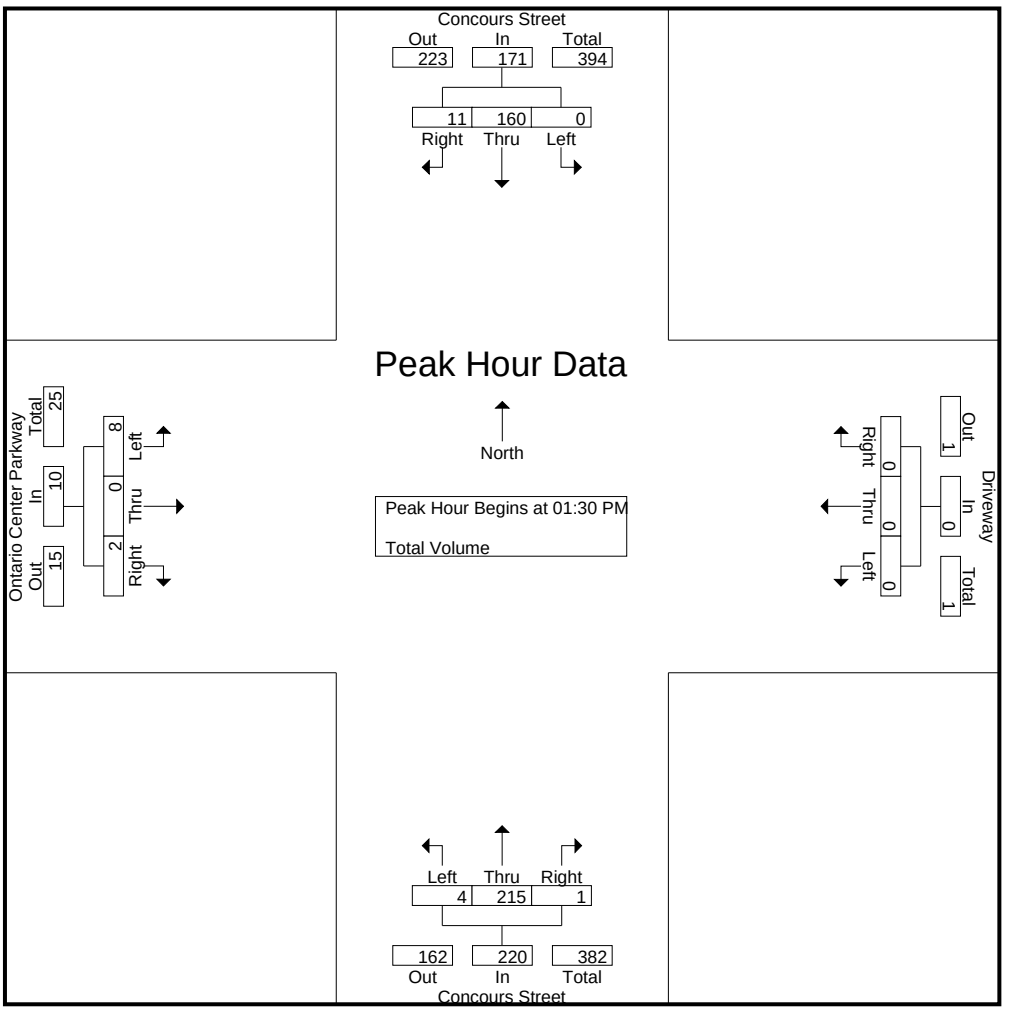

Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	01:45 PM				12:45 PM				01:30 PM				01:45 PM			
+0 mins.	0	42	3	45	0	0	0	0	0	**60**	0	**60**	**6**	0	1	**7**
+15 mins.	0	36	1	37	0	0	0	0	1	57	**1**	59	2	0	0	2
+30 mins.	0	**45**	**7**	**52**	0	0	0	0	**2**	46	0	48	0	0	0	0
+45 mins.	0	39	7	46	0	0	0	0	1	52	0	53	2	0	**2**	4
Total Volume	0	162	18	180	0	0	0	0	4	215	1	220	10	0	3	13
% App. Total	0	90	10		0	0	0		1.8	97.7	0.5		76.9	0	23.1	
PHF	.000	.900	.643	.865	.000	.000	.000	.000	.500	.896	.250	.917	.417	.000	.375	.464

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City of Ontario
N/S: Ontario Center/Mercedes Lane
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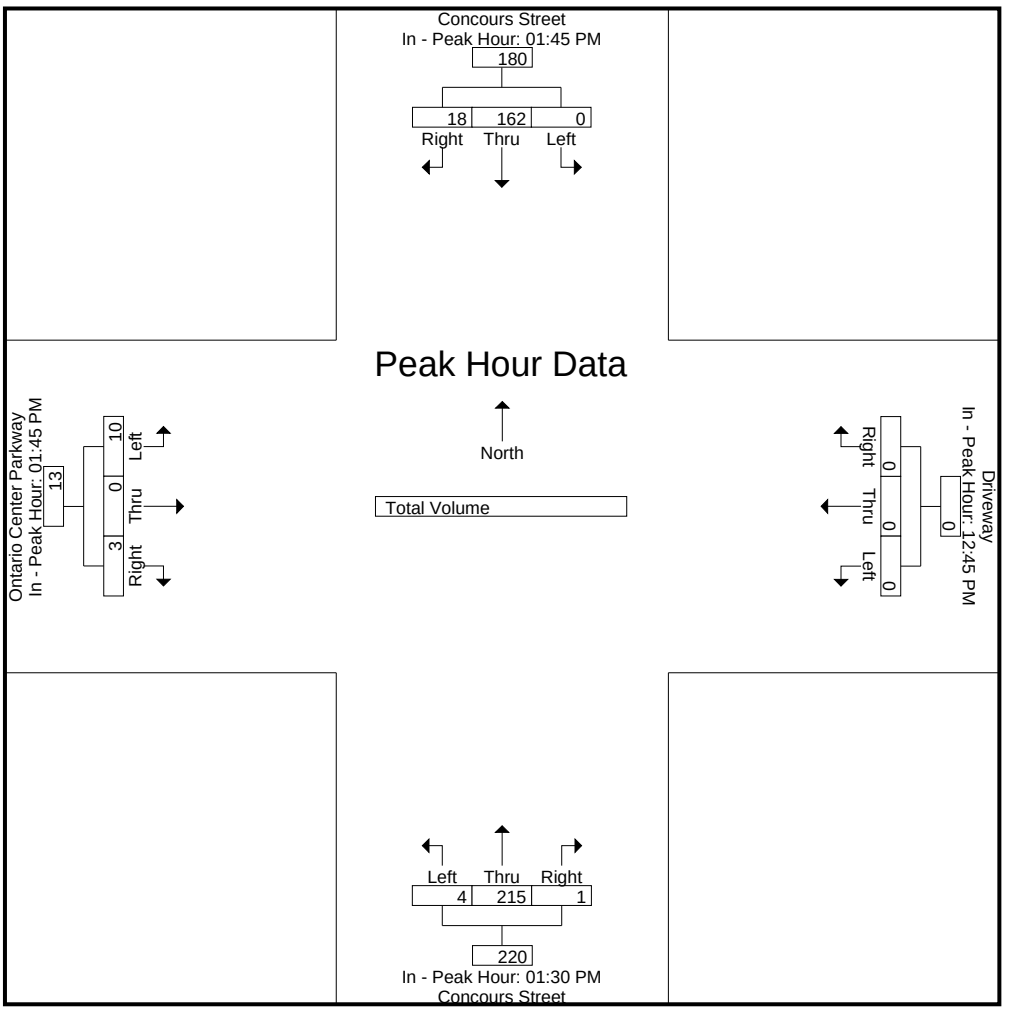
Weather: Clear

File Name : 09_ONT_Ont Ctr_Concours Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 3



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City of Ontario
N/S: Milliken Avenue
E/W: Concours Street
Weather: Clear

File Name : 10_ONT_Milliken_Concours Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 1

Groups Printed- Total Volume

	Milliken Avenue Southbound				Concours Street Westbound				Milliken Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
12:45 PM	67	190	48	305	30	18	19	67	41	197	46	284	46	20	28	94	750
Total	67	190	48	305	30	18	19	67	41	197	46	284	46	20	28	94	750
01:00 PM	48	132	36	216	37	13	28	78	46	164	47	257	49	16	33	98	649
01:15 PM	57	201	48	306	39	18	32	89	37	216	45	298	51	23	28	102	795
01:30 PM	49	175	41	265	45	18	25	88	41	157	41	239	39	31	34	104	696
01:45 PM	45	167	38	250	52	16	33	101	41	189	44	274	60	35	40	135	760
Total	199	675	163	1037	173	65	118	356	165	726	177	1068	199	105	135	439	2900
02:00 PM	48	169	40	257	49	20	24	93	39	147	43	229	64	22	26	112	691
02:15 PM	51	171	33	255	53	22	37	112	49	190	38	277	39	17	35	91	735
02:30 PM	44	203	49	296	49	20	23	92	42	193	36	271	39	22	32	93	752
Grand Total	409	1408	333	2150	354	145	221	720	336	1453	340	2129	387	186	256	829	5828
Apprch %	19	65.5	15.5		49.2	20.1	30.7		15.8	68.2	16		46.7	22.4	30.9		
Total %	7	24.2	5.7	36.9	6.1	2.5	3.8	12.4	5.8	24.9	5.8	36.5	6.6	3.2	4.4	14.2	

	Milliken Avenue Southbound				Concours Street Westbound				Milliken Avenue Northbound				Concours Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:15 PM																	
01:15 PM	**57**	**201**	**48**	**306**	39	18	32	89	37	**216**	**45**	**298**	51	23	28	102	**795**
01:30 PM	49	175	41	265	45	18	25	88	**41**	157	41	239	39	31	34	104	696
01:45 PM	45	167	38	250	**52**	16	**33**	**101**	41	189	44	274	60	**35**	**40**	**135**	760
02:00 PM	48	169	40	257	49	**20**	24	93	39	147	43	229	**64**	22	26	112	691
Total Volume	199	712	167	1078	185	72	114	371	158	709	173	1040	214	111	128	453	2942
% App. Total	18.5	66	15.5		49.9	19.4	30.7		15.2	68.2	16.6		47.2	24.5	28.3		
PHF	.873	.886	.870	.881	.889	.900	.864	.918	.963	.821	.961	.872	.836	.793	.800	.839	.925

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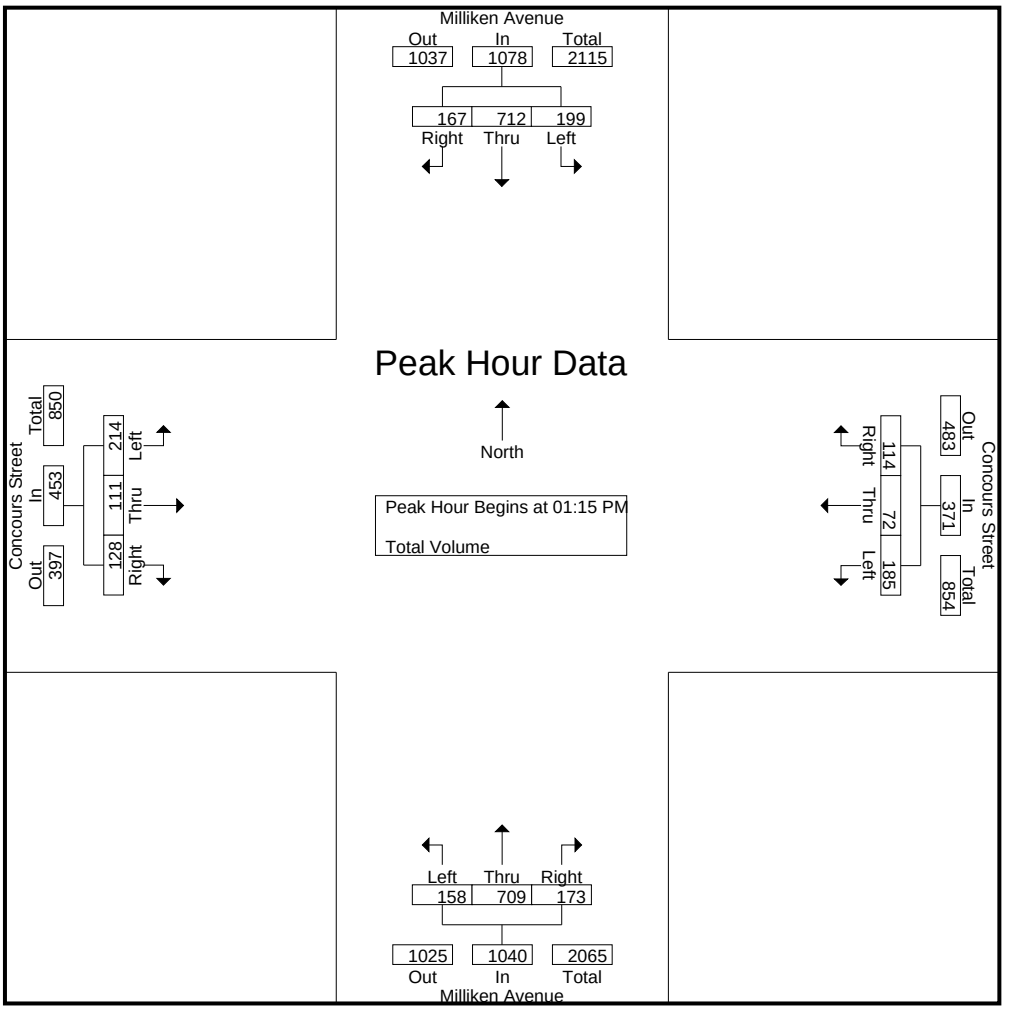
City of Ontario
N/S: Milliken Avenue
E/W: Concours Street
Weather: Clear

File Name : 10_ONT_Milliken_Concours Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 2



Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:45 PM				01:45 PM				12:45 PM				01:15 PM			
+0 mins.	**67**	190	**48**	305	52	16	33	101	41	197	46	284	51	23	28	102
+15 mins.	48	132	36	216	49	20	24	93	**46**	164	**47**	257	39	31	34	104
+30 mins.	57	**201**	48	**306**	**53**	**22**	**37**	**112**	37	**216**	45	**298**	60	**35**	**40**	**135**
+45 mins.	49	175	41	265	49	20	23	92	41	157	41	239	**64**	22	26	112
Total Volume	221	698	173	1092	203	78	117	398	165	734	179	1078	214	111	128	453
% App. Total	20.2	63.9	15.8		51	19.6	29.4		15.3	68.1	16.6		47.2	24.5	28.3	
PHF	.825	.868	.901	.892	.958	.886	.791	.888	.897	.850	.952	.904	.836	.793	.800	.839

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City of Ontario
N/S: Haven Avenue
E/W: Inland Empire Boulevard
Weather: Clear

File Name : 11_ONT_Haven_Inland Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 1

Groups Printed- Total Volume

	Haven Avenue Southbound				Inland Empire Boulevard Westbound				Haven Avenue Northbound				Inland Empire Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
12:45 PM	10	222	9	241	29	16	4	49	23	332	99	454	11	33	43	87	831
Total	10	222	9	241	29	16	4	49	23	332	99	454	11	33	43	87	831
01:00 PM	11	252	5	268	38	23	5	66	31	306	116	453	13	21	65	99	886
01:15 PM	12	269	9	290	27	13	13	53	31	285	100	416	11	24	41	76	835
01:30 PM	11	291	9	311	30	27	12	69	33	299	96	428	15	26	41	82	890
01:45 PM	5	241	10	256	39	25	20	84	25	309	92	426	12	18	39	69	835
Total	39	1053	33	1125	134	88	50	272	120	1199	404	1723	51	89	186	326	3446
02:00 PM	9	222	9	240	34	21	10	65	37	292	102	431	18	27	47	92	828
02:15 PM	8	258	13	279	35	27	16	78	33	284	82	399	10	23	45	78	834
02:30 PM	7	264	11	282	30	22	9	61	35	290	91	416	22	22	49	93	852
Grand Total	73	2019	75	2167	262	174	89	525	248	2397	778	3423	112	194	370	676	6791
Apprch %	3.4	93.2	3.5		49.9	33.1	17		7.2	70	22.7		16.6	28.7	54.7		
Total %	1.1	29.7	1.1	31.9	3.9	2.6	1.3	7.7	3.7	35.3	11.5	50.4	1.6	2.9	5.4	10	

	Haven Avenue Southbound				Inland Empire Boulevard Westbound				Haven Avenue Northbound				Inland Empire Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:00 PM																	
01:00 PM	11	252	5	268	38	23	5	66	31	306	**116**	**453**	13	21	**65**	**99**	886
01:15 PM	**12**	269	9	290	27	13	13	53	31	285	100	416	11	24	41	76	835
01:30 PM	11	**291**	9	**311**	30	**27**	12	69	**33**	299	96	428	**15**	**26**	41	82	**890**
01:45 PM	5	241	**10**	256	**39**	25	**20**	**84**	25	**309**	92	426	12	18	39	69	835
Total Volume	39	1053	33	1125	134	88	50	272	120	1199	404	1723	51	89	186	326	3446
% App. Total	3.5	93.6	2.9		49.3	32.4	18.4		7	69.6	23.4		15.6	27.3	57.1		
PHF	.813	.905	.825	.904	.859	.815	.625	.810	.909	.970	.871	.951	.850	.856	.715	.823	.968

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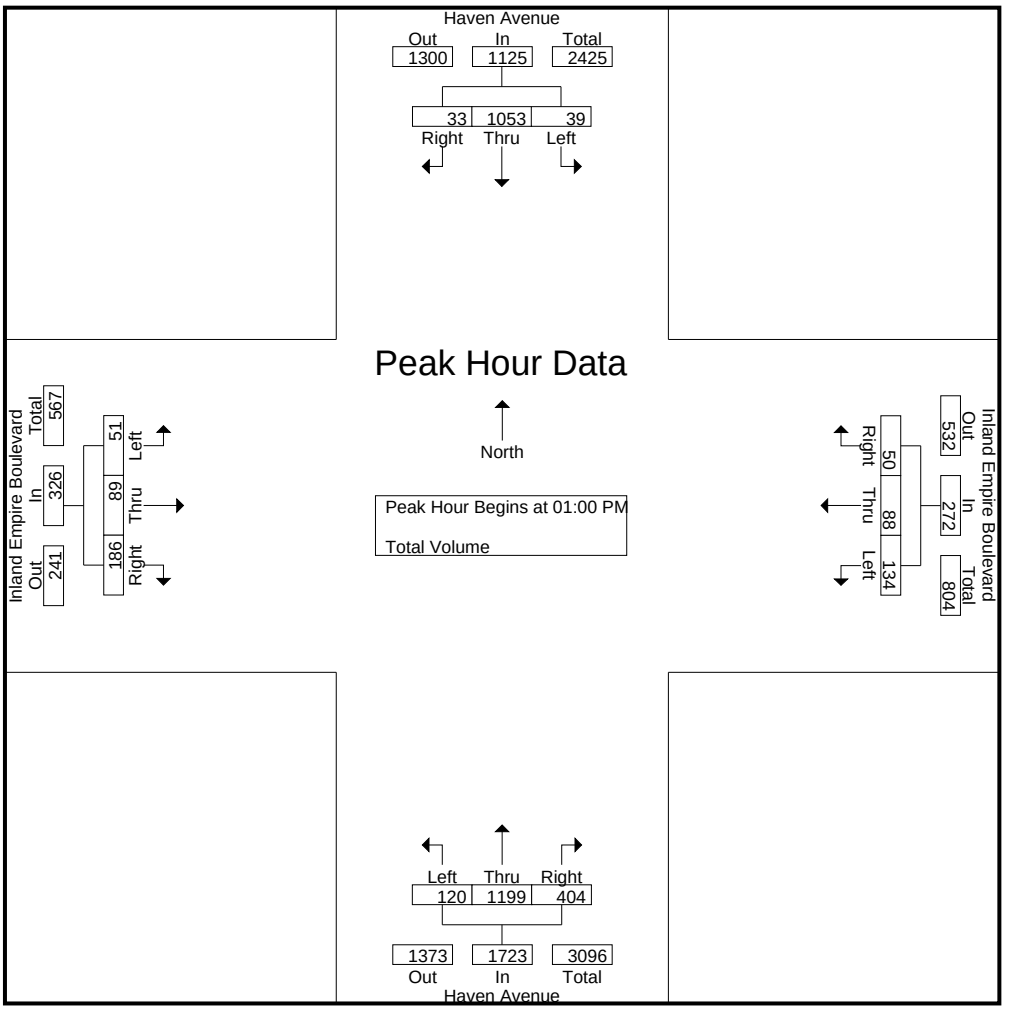
City of Ontario
N/S: Haven Avenue
E/W: Inland Empire Boulevard
Weather: Clear

File Name : 11_ONT_Haven_Inland Sat
Site Code : 10521235
Start Date : 6/5/2021



Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	01:00 PM				01:30 PM				12:45 PM				12:45 PM			
+0 mins.	11	252	5	268	30	**27**	12	69	23	**332**	99	**454**	11	**33**	43	87
+15 mins.	**12**	269	9	290	**39**	25	**20**	**84**	31	306	**116**	453	13	21	**65**	**99**
+30 mins.	11	**291**	9	**311**	34	21	10	65	31	285	100	416	11	24	41	76
+45 mins.	5	241	**10**	256	35	27	16	78	**33**	299	96	428	**15**	26	41	82
Total Volume	39	1053	33	1125	138	100	58	296	118	1222	411	1751	50	104	190	344
% App. Total	3.5	93.6	2.9		46.6	33.8	19.6		6.7	69.8	23.5		14.5	30.2	55.2	
PHF	.813	.905	.825	.904	.885	.926	.725	.881	.894	.920	.886	.964	.833	.788	.731	.869

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City of Ontario
N/S: Milliken Avenue
E/W: Inland Empire Blvd/Mall Drive
Weather: Clear

File Name : 12_ONT_Milliken_Inland Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 1

Groups Printed- Total Volume

	Milliken Avenue Southbound				Mall Drive Westbound				Milliken Avenue Northbound				Inland Empire Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
12:45 PM	27	212	16	255	48	21	21	90	42	210	150	402	31	48	42	121	868
Total	27	212	16	255	48	21	21	90	42	210	150	402	31	48	42	121	868
01:00 PM	17	216	20	253	59	13	23	95	58	216	128	402	45	66	43	154	904
01:15 PM	26	205	19	250	62	19	31	112	73	198	133	404	38	66	47	151	917
01:30 PM	23	261	18	302	68	33	23	124	60	183	157	400	34	48	45	127	953
01:45 PM	25	246	22	293	64	24	13	101	53	209	139	401	26	47	48	121	916
Total	91	928	79	1098	253	89	90	432	244	806	557	1607	143	227	183	553	3690
02:00 PM	27	232	21	280	61	23	30	114	61	199	134	394	29	50	53	132	920
02:15 PM	18	225	16	259	69	22	20	111	64	188	130	382	34	43	36	113	865
02:30 PM	18	277	18	313	60	16	16	92	39	234	139	412	38	41	41	120	937
Grand Total	181	1874	150	2205	491	171	177	839	450	1637	1110	3197	275	409	355	1039	7280
Apprch %	8.2	85	6.8		58.5	20.4	21.1		14.1	51.2	34.7		26.5	39.4	34.2		
Total %	2.5	25.7	2.1	30.3	6.7	2.3	2.4	11.5	6.2	22.5	15.2	43.9	3.8	5.6	4.9	14.3	

	Milliken Avenue Southbound				Mall Drive Westbound				Milliken Avenue Northbound				Inland Empire Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:15 PM																	
01:15 PM	26	205	19	250	62	19	**31**	112	**73**	198	133	**404**	**38**	**66**	47	**151**	917
01:30 PM	23	**261**	18	**302**	**68**	**33**	23	**124**	60	183	**157**	400	34	48	45	127	**953**
01:45 PM	25	246	**22**	293	64	24	13	101	53	**209**	139	401	26	47	48	121	916
02:00 PM	**27**	232	21	280	61	23	30	114	61	199	134	394	29	50	**53**	132	920
Total Volume	101	944	80	1125	255	99	97	451	247	789	563	1599	127	211	193	531	3706
% App. Total	9	83.9	7.1		56.5	22	21.5		15.4	49.3	35.2		23.9	39.7	36.3		
PHF	.935	.904	.909	.931	.938	.750	.782	.909	.846	.944	.896	.989	.836	.799	.910	.879	.972

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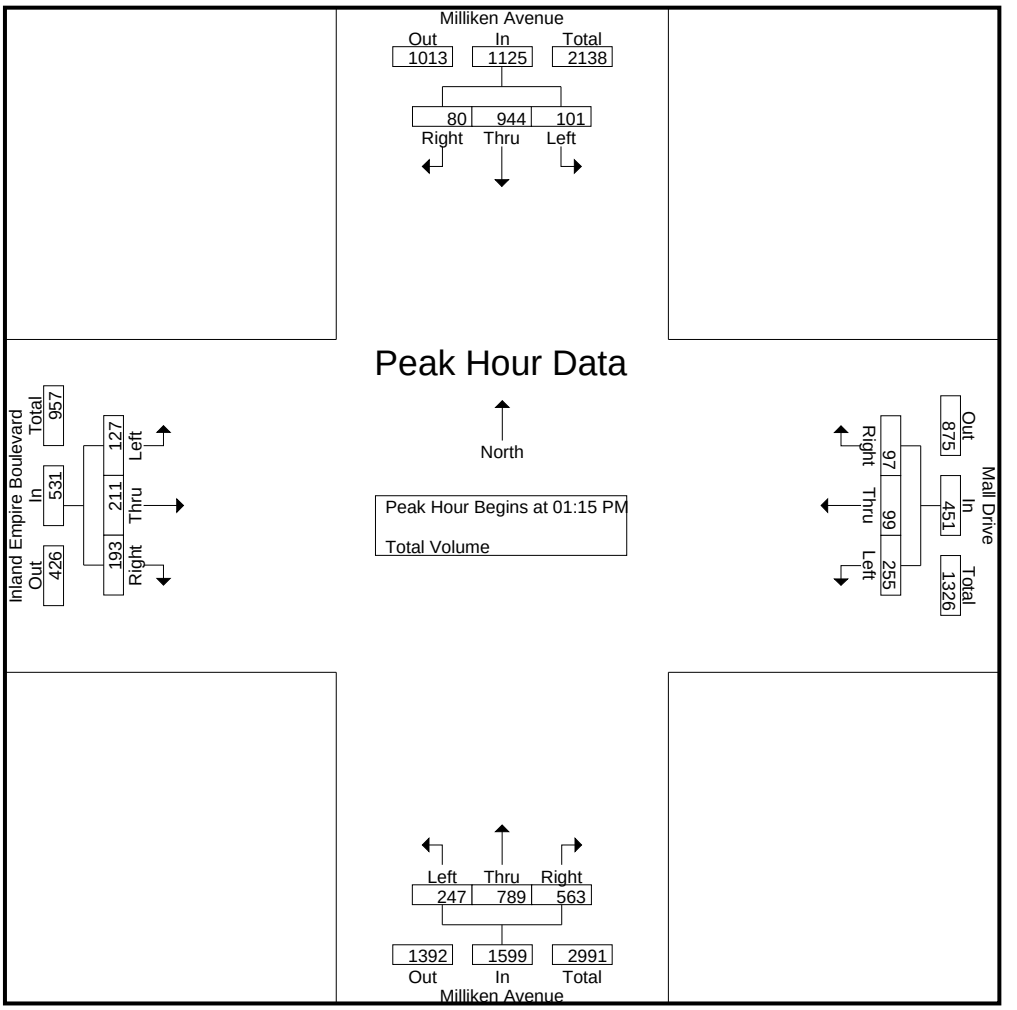
City of Ontario
N/S: Milliken Avenue
E/W: Inland Empire Blvd/Mall Drive
Weather: Clear

File Name : 12_ONT_Milliken_Inland Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 2



Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	01:45 PM				01:15 PM				12:45 PM				12:45 PM			
+0 mins.	25	246	**22**	293	62	19	**31**	112	42	210	150	402	31	48	42	121
+15 mins.	**27**	232	21	280	**68**	**33**	23	**124**	58	**216**	128	402	**45**	**66**	43	**154**
+30 mins.	18	225	16	259	64	24	13	101	**73**	198	133	**404**	38	66	**47**	151
+45 mins.	18	**277**	18	**313**	61	23	30	114	60	183	**157**	400	34	48	45	127
Total Volume	88	980	77	1145	255	99	97	451	233	807	568	1608	148	228	177	553
% App. Total	7.7	85.6	6.7		56.5	22	21.5		14.5	50.2	35.3		26.8	41.2	32	
PHF	.815	.884	.875	.915	.938	.750	.782	.909	.798	.934	.904	.995	.822	.864	.941	.898

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City of Ontario
N/S: Haven Avenue
E/W: I-10 Westbound Ramps
Weather: Clear

File Name : 13_ONT_Haven_10W Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 1

Groups Printed- Total Volume

	Haven Avenue Southbound				I-10 Westbound Ramps Westbound				Haven Avenue Northbound				I-10 Westbound On Ramp Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
12:45 PM	0	235	95	330	39	0	82	121	0	360	100	460	0	0	0	0	911
Total	0	235	95	330	39	0	82	121	0	360	100	460	0	0	0	0	911
01:00 PM	0	217	145	362	42	0	94	136	0	340	113	453	0	0	0	0	951
01:15 PM	0	255	112	367	35	0	95	130	0	306	116	422	0	0	0	0	919
01:30 PM	0	260	121	381	47	0	74	121	0	336	110	446	0	0	0	0	948
01:45 PM	0	188	135	323	48	0	80	128	0	371	94	465	0	0	0	0	916
Total	0	920	513	1433	172	0	343	515	0	1353	433	1786	0	0	0	0	3734
02:00 PM	0	218	116	334	45	0	86	131	0	340	83	423	0	0	0	0	888
02:15 PM	0	237	120	357	48	0	73	121	0	304	88	392	0	0	0	0	870
02:30 PM	0	215	132	347	44	0	80	124	0	321	98	419	0	0	0	0	890
Grand Total	0	1825	976	2801	348	0	664	1012	0	2678	802	3480	0	0	0	0	7293
Apprch %	0	65.2	34.8		34.4	0	65.6		0	77	23		0	0	0		
Total %	0	25	13.4	38.4	4.8	0	9.1	13.9	0	36.7	11	47.7	0	0	0	0	

	Haven Avenue Southbound				I-10 Westbound Ramps Westbound				Haven Avenue Northbound				I-10 Westbound On Ramp Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:00 PM																	
01:00 PM	0	217	**145**	362	42	0	94	**136**	0	340	113	453	0	0	0	0	**951**
01:15 PM	0	255	112	367	35	0	**95**	130	0	306	**116**	422	0	0	0	0	919
01:30 PM	0	**260**	121	**381**	47	0	74	121	0	336	110	446	0	0	0	0	948
01:45 PM	0	188	135	323	**48**	0	80	128	0	**371**	94	**465**	0	0	0	0	916
Total Volume	0	920	513	1433	172	0	343	515	0	1353	433	1786	0	0	0	0	3734
% App. Total	0	64.2	35.8		33.4	0	66.6		0	75.8	24.2		0	0	0		
PHF	.000	.885	.884	.940	.896	.000	.903	.947	.000	.912	.933	.960	.000	.000	.000	.000	.982

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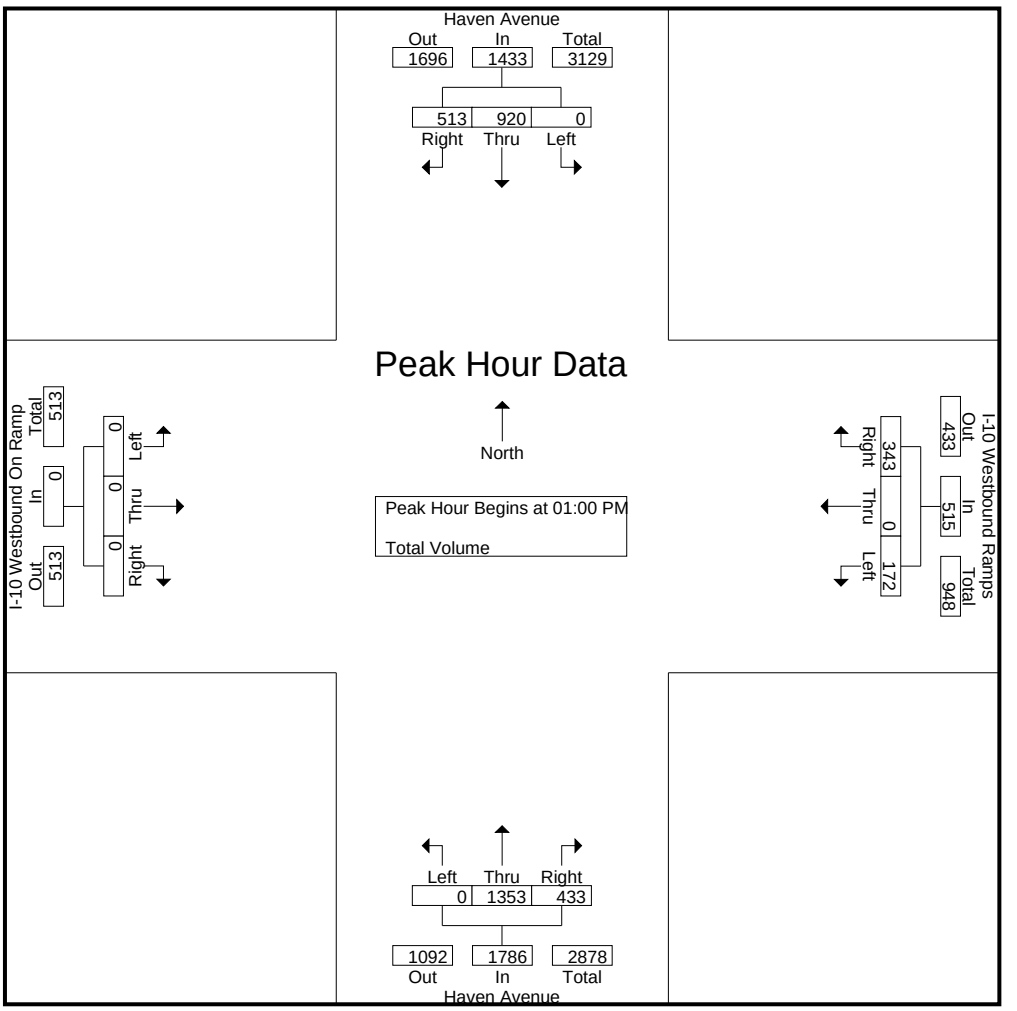
City of Ontario
N/S: Haven Avenue
E/W: I-10 Westbound Ramps
Weather: Clear

File Name : 13_ONT_Haven_10W Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 2



Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:45 PM				01:00 PM				01:00 PM				12:45 PM			
+0 mins.	0	235	95	330	42	0	94	**136**	0	340	113	453	0	0	0	0
+15 mins.	0	217	**145**	362	35	0	**95**	130	0	306	**116**	422	0	0	0	0
+30 mins.	0	255	112	367	47	0	74	121	0	336	110	446	0	0	0	0
+45 mins.	0	**260**	121	**381**	**48**	0	80	128	0	**371**	94	**465**	0	0	0	0
Total Volume	0	967	473	1440	172	0	343	515	0	1353	433	1786	0	0	0	0
% App. Total	0	67.2	32.8		33.4	0	66.6		0	75.8	24.2		0	0	0	
PHF	.000	.930	.816	.945	.896	.000	.903	.947	.000	.912	.933	.960	.000	.000	.000	.000

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City of Ontario
N/S: Milliken Avenue
E/W: I-10 WB Ramps/Ontario Mills Parkway
Weather: Clear

File Name : 14_ONT_Milliken_10W Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 1

Groups Printed- Total Volume

	Milliken Avenue Southbound				Ontario Mills Parkway Westbound				Milliken Avenue Northbound				I-10 Westbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
12:45 PM	54	151	112	317	45	44	13	102	23	235	90	348	118	52	25	195	962
Total	54	151	112	317	45	44	13	102	23	235	90	348	118	52	25	195	962
01:00 PM	56	186	120	362	57	43	22	122	34	244	84	362	99	47	25	171	1017
01:15 PM	51	173	96	320	56	57	17	130	29	234	77	340	110	43	23	176	966
01:30 PM	59	194	172	425	58	57	17	132	40	250	80	370	119	31	31	181	1108
01:45 PM	56	183	130	369	34	67	23	124	34	238	73	345	89	58	18	165	1003
Total	222	736	518	1476	205	224	79	508	137	966	314	1417	417	179	97	693	4094
02:00 PM	55	156	123	334	50	52	20	122	30	240	75	345	115	39	16	170	971
02:15 PM	46	178	141	365	54	69	13	136	45	232	70	347	116	34	27	177	1025
02:30 PM	58	191	146	395	58	54	18	130	35	261	69	365	117	35	20	172	1062
Grand Total	435	1412	1040	2887	412	443	143	998	270	1934	618	2822	883	339	185	1407	8114
Apprch %	15.1	48.9	36		41.3	44.4	14.3		9.6	68.5	21.9		62.8	24.1	13.1		
Total %	5.4	17.4	12.8	35.6	5.1	5.5	1.8	12.3	3.3	23.8	7.6	34.8	10.9	4.2	2.3	17.3	

	Milliken Avenue Southbound				Ontario Mills Parkway Westbound				Milliken Avenue Northbound				I-10 Westbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:30 PM																	
01:30 PM	**59**	**194**	**172**	**425**	**58**	57	17	132	40	**250**	**80**	**370**	**119**	31	**31**	**181**	**1108**
01:45 PM	56	183	130	369	34	67	**23**	124	34	238	73	345	89	**58**	18	165	1003
02:00 PM	55	156	123	334	50	52	20	122	30	240	75	345	115	39	16	170	971
02:15 PM	46	178	141	365	54	**69**	13	**136**	**45**	232	70	347	116	34	27	177	1025
Total Volume	216	711	566	1493	196	245	73	514	149	960	298	1407	439	162	92	693	4107
% App. Total	14.5	47.6	37.9		38.1	47.7	14.2		10.6	68.2	21.2		63.3	23.4	13.3		
PHF	.915	.916	.823	.878	.845	.888	.793	.945	.828	.960	.931	.951	.922	.698	.742	.957	.927

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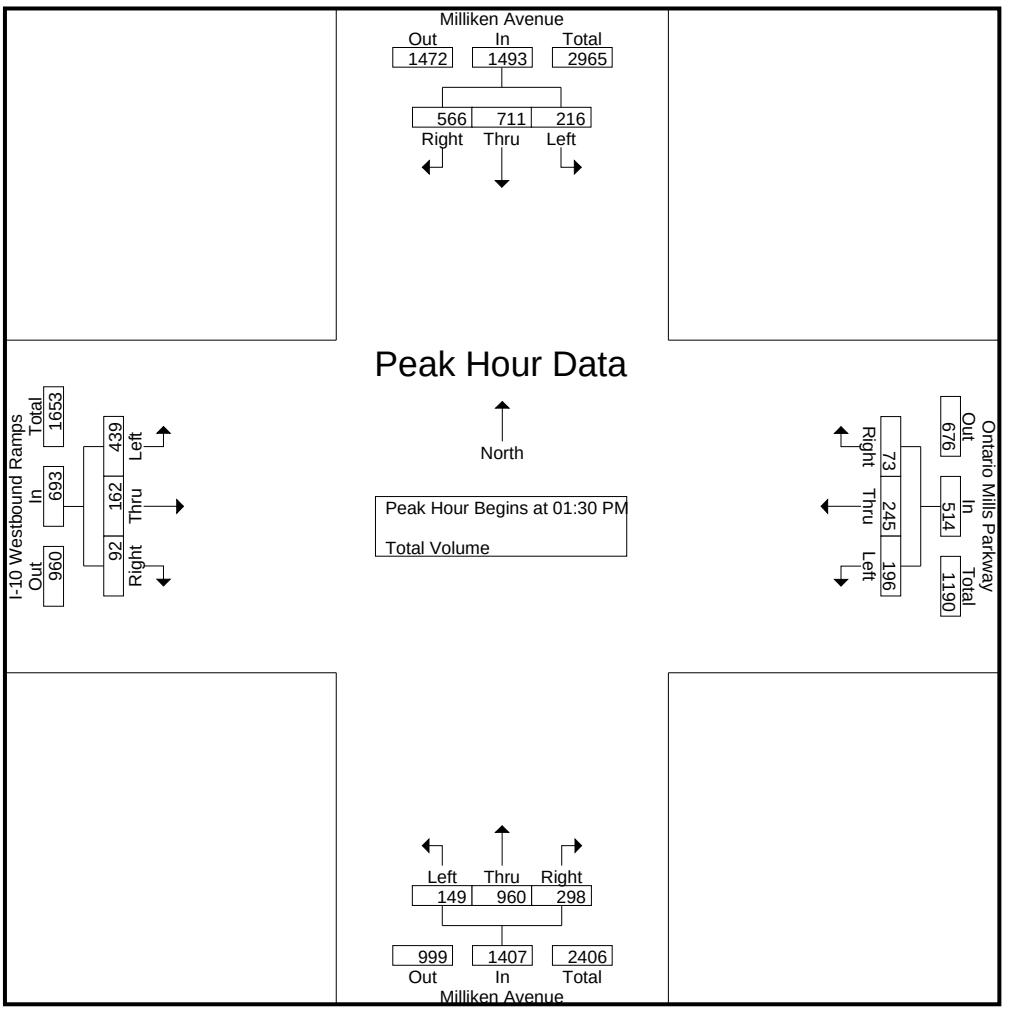
City of Ontario
N/S: Milliken Avenue
E/W: I-10 WB Ramps/Ontario Mills Parkway
Weather: Clear

File Name : 14_ONT_Milliken_10W Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 2



Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	01:30 PM				01:30 PM				12:45 PM				12:45 PM			
+0 mins.	**59**	**194**	**172**	**425**	**58**	57	17	132	23	235	**90**	348	118	**52**	25	**195**
+15 mins.	56	183	130	369	34	67	**23**	124	34	244	84	362	99	47	25	171
+30 mins.	55	156	123	334	50	52	20	122	29	234	77	340	110	43	23	176
+45 mins.	46	178	141	365	54	**69**	13	**136**	**40**	**250**	80	**370**	**119**	31	**31**	181
Total Volume	216	711	566	1493	196	245	73	514	126	963	331	1420	446	173	104	723
% App. Total	14.5	47.6	37.9		38.1	47.7	14.2		8.9	67.8	23.3		61.7	23.9	14.4	
PHF	.915	.916	.823	.878	.845	.888	.793	.945	.788	.963	.919	.959	.937	.832	.839	.927

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City of Ontario
N/S: Haven Avenue
E/W: I-10 Eastbound Ramps
Weather: Clear

File Name : 15_ONT_Haven_10E Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 1

Groups Printed- Total Volume

	Haven Avenue Southbound				I-10 Eastbound On Ramp Westbound				Haven Avenue Northbound				I-10 Eastbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
12:45 PM	0	182	58	240	0	0	0	0	0	260	55	315	189	0	83	272	827
Total	0	182	58	240	0	0	0	0	0	260	55	315	189	0	83	272	827
01:00 PM	0	220	82	302	0	0	0	0	0	252	67	319	188	0	104	292	913
01:15 PM	0	205	69	274	0	0	0	0	0	250	62	312	174	0	108	282	868
01:30 PM	0	219	70	289	0	0	0	0	0	261	56	317	178	0	85	263	869
01:45 PM	0	219	62	281	0	0	0	0	0	290	70	360	169	0	84	253	894
Total	0	863	283	1146	0	0	0	0	0	1053	255	1308	709	0	381	1090	3544
02:00 PM	0	196	67	263	0	0	0	0	0	261	63	324	151	0	73	224	811
02:15 PM	0	220	62	282	0	0	0	0	0	226	60	286	148	0	99	247	815
02:30 PM	0	205	62	267	0	0	0	0	0	256	70	326	160	0	102	262	855
Grand Total	0	1666	532	2198	0	0	0	0	0	2056	503	2559	1357	0	738	2095	6852
Apprch %	0	75.8	24.2		0	0	0		0	80.3	19.7		64.8	0	35.2		
Total %	0	24.3	7.8	32.1	0	0	0	0	0	30	7.3	37.3	19.8	0	10.8	30.6	

	Haven Avenue Southbound				I-10 Eastbound On Ramp Westbound				Haven Avenue Northbound				I-10 Eastbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:00 PM																	
01:00 PM	0	**220**	**82**	**302**	0	0	0	0	0	252	67	319	**188**	0	104	**292**	**913**
01:15 PM	0	205	69	274	0	0	0	0	0	250	62	312	174	0	**108**	282	868
01:30 PM	0	219	70	289	0	0	0	0	0	261	56	317	178	0	85	263	869
01:45 PM	0	219	62	281	0	0	0	0	0	**290**	**70**	**360**	169	0	84	253	894
Total Volume	0	863	283	1146	0	0	0	0	0	1053	255	1308	709	0	381	1090	3544
% App. Total	0	75.3	24.7		0	0	0		0	80.5	19.5		65	0	35		
PHF	.000	.981	.863	.949	.000	.000	.000	.000	.000	.908	.911	.908	.943	.000	.882	.933	.970

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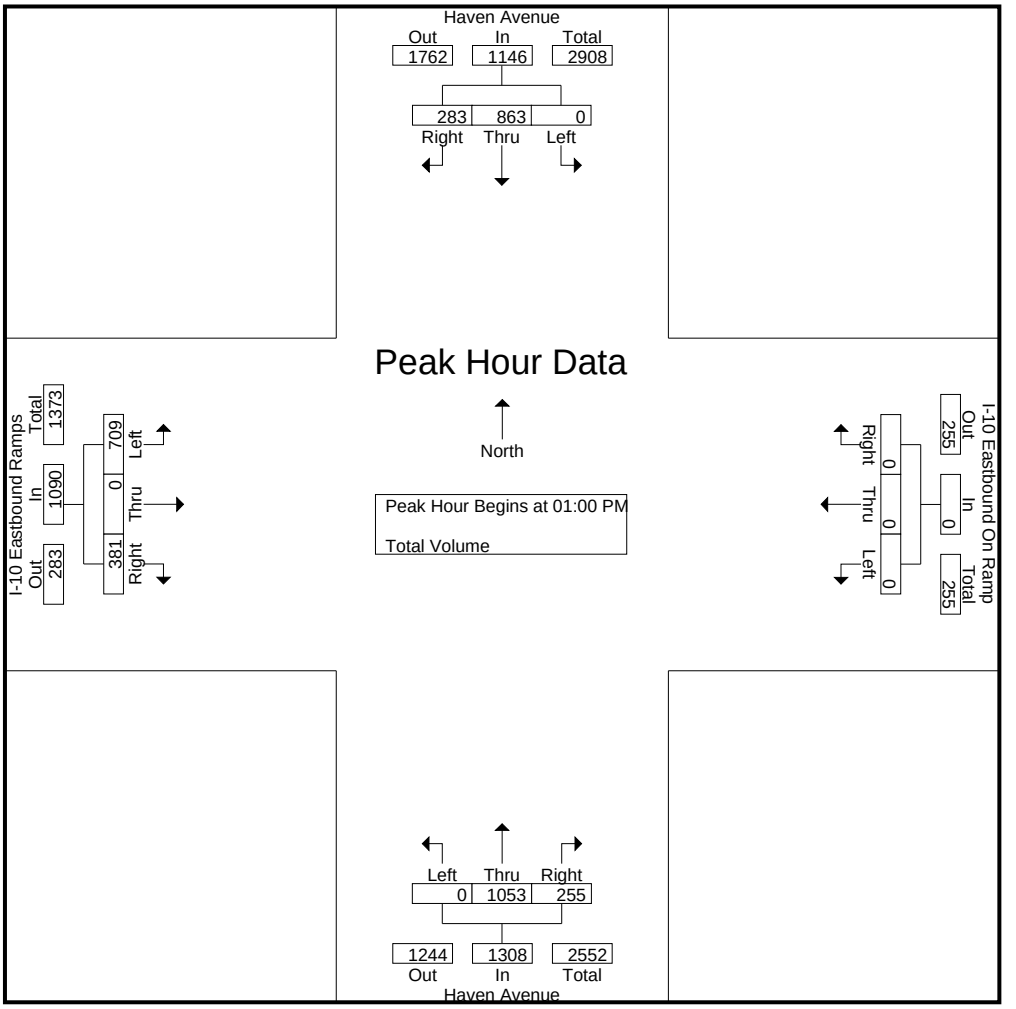
City of Ontario
N/S: Haven Avenue
E/W: I-10 Eastbound Ramps
Weather: Clear

File Name : 15_ONT_Haven_10E Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 2



Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	01:00 PM				12:45 PM				01:15 PM				12:45 PM			
+0 mins.	0	**220**	**82**	**302**	0	0	0	0	0	250	62	312	**189**	0	83	272
+15 mins.	0	205	69	274	0	0	0	0	0	261	56	317	188	0	104	**292**
+30 mins.	0	219	70	289	0	0	0	0	0	**290**	**70**	**360**	174	0	**108**	282
+45 mins.	0	219	62	281	0	0	0	0	0	261	63	324	178	0	85	263
Total Volume	0	863	283	1146	0	0	0	0	0	1062	251	1313	729	0	380	1109
% App. Total	0	75.3	24.7		0	0	0		0	80.9	19.1		65.7	0	34.3	
PHF	.000	.981	.863	.949	.000	.000	.000	.000	.000	.916	.896	.912	.964	.000	.880	.949

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City of Ontario
N/S: Milliken Avenue
E/W: I-10 Eastbound Ramps
Weather: Clear

File Name : 16_ONT_Milliken_10E Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 1

Groups Printed- Total Volume

	Milliken Avenue Southbound				Dead End Westbound				Milliken Avenue Northbound				I-10 Eastbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
12:45 PM	0	141	100	241	0	0	0	0	26	204	0	230	153	0	41	194	665
Total	0	141	100	241	0	0	0	0	26	204	0	230	153	0	41	194	665
01:00 PM	0	124	122	246	0	0	0	0	18	228	0	246	161	0	49	210	702
01:15 PM	0	150	124	274	0	0	0	0	37	178	0	215	180	0	33	213	702
01:30 PM	0	144	87	231	0	0	0	0	22	206	0	228	158	0	36	194	653
01:45 PM	0	175	92	267	0	0	0	0	35	201	0	236	130	0	39	169	672
Total	0	593	425	1018	0	0	0	0	112	813	0	925	629	0	157	786	2729
02:00 PM	0	130	116	246	0	0	0	0	25	190	0	215	138	0	24	162	623
02:15 PM	0	143	124	267	0	0	0	0	23	201	0	224	157	0	30	187	678
02:30 PM	0	161	122	283	0	0	0	0	25	211	0	236	164	0	33	197	716
Grand Total	0	1168	887	2055	0	0	0	0	211	1619	0	1830	1241	0	285	1526	5411
Apprch %	0	56.8	43.2		0	0	0		11.5	88.5	0		81.3	0	18.7		
Total %	0	21.6	16.4	38	0	0	0	0	3.9	29.9	0	33.8	22.9	0	5.3	28.2	

	Milliken Avenue Southbound				Dead End Westbound				Milliken Avenue Northbound				I-10 Eastbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:00 PM																	
01:00 PM	0	124	122	246	0	0	0	0	18	**228**	0	**246**	161	0	**49**	210	**702**
01:15 PM	0	150	**124**	**274**	0	0	0	0	**37**	178	0	215	**180**	0	33	**213**	702
01:30 PM	0	144	87	231	0	0	0	0	22	206	0	228	158	0	36	194	653
01:45 PM	0	**175**	92	267	0	0	0	0	35	201	0	236	130	0	39	169	672
Total Volume	0	593	425	1018	0	0	0	0	112	813	0	925	629	0	157	786	2729
% App. Total	0	58.3	41.7		0	0	0		12.1	87.9	0		80	0	20		
PHF	.000	.847	.857	.929	.000	.000	.000	.000	.757	.891	.000	.940	.874	.000	.801	.923	.972

Counts Unlimited, Inc.
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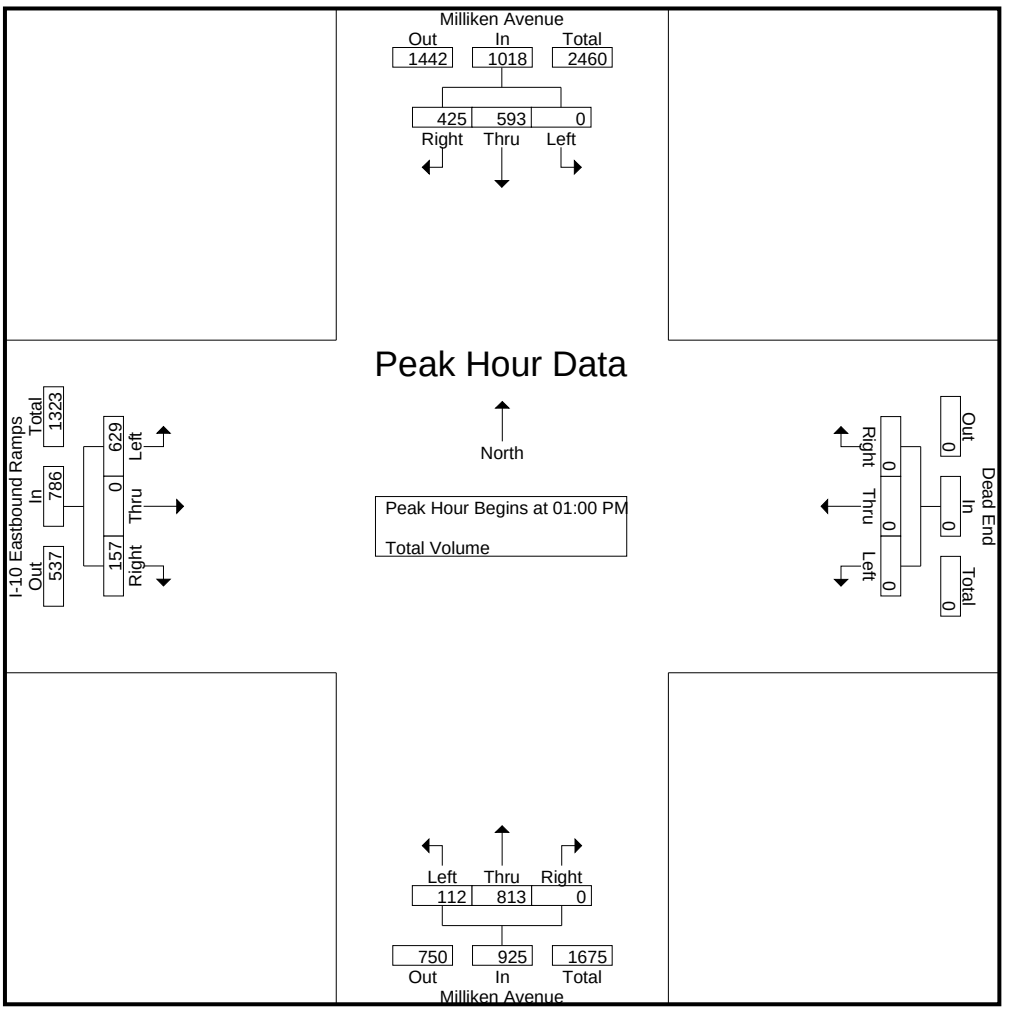
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Ontario
N/S: Milliken Avenue
E/W: I-10 Eastbound Ramps
Weather: Clear

File Name : 16_ONT_Milliken_10E Sat
Site Code : 10521235
Start Date : 6/5/2021
Page No : 2

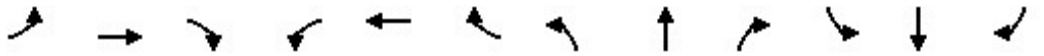


Peak Hour Analysis From 12:45 PM to 02:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	01:45 PM				12:45 PM				01:00 PM				12:45 PM			
+0 mins.	0	**175**	92	267	0	0	0	0	18	**228**	0	**246**	153	0	41	194
+15 mins.	0	130	116	246	0	0	0	0	**37**	178	0	215	161	0	**49**	210
+30 mins.	0	143	**124**	267	0	0	0	0	22	206	0	228	**180**	0	33	**213**
+45 mins.	0	161	122	**283**	0	0	0	0	35	201	0	236	158	0	36	194
Total Volume	0	609	454	1063	0	0	0	0	112	813	0	925	652	0	159	811
% App. Total	0	57.3	42.7		0	0	0		12.1	87.9	0		80.4	0	19.6	
PHF	.000	.870	.915	.939	.000	.000	.000	.000	.757	.891	.000	.940	.906	.000	.811	.952

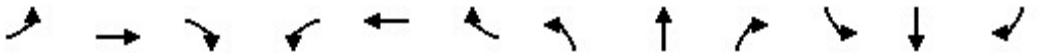
Appendix B

Intersection LOS Analysis Sheets
Existing Conditions



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.962				0.850			0.850		0.994	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4635	0	2891	3353	1500	2891	4818	1500	2891	6034	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4635	0	2891	3353	1500	2891	4818	1500	2891	6034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		67				149			238		9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



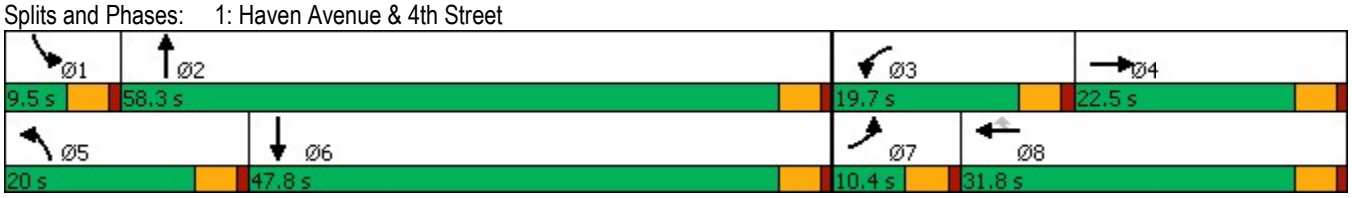
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	89	288	98	235	502	127	201	1479	464	85	1186	53
Future Volume (vph)	89	288	98	235	502	127	201	1479	464	85	1186	53
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	98	316	108	258	552	140	221	1625	510	93	1303	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	424	0	258	552	140	221	1625	510	93	1361	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	89	288	235	502	127	201	1479	464	85	1186
Future Volume (vph)	89	288	235	502	127	201	1479	464	85	1186
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	10.4	22.5	19.7	31.8	31.8	20.0	58.3		9.5	47.8
Total Split (%)	9.5%	20.5%	17.9%	28.9%	28.9%	18.2%	53.0%		8.6%	43.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	5.9	15.4	13.5	23.0	23.0	12.9	53.9	105.9	5.0	46.0
Actuated g/C Ratio	0.06	0.15	0.13	0.22	0.22	0.12	0.51	1.00	0.05	0.43
v/c Ratio	0.61	0.58	0.70	0.76	0.32	0.63	0.66	0.34	0.68	0.52
Control Delay	66.5	38.8	55.3	45.9	6.8	52.7	21.4	0.6	75.8	23.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.5	38.8	55.3	45.9	6.8	52.7	21.4	0.6	75.8	23.5
LOS	E	D	E	D	A	D	C	A	E	C
Approach Delay		44.0		42.7			19.8			26.8
Approach LOS		D		D			B			C

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 105.9	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 28.3	Intersection LOS: C
Intersection Capacity Utilization 68.1%	ICU Level of Service C
Analysis Period (min) 15	

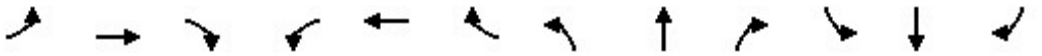
Splits and Phases: 1: Haven Avenue & 4th Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	98	424	258	552	140	221	1625	510	93	1361
v/c Ratio	0.61	0.58	0.70	0.76	0.32	0.63	0.66	0.34	0.68	0.52
Control Delay	66.5	38.8	55.3	45.9	6.8	52.7	21.4	0.6	75.8	23.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.5	38.8	55.3	45.9	6.8	52.7	21.4	0.6	75.8	23.5
Queue Length 50th (ft)	34	84	87	185	0	74	294	0	32	195
Queue Length 95th (ft)	#71	120	134	246	43	115	368	0	#76	251
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	161	845	415	866	498	424	2452	1500	136	2625
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.50	0.62	0.64	0.28	0.52	0.66	0.34	0.68	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



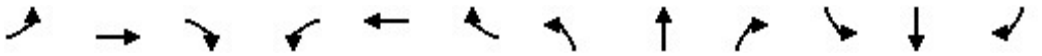
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	288	98	235	502	127	201	1479	464	85	1186	53
Future Volume (veh/h)	89	288	98	235	502	127	201	1479	464	85	1186	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	98	316	108	258	552	140	221	1625	0	93	1303	58
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	144	520	168	318	686	306	282	2536		138	2860	127
Arrive On Green	0.05	0.14	0.14	0.11	0.20	0.20	0.10	0.52	0.00	0.05	0.47	0.47
Sat Flow, veh/h	2910	3616	1170	2910	3367	1502	2910	4837	1502	2910	6027	268
Grp Volume(v), veh/h	98	280	144	258	552	140	221	1625	0	93	988	373
Grp Sat Flow(s),veh/h/ln	1455	1612	1561	1455	1683	1502	1455	1612	1502	1455	1524	1724
Q Serve(g_s), s	3.4	8.4	8.9	8.9	16.0	8.4	7.6	24.7	0.0	3.2	14.9	14.9
Cycle Q Clear(g_c), s	3.4	8.4	8.9	8.9	16.0	8.4	7.6	24.7	0.0	3.2	14.9	14.9
Prop In Lane	1.00		0.75	1.00		1.00	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	144	463	224	318	686	306	282	2536		138	2169	818
V/C Ratio(X)	0.68	0.60	0.64	0.81	0.81	0.46	0.78	0.64		0.68	0.46	0.46
Avail Cap(c_a), veh/h	167	566	274	431	895	399	439	2536		142	2169	818
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.0	41.2	41.5	44.7	38.9	35.9	45.3	17.5	0.0	48.1	18.1	18.1
Incr Delay (d2), s/veh	8.8	1.3	3.6	8.2	4.1	1.1	4.8	1.3	0.0	11.6	0.7	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	3.4	3.6	3.5	6.9	3.1	2.9	9.0	0.0	1.4	5.2	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.8	42.5	45.1	52.8	43.1	37.0	50.1	18.8	0.0	59.7	18.8	19.9
LnGrp LOS	E	D	D	D	D	D	D	B		E	B	B
Approach Vol, veh/h		522			950			1846	A		1454	
Approach Delay, s/veh		45.9			44.8			22.5			21.7	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.4	58.3	15.7	19.3	14.5	53.2	9.6	25.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	53.8	15.2	18.0	15.5	43.3	5.9	27.3
Max Q Clear Time (g_c+I1), s	5.2	26.7	10.9	10.9	9.6	16.9	5.4	18.0
Green Ext Time (p_c), s	0.0	14.7	0.3	1.5	0.4	11.0	0.0	2.9

Intersection Summary	
HCM 6th Ctrl Delay	29.3
HCM 6th LOS	C

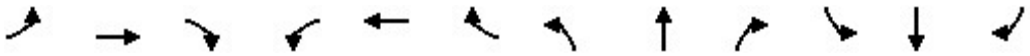
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.994				0.850			0.850		0.850	
Flt Protected	0.950			0.950			0.950					
Satd. Flow (prot)	1583	6034	0	1583	4818	1500	1583	1765	1500	1667	2850	0
Flt Permitted	0.950			0.950			0.950					
Satd. Flow (perm)	1583	6034	0	1583	4818	1500	1583	1765	1500	1667	2850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11				164			164		436	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	37	476	20	1	656	54	3	1	1	0	0	3
Future Volume (vph)	37	476	20	1	656	54	3	1	1	0	0	3
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	41	529	22	1	729	60	3	1	1	0	0	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	551	0	1	729	60	3	1	1	0	3	0

Intersection Summary

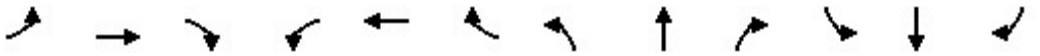
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBT	Ø1
Lane Configurations										
Traffic Volume (vph)	37	476	1	656	54	3	1	1	0	
Future Volume (vph)	37	476	1	656	54	3	1	1	0	
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	NA	
Protected Phases	7	4	3	8		5	2		6	1
Permitted Phases					8			2		
Detector Phase	7	4	3	8	8	5	2	2	6	
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	22.5	9.5
Total Split (s)	9.5	22.5	9.5	22.5	22.5	11.3	23.0	23.0	26.7	15.0
Total Split (%)	13.6%	32.1%	13.6%	32.1%	32.1%	16.1%	32.9%	32.9%	38.1%	21%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	Min	Min	None
Act Effct Green (s)	5.5	13.2	5.5	13.2	13.2	6.1	7.3	7.3	6.0	
Actuated g/C Ratio	0.18	0.42	0.18	0.42	0.42	0.19	0.23	0.23	0.19	
v/c Ratio	0.15	0.22	0.00	0.36	0.08	0.01	0.00	0.00	0.00	
Control Delay	17.4	6.9	17.0	7.9	0.2	16.3	12.0	0.0	0.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	17.4	6.9	17.0	7.9	0.2	16.3	12.0	0.0	0.0	
LOS	B	A	B	A	A	B	B	A	A	
Approach Delay		7.7		7.3			12.2			
Approach LOS		A		A			B			

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 31.4	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.36	
Intersection Signal Delay: 7.5	Intersection LOS: A
Intersection Capacity Utilization 33.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	41	551	1	729	60	3	1	1	3
v/c Ratio	0.15	0.22	0.00	0.36	0.08	0.01	0.00	0.00	0.00
Control Delay	17.4	6.9	17.0	7.9	0.2	16.3	12.0	0.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.4	6.9	17.0	7.9	0.2	16.3	12.0	0.0	0.0
Queue Length 50th (ft)	5	10	0	18	0	0	0	0	0
Queue Length 95th (ft)	36	50	4	90	0	7	3	0	0
Internal Link Dist (ft)		2546		362			269		358
Turn Bay Length (ft)	130		130		145	165		165	
Base Capacity (vph)	274	3775	274	3010	999	373	1133	1022	2296
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.15	0.00	0.24	0.06	0.01	0.00	0.00	0.00

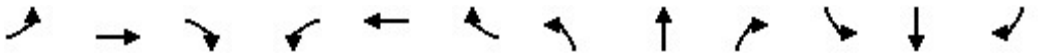
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	476	20	1	656	54	3	1	1	0	0	3
Future Volume (veh/h)	37	476	20	1	656	54	3	1	1	0	0	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	41	529	22	1	729	60	3	1	1	0	0	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	75	2068	85	5	1434	445	7	485	411	5	239	213
Arrive On Green	0.05	0.34	0.34	0.00	0.30	0.30	0.00	0.27	0.27	0.00	0.00	0.14
Sat Flow, veh/h	1594	6050	249	1594	4837	1502	1594	1772	1502	1594	1683	1502
Grp Volume(v), veh/h	41	398	153	1	729	60	3	1	1	0	0	3
Grp Sat Flow(s),veh/h/ln	1594	1524	1727	1594	1612	1502	1594	1772	1502	1594	1683	1502
Q Serve(g_s), s	0.9	2.2	2.2	0.0	4.4	1.0	0.1	0.0	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.9	2.2	2.2	0.0	4.4	1.0	0.1	0.0	0.0	0.0	0.0	0.1
Prop In Lane	1.00		0.14	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	75	1563	590	5	1434	445	7	485	411	5	239	213
V/C Ratio(X)	0.55	0.25	0.26	0.22	0.51	0.13	0.46	0.00	0.00	0.00	0.00	0.01
Avail Cap(c_a), veh/h	226	2335	882	226	2471	767	308	930	788	475	1060	946
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	16.4	8.4	8.4	17.6	10.3	9.1	17.5	9.3	9.3	0.0	0.0	13.0
Incr Delay (d2), s/veh	6.1	0.1	0.2	22.9	0.3	0.1	42.8	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.5	0.6	0.0	1.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.6	8.4	8.6	40.5	10.6	9.2	60.3	9.3	9.3	0.0	0.0	13.0
LnGrp LOS	C	A	A	D	B	A	E	A	A	A	A	B
Approach Vol, veh/h		592			790			5			3	
Approach Delay, s/veh		9.5			10.5			39.9			13.0	
Approach LOS		A			B			D			B	

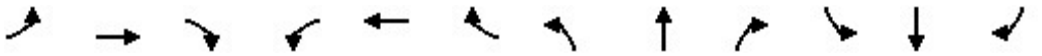
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	0.0	14.1	4.5	16.5	4.6	9.5	6.2	14.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	18.5	5.0	18.0	6.8	22.2	5.0	18.0
Max Q Clear Time (g_c+I1), s	0.0	2.0	2.0	4.2	2.1	2.1	2.9	6.4
Green Ext Time (p_c), s	0.0	0.0	0.0	3.0	0.0	0.0	0.0	4.0

Intersection Summary	
HCM 6th Ctrl Delay	10.2
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.996				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.956	
Satd. Flow (prot)	2891	6065	0	1583	4798	0	1583	1765	1500	0	1687	1500
Flt Permitted	0.950			0.950			0.732				0.741	
Satd. Flow (perm)	2891	6065	0	1583	4798	0	1220	1765	1500	0	1308	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			7				109			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



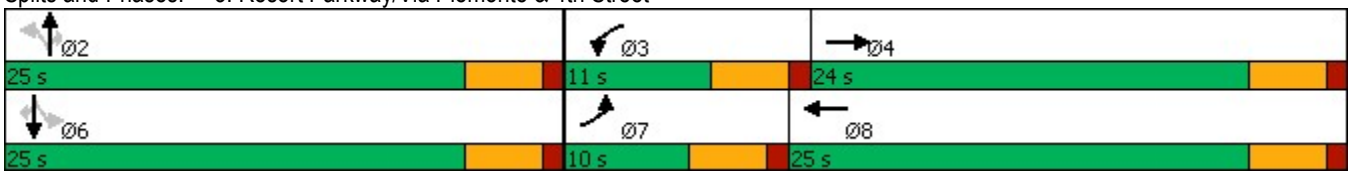
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	14	472	4	15	675	19	8	3	11	33	3	16
Future Volume (vph)	14	472	4	15	675	19	8	3	11	33	3	16
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	15	508	4	16	726	20	9	3	12	35	3	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	15	512	0	16	746	0	9	3	12	0	38	17

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	14	472	15	675	8	3	11	33	3	16
Future Volume (vph)	14	472	15	675	8	3	11	33	3	16
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8		2			6	
Permitted Phases					2		2	6		6
Detector Phase	7	4	3	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	10.0	24.0	11.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (%)	16.7%	40.0%	18.3%	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	5.9	11.9	6.2	12.0	6.7	6.7	6.7		6.7	6.7
Actuated g/C Ratio	0.20	0.40	0.21	0.41	0.23	0.23	0.23		0.23	0.23
v/c Ratio	0.03	0.21	0.05	0.38	0.03	0.01	0.03		0.13	0.04
Control Delay	14.1	6.6	13.7	7.2	12.8	12.7	0.1		13.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	14.1	6.6	13.7	7.2	12.8	12.7	0.1		13.2	0.2
LOS	B	A	B	A	B	B	A		B	A
Approach Delay		6.8		7.4		6.4			9.2	
Approach LOS		A		A		A			A	

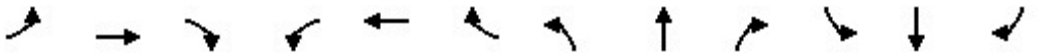
Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 29.6	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.38	
Intersection Signal Delay: 7.2	Intersection LOS: A
Intersection Capacity Utilization 33.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	15	512	16	746	9	3	12	38	17
v/c Ratio	0.03	0.21	0.05	0.38	0.03	0.01	0.03	0.13	0.04
Control Delay	14.1	6.6	13.7	7.2	12.8	12.7	0.1	13.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	6.6	13.7	7.2	12.8	12.7	0.1	13.2	0.2
Queue Length 50th (ft)	1	10	2	20	1	0	0	4	0
Queue Length 95th (ft)	8	39	16	71	11	6	0	28	0
Internal Link Dist (ft)		362		428		302		378	
Turn Bay Length (ft)	220		125		115		115		110
Base Capacity (vph)	571	4251	369	3537	898	1300	1133	963	1133
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.12	0.04	0.21	0.01	0.00	0.01	0.04	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	472	4	15	675	19	8	3	11	33	3	16
Future Volume (veh/h)	14	472	4	15	675	19	8	3	11	33	3	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	15	508	4	16	726	20	9	3	12	35	3	17
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	57	2108	17	33	1629	45	451	308	261	461	29	261
Arrive On Green	0.02	0.34	0.34	0.02	0.34	0.34	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	2910	6285	49	1594	4840	133	1315	1772	1502	1265	169	1502
Grp Volume(v), veh/h	15	369	143	16	483	263	9	3	12	38	0	17
Grp Sat Flow(s),veh/h/ln	1455	1524	1763	1594	1612	1748	1315	1772	1502	1434	0	1502
Q Serve(g_s), s	0.1	1.7	1.7	0.3	3.4	3.4	0.2	0.0	0.2	0.4	0.0	0.3
Cycle Q Clear(g_c), s	0.1	1.7	1.7	0.3	3.4	3.4	0.8	0.0	0.2	0.6	0.0	0.3
Prop In Lane	1.00		0.03	1.00		0.08	1.00		1.00	0.92		1.00
Lane Grp Cap(c), veh/h	57	1534	591	33	1086	589	451	308	261	490	0	261
V/C Ratio(X)	0.26	0.24	0.24	0.48	0.45	0.45	0.02	0.01	0.05	0.08	0.00	0.07
Avail Cap(c_a), veh/h	557	3102	1196	360	2300	1247	1160	1264	1071	1257	0	1071
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.9	6.9	6.9	13.9	7.4	7.4	10.4	9.8	9.9	10.0	0.0	9.9
Incr Delay (d2), s/veh	2.4	0.1	0.2	10.4	0.3	0.5	0.0	0.0	0.1	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.3	0.4	0.2	0.7	0.8	0.0	0.0	0.0	0.2	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.3	7.0	7.1	24.3	7.7	8.0	10.4	9.8	10.0	10.1	0.0	10.0
LnGrp LOS	B	A	A	C	A	A	B	A	A	B	A	B
Approach Vol, veh/h		527			762			24			55	
Approach Delay, s/veh		7.3			8.2			10.1			10.1	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	5.1	14.1		9.5	5.1	14.2				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		20.5	6.5	19.5		20.5	5.5	20.5				
Max Q Clear Time (g_c+I1), s		2.8	2.3	3.7		2.6	2.1	5.4				
Green Ext Time (p_c), s		0.0	0.0	3.0		0.2	0.0	4.3				

Intersection Summary	
HCM 6th Ctrl Delay	7.9
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.994					0.865
Flt Protected						
Satd. Flow (prot)	4789	0	0	4818	0	1526
Flt Permitted						
Satd. Flow (perm)	4789	0	0	4818	0	1526
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	508	20	0	668	0	3
Future Volume (vph)	508	20	0	668	0	3
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	552	22	0	726	0	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	574	0	0	726	0	3

Intersection Summary

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	508	20	0	668	0	3
Future Vol, veh/h	508	20	0	668	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	552	22	0	726	0	3

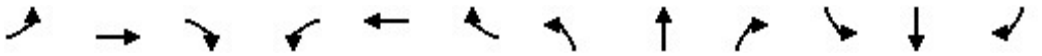
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	287
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	605
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	605
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	605	-	-	-
HCM Lane V/C Ratio	0.005	-	-	-
HCM Control Delay (s)	11	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5973	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5973	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			182			288			81		29	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



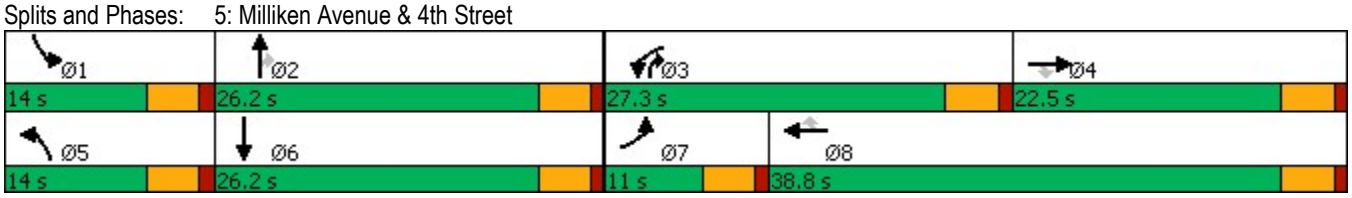
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	141	365	98	443	1132	377	191	897	140	190	785	91
Future Volume (vph)	141	365	98	443	1132	377	191	897	140	190	785	91
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	152	392	105	476	1217	405	205	965	151	204	844	98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	152	392	105	476	1217	405	205	965	151	204	942	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	141	365	98	443	1132	377	191	897	140	190	785
Future Volume (vph)	141	365	98	443	1132	377	191	897	140	190	785
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	11.0	22.5	22.5	27.3	38.8	38.8	14.0	26.2	27.3	14.0	26.2
Total Split (%)	12.2%	25.0%	25.0%	30.3%	43.1%	43.1%	15.6%	29.1%	30.3%	15.6%	29.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	6.5	19.7	19.7	19.0	32.1	32.1	9.2	20.1	43.6	9.2	20.1
Actuated g/C Ratio	0.08	0.23	0.23	0.22	0.37	0.37	0.11	0.23	0.51	0.11	0.23
v/c Ratio	0.69	0.36	0.22	0.75	0.68	0.55	0.67	0.68	0.19	0.66	0.66
Control Delay	58.1	30.2	1.4	39.3	25.0	9.4	49.6	33.1	6.0	49.4	31.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.1	30.2	1.4	39.3	25.0	9.4	49.6	33.1	6.0	49.4	31.8
LOS	E	C	A	D	C	A	D	C	A	D	C
Approach Delay		32.0			25.2			32.6			34.9
Approach LOS		C			C			C			C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 86	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 30.1	Intersection LOS: C
Intersection Capacity Utilization 63.0%	ICU Level of Service B
Analysis Period (min) 15	

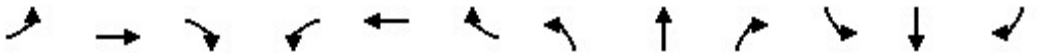
Splits and Phases: 5: Milliken Avenue & 4th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	152	392	105	476	1217	405	205	965	151	204	942
v/c Ratio	0.69	0.36	0.22	0.75	0.68	0.55	0.67	0.68	0.19	0.66	0.66
Control Delay	58.1	30.2	1.4	39.3	25.0	9.4	49.6	33.1	6.0	49.4	31.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.1	30.2	1.4	39.3	25.0	9.4	49.6	33.1	6.0	49.4	31.8
Queue Length 50th (ft)	44	68	0	130	205	44	58	144	19	58	135
Queue Length 95th (ft)	#90	101	4	177	255	126	#102	180	47	#102	171
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	219	1101	483	771	1933	774	321	1541	865	321	1538
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.36	0.22	0.62	0.63	0.52	0.64	0.63	0.17	0.64	0.61

Intersection Summary

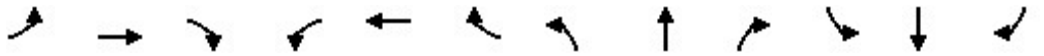
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	365	98	443	1132	377	191	897	140	190	785	91
Future Volume (veh/h)	141	365	98	443	1132	377	191	897	140	190	785	91
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	152	392	105	476	1217	405	205	965	151	204	844	98
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	216	1187	368	577	1787	555	277	1394	641	276	1276	146
Arrive On Green	0.07	0.25	0.25	0.20	0.37	0.37	0.10	0.23	0.23	0.09	0.23	0.23
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	2910	6095	1502	2910	5589	640
Grp Volume(v), veh/h	152	392	105	476	1217	405	205	965	151	204	688	254
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1455	1524	1502	1455	1524	1657
Q Serve(g_s), s	3.9	5.1	4.4	12.1	16.4	18.0	5.3	11.2	5.0	5.3	10.6	10.8
Cycle Q Clear(g_c), s	3.9	5.1	4.4	12.1	16.4	18.0	5.3	11.2	5.0	5.3	10.6	10.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.39
Lane Grp Cap(c), veh/h	216	1187	368	577	1787	555	277	1394	641	276	1044	378
V/C Ratio(X)	0.70	0.33	0.28	0.82	0.68	0.73	0.74	0.69	0.24	0.74	0.66	0.67
Avail Cap(c_a), veh/h	245	1187	368	858	2146	666	358	1711	719	358	1283	465
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.0	24.0	23.7	29.7	20.5	21.0	34.1	27.3	14.1	34.1	27.1	27.2
Incr Delay (d2), s/veh	7.6	0.2	0.4	4.2	0.7	3.3	5.9	0.9	0.2	5.8	0.9	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	1.9	1.5	4.4	5.9	6.4	2.1	4.0	1.6	2.0	3.8	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.6	24.1	24.1	33.9	21.2	24.3	39.9	28.2	14.3	39.9	28.0	29.9
LnGrp LOS	D	C	C	C	C	C	D	C	B	D	C	C
Approach Vol, veh/h		649			2098			1321			1146	
Approach Delay, s/veh		28.4			24.7			28.5			30.5	
Approach LOS		C			C			C			C	

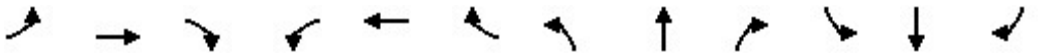
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.8	22.2	19.8	23.5	11.9	22.2	10.2	33.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	21.7	22.8	18.0	9.5	21.7	6.5	34.3
Max Q Clear Time (g_c+I1), s	7.3	13.2	14.1	7.1	7.3	12.8	5.9	20.0
Green Ext Time (p_c), s	0.1	4.5	1.2	2.2	0.1	4.1	0.0	8.6

Intersection Summary	
HCM 6th Ctrl Delay	27.4
HCM 6th LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.901	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2894	1365
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2894	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136			136			136		217	217
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



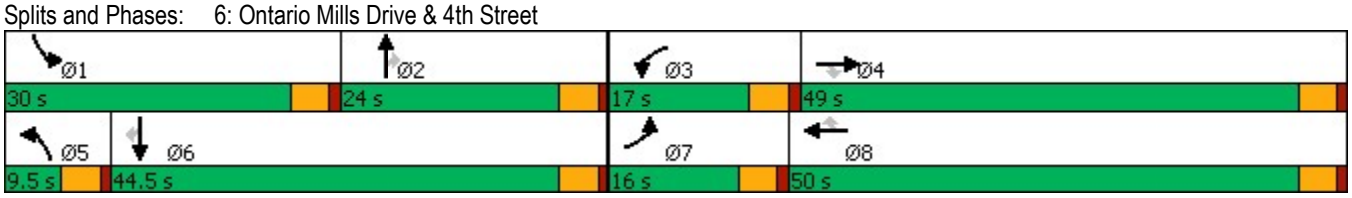
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	275	320	57	106	1243	126	69	68	75	141	214	832
Future Volume (vph)	275	320	57	106	1243	126	69	68	75	141	214	832
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	316	368	66	122	1429	145	79	78	86	162	246	956
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	316	368	66	122	1429	145	79	78	86	162	724	478

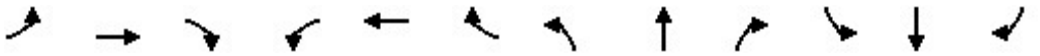
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	275	320	57	106	1243	126	69	68	75	141	214	832
Future Volume (vph)	275	320	57	106	1243	126	69	68	75	141	214	832
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	16.0	49.0	49.0	17.0	50.0	50.0	9.5	24.0	24.0	30.0	44.5	44.5
Total Split (%)	13.3%	40.8%	40.8%	14.2%	41.7%	41.7%	7.9%	20.0%	20.0%	25.0%	37.1%	37.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	11.7	43.4	43.4	9.9	41.6	41.6	5.1	20.8	20.8	16.6	32.4	32.4
Actuated g/C Ratio	0.11	0.40	0.40	0.09	0.38	0.38	0.05	0.19	0.19	0.15	0.30	0.30
v/c Ratio	1.02	0.19	0.10	0.47	0.78	0.22	1.08	0.12	0.22	0.67	0.72	0.86
Control Delay	106.2	23.1	0.3	55.7	33.9	5.8	181.1	39.7	2.8	59.2	27.8	35.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	106.2	23.1	0.3	55.7	33.9	5.8	181.1	39.7	2.8	59.2	27.8	35.6
LOS	F	C	A	E	C	A	F	D	A	E	C	D
Approach Delay		56.1			33.0			72.6			34.2	
Approach LOS		E			C			E			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 109.1	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 40.1	Intersection LOS: D
Intersection Capacity Utilization 77.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Ontario Mills Drive & 4th Street



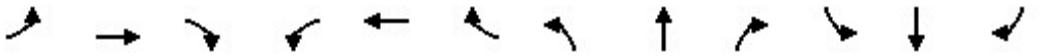


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	316	368	66	122	1429	145	79	78	86	162	724	478
v/c Ratio	1.02	0.19	0.10	0.47	0.78	0.22	1.08	0.12	0.22	0.67	0.72	0.86
Control Delay	106.2	23.1	0.3	55.7	33.9	5.8	181.1	39.7	2.8	59.2	27.8	35.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	106.2	23.1	0.3	55.7	33.9	5.8	181.1	39.7	2.8	59.2	27.8	35.6
Queue Length 50th (ft)	~142	65	0	46	342	4	~72	25	0	118	184	212
Queue Length 95th (ft)	#228	92	0	75	394	42	#169	48	8	178	241	349
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	310	2027	709	337	2048	716	73	684	414	377	1217	645
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.18	0.09	0.36	0.70	0.20	1.08	0.11	0.21	0.43	0.59	0.74

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



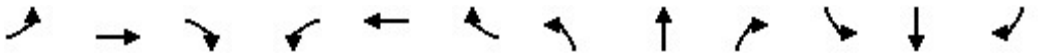
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	275	320	57	106	1243	126	69	68	75	141	214	832
Future Volume (veh/h)	275	320	57	106	1243	126	69	68	75	141	214	832
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	316	368	66	122	1429	145	79	78	86	162	246	956
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	293	1936	601	171	1734	538	70	890	397	190	602	1020
Arrive On Green	0.10	0.40	0.40	0.06	0.36	0.36	0.04	0.26	0.26	0.12	0.34	0.34
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	1594	3367	1502	1594	1772	3003
Grp Volume(v), veh/h	316	368	66	122	1429	145	79	78	86	162	246	956
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1594	1683	1502	1594	1772	1502
Q Serve(g_s), s	11.5	5.6	3.2	4.7	30.8	7.8	5.0	2.0	5.1	11.4	12.2	35.2
Cycle Q Clear(g_c), s	11.5	5.6	3.2	4.7	30.8	7.8	5.0	2.0	5.1	11.4	12.2	35.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	293	1936	601	171	1734	538	70	890	397	190	602	1020
V/C Ratio(X)	1.08	0.19	0.11	0.71	0.82	0.27	1.13	0.09	0.22	0.85	0.41	0.94
Avail Cap(c_a), veh/h	293	1936	601	318	1925	598	70	890	397	355	620	1051
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.4	22.3	21.5	52.9	33.4	26.0	54.7	31.7	32.8	49.4	28.9	36.6
Incr Delay (d2), s/veh	75.4	0.0	0.1	5.4	2.8	0.3	148.7	0.0	0.3	10.2	0.4	14.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	2.2	1.1	1.8	12.3	2.8	4.9	0.8	1.9	5.1	5.2	14.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	126.8	22.3	21.6	58.3	36.2	26.3	203.3	31.7	33.1	59.6	29.4	51.3
LnGrp LOS	F	C	C	E	D	C	F	C	C	E	C	D
Approach Vol, veh/h		750			1696			243			1364	
Approach Delay, s/veh		66.3			36.9			88.0			48.4	
Approach LOS		E			D			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.1	34.7	11.2	50.3	9.5	43.3	16.0	45.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	25.5	19.5	12.5	44.5	5.0	40.0	11.5	45.5
Max Q Clear Time (g_c+I1), s	13.4	7.1	6.7	7.6	7.0	37.2	13.5	32.8
Green Ext Time (p_c), s	0.3	0.5	0.2	2.9	0.0	1.6	0.0	8.2

Intersection Summary	
HCM 6th Ctrl Delay	49.3
HCM 6th LOS	D

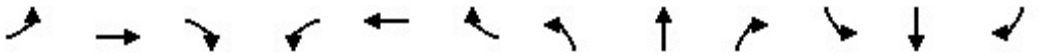
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.982			0.891				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.966	
Satd. Flow (prot)	2891	4818	1500	1583	4731	0	1583	2987	0	1504	1619	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.966	
Satd. Flow (perm)	2891	4818	1500	1583	4731	0	1583	2987	0	1504	1619	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127		24			58				521
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



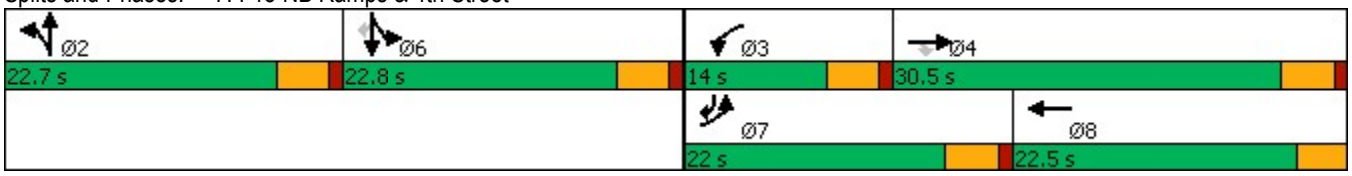
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	175	314	74	43	450	60	106	21	55	356	63	924
Future Volume (vph)	175	314	74	43	450	60	106	21	55	356	63	924
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	184	331	78	45	474	63	112	22	58	375	66	973
Shared Lane Traffic (%)										42%		
Lane Group Flow (vph)	184	331	78	45	537	0	112	80	0	217	224	973

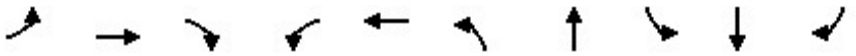
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	175	314	74	43	450	106	21	356	63	924
Future Volume (vph)	175	314	74	43	450	106	21	356	63	924
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	22.0	30.5	30.5	14.0	22.5	22.7	22.7	22.8	22.8	22.0
Total Split (%)	24.4%	33.9%	33.9%	15.6%	25.0%	25.2%	25.2%	25.3%	25.3%	24.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	12.1	22.5	22.5	7.5	13.6	10.6	10.6	14.7	14.7	31.6
Actuated g/C Ratio	0.18	0.33	0.33	0.11	0.20	0.15	0.15	0.21	0.21	0.46
v/c Ratio	0.36	0.21	0.14	0.26	0.56	0.46	0.16	0.67	0.65	0.65
Control Delay	29.3	20.1	1.8	36.6	27.4	36.0	13.4	39.0	36.7	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.3	20.1	1.8	36.6	27.4	36.0	13.4	39.0	36.7	8.9
LOS	C	C	A	D	C	D	B	D	D	A
Approach Delay		20.5			28.2		26.6		17.9	
Approach LOS		C			C		C		B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 68.8	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 21.2	Intersection LOS: C
Intersection Capacity Utilization 62.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street

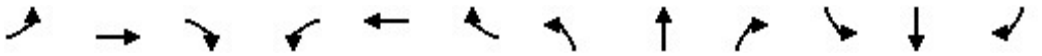




Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	184	331	78	45	537	112	80	217	224	973
v/c Ratio	0.36	0.21	0.14	0.26	0.56	0.46	0.16	0.67	0.65	0.65
Control Delay	29.3	20.1	1.8	36.6	27.4	36.0	13.4	39.0	36.7	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.3	20.1	1.8	36.6	27.4	36.0	13.4	39.0	36.7	8.9
Queue Length 50th (ft)	36	41	0	18	71	44	4	87	89	68
Queue Length 95th (ft)	75	74	11	56	127	105	24	#218	#208	169
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	767	1899	668	228	1380	436	866	417	449	1681
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.17	0.12	0.20	0.39	0.26	0.09	0.52	0.50	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	314	74	43	450	60	106	21	55	356	63	924
Future Volume (veh/h)	175	314	74	43	450	60	106	21	55	356	63	924
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	184	331	78	45	474	63	112	22	58	422	0	973
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	283	1126	350	70	779	102	176	186	166	984	0	1219
Arrive On Green	0.10	0.23	0.23	0.04	0.18	0.18	0.11	0.11	0.11	0.31	0.00	0.31
Sat Flow, veh/h	2910	4837	1502	1594	4329	566	1594	1683	1502	3188	0	3003
Grp Volume(v), veh/h	184	331	78	45	351	186	112	22	58	422	0	973
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1594	1612	1670	1594	1683	1502	1594	0	1502
Q Serve(g_s), s	3.6	3.3	2.5	1.6	5.9	6.1	4.0	0.7	2.1	6.2	0.0	16.9
Cycle Q Clear(g_c), s	3.6	3.3	2.5	1.6	5.9	6.1	4.0	0.7	2.1	6.2	0.0	16.9
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	283	1126	350	70	580	300	176	186	166	984	0	1219
V/C Ratio(X)	0.65	0.29	0.22	0.64	0.61	0.62	0.64	0.12	0.35	0.43	0.00	0.80
Avail Cap(c_a), veh/h	859	2123	659	256	1034	536	490	517	461	984	0	1219
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.8	18.7	18.4	27.9	22.4	22.4	25.2	23.8	24.4	16.3	0.0	15.5
Incr Delay (d2), s/veh	2.5	0.1	0.3	9.3	1.0	2.1	3.8	0.3	1.3	0.3	0.0	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.2	0.8	0.8	2.2	2.4	1.6	0.3	0.8	2.1	0.0	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.3	18.9	18.7	37.1	23.4	24.5	29.0	24.0	25.6	16.6	0.0	19.3
LnGrp LOS	C	B	B	D	C	C	C	C	C	B	A	B
Approach Vol, veh/h		593			582			192			1395	
Approach Delay, s/veh		21.8			24.8			27.4			18.5	
Approach LOS		C			C			C			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		11.0	7.1	18.3		22.8	10.3	15.2				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		18.2	9.5	26.0		18.3	17.5	* 19				
Max Q Clear Time (g_c+I1), s		6.0	3.6	5.3		18.9	5.6	8.1				
Green Ext Time (p_c), s		0.6	0.0	2.4		0.0	0.4	2.6				

Intersection Summary	
HCM 6th Ctrl Delay	21.1
HCM 6th LOS	C

Notes

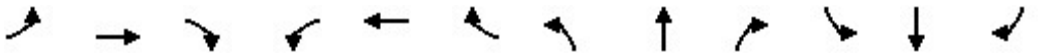
User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

User approved changes to right turn type.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.903				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3028	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3028	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		87				182			182			182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



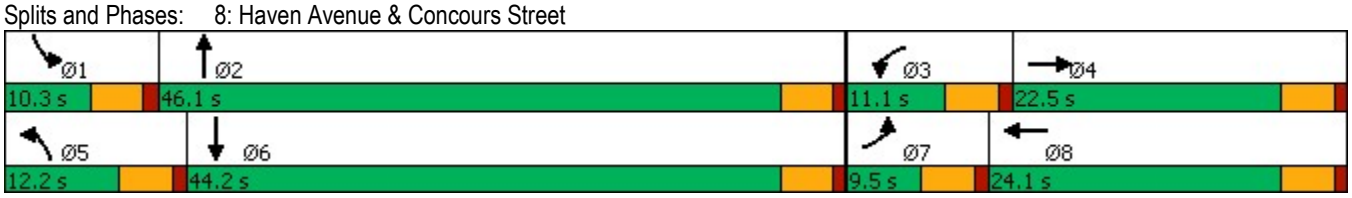
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	20	43	78	157	57	17	68	1737	131	93	1322	42
Future Volume (vph)	20	43	78	157	57	17	68	1737	131	93	1322	42
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	22	48	87	174	63	19	76	1930	146	103	1469	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	135	0	174	63	19	76	1930	146	103	1469	47

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	20	43	157	57	17	68	1737	131	93	1322	42
Future Volume (vph)	20	43	157	57	17	68	1737	131	93	1322	42
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	11.1	24.1		12.2	46.1		10.3	44.2	
Total Split (%)	10.6%	25.0%	12.3%	26.8%		13.6%	51.2%		11.4%	49.1%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.1	6.9	6.7	14.7	75.0	7.0	39.8	75.0	5.9	38.7	75.0
Actuated g/C Ratio	0.07	0.09	0.09	0.20	1.00	0.09	0.53	1.00	0.08	0.52	1.00
v/c Ratio	0.11	0.38	0.50	0.10	0.01	0.28	0.60	0.10	0.45	0.47	0.03
Control Delay	37.0	17.8	39.8	29.7	0.0	36.6	13.5	0.1	42.4	12.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	17.8	39.8	29.7	0.0	36.6	13.5	0.1	42.4	12.8	0.0
LOS	D	B	D	C	A	D	B	A	D	B	A
Approach Delay		20.5		34.3			13.4			14.4	
Approach LOS		C		C			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 75	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization 54.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	22	135	174	63	19	76	1930	146	103	1469	47
v/c Ratio	0.11	0.38	0.50	0.10	0.01	0.28	0.60	0.10	0.45	0.47	0.03
Control Delay	37.0	17.8	39.8	29.7	0.0	36.6	13.5	0.1	42.4	12.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	17.8	39.8	29.7	0.0	36.6	13.5	0.1	42.4	12.8	0.0
Queue Length 50th (ft)	5	11	29	12	0	18	177	0	25	127	0
Queue Length 95th (ft)	17	37	52	33	0	39	229	0	51	169	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	195	803	352	889	1500	301	3419	1500	227	3267	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.17	0.49	0.07	0.01	0.25	0.56	0.10	0.45	0.45	0.03

Intersection Summary

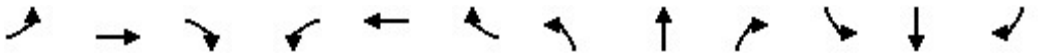
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	43	78	157	57	17	68	1737	131	93	1322	42
Future Volume (veh/h)	20	43	78	157	57	17	68	1737	131	93	1322	42
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	22	48	87	174	63	0	76	1930	0	103	1469	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	73	154	138	284	465		164	3078		185	3121	
Arrive On Green	0.03	0.09	0.09	0.07	0.14	0.00	0.06	0.50	0.00	0.06	0.51	0.00
Sat Flow, veh/h	2910	1683	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	22	48	87	174	63	0	76	1930	0	103	1469	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	0.5	1.8	3.7	2.9	1.1	0.0	1.7	15.4	0.0	2.3	10.4	0.0
Cycle Q Clear(g_c), s	0.5	1.8	3.7	2.9	1.1	0.0	1.7	15.4	0.0	2.3	10.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	73	154	138	284	465		164	3078		185	3121	
V/C Ratio(X)	0.30	0.31	0.63	0.61	0.14		0.46	0.63		0.56	0.47	
Avail Cap(c_a), veh/h	217	451	403	390	983		334	3778		251	3606	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.1	28.5	29.4	30.3	25.4	0.0	30.7	12.0	0.0	30.5	10.5	0.0
Incr Delay (d2), s/veh	2.3	1.1	4.7	2.1	0.1	0.0	2.0	0.2	0.0	2.6	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.7	1.5	0.9	0.4	0.0	0.6	4.5	0.0	0.8	3.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.4	29.6	34.1	32.4	25.5	0.0	32.7	12.3	0.0	33.1	10.6	0.0
LnGrp LOS	C	C	C	C	C		C	B		C	B	
Approach Vol, veh/h		157			237	A		2006	A		1572	A
Approach Delay, s/veh		32.8			30.6			13.0			12.1	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.8	38.4	9.3	10.7	8.3	38.9	6.2	13.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.8	41.6	6.6	18.0	7.7	39.7	5.0	19.6
Max Q Clear Time (g_c+I1), s	4.3	17.4	4.9	5.7	3.7	12.4	2.5	3.1
Green Ext Time (p_c), s	0.0	16.5	0.1	0.5	0.1	13.0	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	14.5
HCM 6th LOS	B

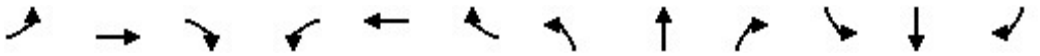
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.850			0.973			0.994			0.989	
Flt Protected					0.971		0.950			0.950		
Satd. Flow (prot)	1676	1425	0	0	1667	0	1676	4789	0	1676	4765	0
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	1676	1425	0	0	1717	0	1676	4789	0	1676	4765	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		576			1			7			16	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



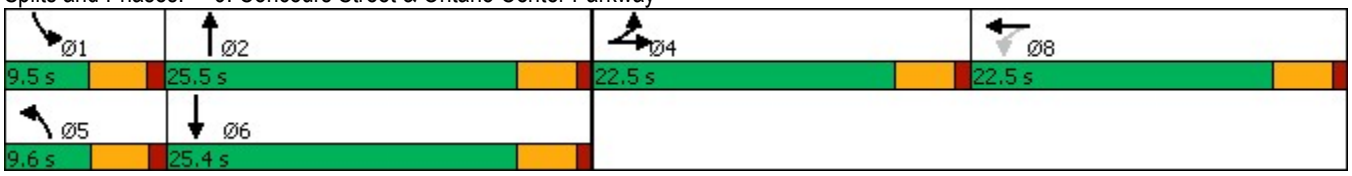
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	0	3	3	1	1	37	476	20	1	656	54
Future Volume (vph)	0	0	3	3	1	1	37	476	20	1	656	54
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	0	3	3	1	1	41	529	22	1	729	60
Shared Lane Traffic (%)	0%											
Lane Group Flow (vph)	0	3	0	0	5	0	41	551	0	1	789	0

Intersection Summary

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	0	3	1	37	476	1	656
Future Volume (vph)	0	3	1	37	476	1	656
Turn Type	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	4		8	5	2	1	6
Permitted Phases		8					
Detector Phase	4	8	8	5	2	1	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	22.5	9.6	25.5	9.5	25.4
Total Split (%)	28.1%	28.1%	28.1%	12.0%	31.9%	11.9%	31.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag				Lead	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	None	Min
Act Effct Green (s)	6.0		6.1	5.5	32.6	5.4	30.1
Actuated g/C Ratio	0.16		0.16	0.15	0.88	0.15	0.81
v/c Ratio	0.00		0.02	0.16	0.13	0.00	0.20
Control Delay	0.0		18.5	20.9	3.7	21.0	4.5
Queue Delay	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	0.0		18.5	20.9	3.7	21.0	4.5
LOS	A		B	C	A	C	A
Approach Delay			18.5		4.9		4.5
Approach LOS			B		A		A

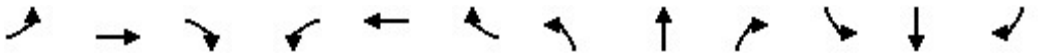
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 37.1	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.20	
Intersection Signal Delay: 4.7	Intersection LOS: A
Intersection Capacity Utilization 34.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	3	5	41	551	1	789
v/c Ratio	0.00	0.02	0.16	0.13	0.00	0.20
Control Delay	0.0	18.5	20.9	3.7	21.0	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.0	18.5	20.9	3.7	21.0	4.5
Queue Length 50th (ft)	0	1	6	0	0	0
Queue Length 95th (ft)	0	10	39	66	4	95
Internal Link Dist (ft)	319	68		111		176
Turn Bay Length (ft)			115		120	
Base Capacity (vph)	1022	903	249	4213	244	3867
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.01	0.16	0.13	0.00	0.20

Intersection Summary



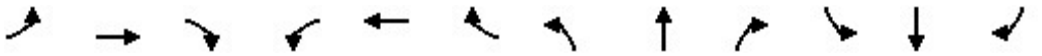
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	3	3	1	1	37	476	20	1	656	54
Future Volume (veh/h)	0	0	3	3	1	1	37	476	20	1	656	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	0	0	3	3	1	1	41	529	22	1	729	60
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	7	0	6	7	2	2	81	1864	77	6	1570	128
Arrive On Green	0.00	0.00	0.00	0.01	0.01	0.01	0.05	0.39	0.39	0.00	0.34	0.34
Sat Flow, veh/h	1688	0	1502	997	332	332	1688	4764	197	1688	4557	373
Grp Volume(v), veh/h	0	0	3	5	0	0	41	357	194	1	515	274
Grp Sat Flow(s),veh/h/ln	1688	0	1502	1662	0	0	1688	1612	1736	1688	1612	1705
Q Serve(g_s), s	0.0	0.0	0.1	0.1	0.0	0.0	0.7	2.3	2.3	0.0	3.8	3.8
Cycle Q Clear(g_c), s	0.0	0.0	0.1	0.1	0.0	0.0	0.7	2.3	2.3	0.0	3.8	3.8
Prop In Lane	1.00		1.00	0.60		0.20	1.00		0.11	1.00		0.22
Lane Grp Cap(c), veh/h	7	0	6	11	0	0	81	1262	679	6	1111	587
V/C Ratio(X)	0.00	0.00	0.49	0.44	0.00	0.00	0.50	0.28	0.29	0.18	0.46	0.47
Avail Cap(c_a), veh/h	1007	0	896	991	0	0	285	2244	1208	280	2233	1181
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	15.0	14.9	0.0	0.0	14.0	6.3	6.3	15.0	7.7	7.7
Incr Delay (d2), s/veh	0.0	0.0	49.0	24.8	0.0	0.0	4.8	0.1	0.2	14.6	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	0.1	0.0	0.0	0.3	0.5	0.5	0.0	0.8	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	64.0	39.8	0.0	0.0	18.8	6.4	6.5	29.6	8.0	8.3
LnGrp LOS	A	A	E	D	A	A	B	A	A	C	A	A
Approach Vol, veh/h		3			5			592			790	
Approach Delay, s/veh		64.0			39.8			7.3			8.1	
Approach LOS		E			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.5	16.3		4.6	6.0	14.9		4.7				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	21.0		18.0	5.1	20.9		18.0				
Max Q Clear Time (g_c+I1), s	2.0	4.3		2.1	2.7	5.8		2.1				
Green Ext Time (p_c), s	0.0	3.2		0.0	0.0	4.6		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		8.0
HCM 6th LOS		A

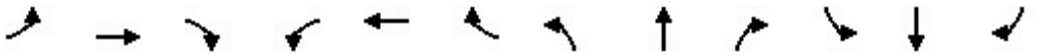
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			234			234			234			263
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



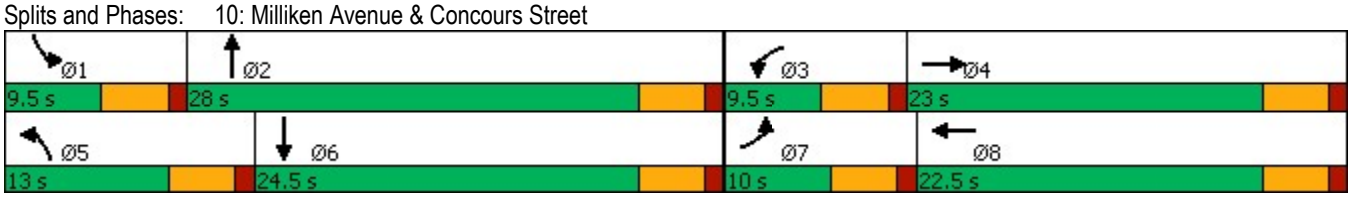
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	67	23	49	47	75	38	149	902	57	51	864	226
Future Volume (vph)	67	23	49	47	75	38	149	902	57	51	864	226
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	78	27	57	55	87	44	173	1049	66	59	1005	263
Shared Lane Traffic (%)												
Lane Group Flow (vph)	78	27	57	55	87	44	173	1049	66	59	1005	263

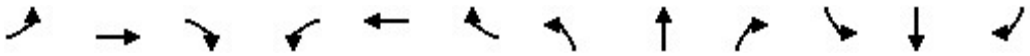
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	23	49	47	75	38	149	902	57	51	864	226
Future Volume (vph)	67	23	49	47	75	38	149	902	57	51	864	226
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	10.0	23.0		9.5	22.5		13.0	28.0		9.5	24.5	
Total Split (%)	14.3%	32.9%		13.6%	32.1%		18.6%	40.0%		13.6%	35.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	5.9	9.1	50.0	5.4	7.2	50.0	8.2	28.1	50.0	5.4	23.5	50.0
Actuated g/C Ratio	0.12	0.18	1.00	0.11	0.14	1.00	0.16	0.56	1.00	0.11	0.47	1.00
v/c Ratio	0.23	0.04	0.04	0.18	0.18	0.03	0.36	0.31	0.04	0.19	0.35	0.18
Control Delay	26.3	21.2	0.0	26.5	23.5	0.0	24.6	10.4	0.1	26.6	13.6	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.3	21.2	0.0	26.5	23.5	0.0	24.6	10.4	0.1	26.6	13.6	0.3
LOS	C	C	A	C	C	A	C	B	A	C	B	A
Approach Delay		16.2			18.8			11.8			11.6	
Approach LOS		B			B			B			B	

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 50	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.36	
Intersection Signal Delay: 12.4	Intersection LOS: B
Intersection Capacity Utilization 38.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 10: Milliken Avenue & Concours Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	78	27	57	55	87	44	173	1049	66	59	1005	263
v/c Ratio	0.23	0.04	0.04	0.18	0.18	0.03	0.36	0.31	0.04	0.19	0.35	0.18
Control Delay	26.3	21.2	0.0	26.5	23.5	0.0	24.6	10.4	0.1	26.6	13.6	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.3	21.2	0.0	26.5	23.5	0.0	24.6	10.4	0.1	26.6	13.6	0.3
Queue Length 50th (ft)	13	3	0	9	14	0	28	75	0	10	79	0
Queue Length 95th (ft)	30	13	0	23	31	0	53	99	0	25	104	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	343	1340	1500	312	1304	1500	530	3442	1500	312	3012	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.02	0.04	0.18	0.07	0.03	0.33	0.30	0.04	0.19	0.33	0.18

Intersection Summary

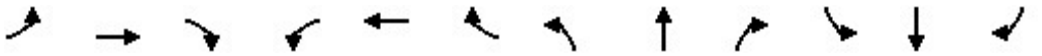
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	23	49	47	75	38	149	902	57	51	864	226
Future Volume (veh/h)	67	23	49	47	75	38	149	902	57	51	864	226
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	78	27	0	55	87	0	173	1049	0	59	1005	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	205	387		163	339		295	2151		171	1891	
Arrive On Green	0.07	0.12	0.00	0.06	0.10	0.00	0.10	0.35	0.00	0.06	0.31	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	78	27	0	55	87	0	173	1049	0	59	1005	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	1.1	0.3	0.0	0.8	1.0	0.0	2.4	5.8	0.0	0.8	5.9	0.0
Cycle Q Clear(g_c), s	1.1	0.3	0.0	0.8	1.0	0.0	2.4	5.8	0.0	0.8	5.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	205	387		163	339		295	2151		171	1891	
V/C Ratio(X)	0.38	0.07		0.34	0.26		0.59	0.49		0.35	0.53	
Avail Cap(c_a), veh/h	371	1444		337	1405		574	3322		337	2827	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.1	17.0	0.0	19.6	17.9	0.0	18.5	10.9	0.0	19.5	12.3	0.0
Incr Delay (d2), s/veh	1.2	0.1	0.0	1.2	0.4	0.0	1.9	0.2	0.0	1.2	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.1	0.0	0.3	0.4	0.0	0.8	1.6	0.0	0.3	1.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.3	17.1	0.0	20.8	18.3	0.0	20.4	11.1	0.0	20.7	12.5	0.0
LnGrp LOS	C	B		C	B		C	B		C	B	
Approach Vol, veh/h		105	A		142	A		1222	A		1064	A
Approach Delay, s/veh		19.5			19.3			12.4			13.0	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	19.7	6.9	9.5	8.9	17.9	7.5	8.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	23.5	5.0	18.5	8.5	20.0	5.5	18.0
Max Q Clear Time (g_c+I1), s	2.8	7.8	2.8	2.3	4.4	7.9	3.1	3.0
Green Ext Time (p_c), s	0.0	6.7	0.0	0.1	0.2	5.5	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	13.3
HCM 6th LOS	B

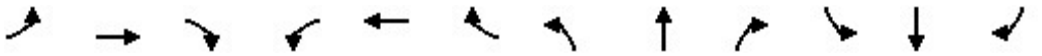
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			236			437			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



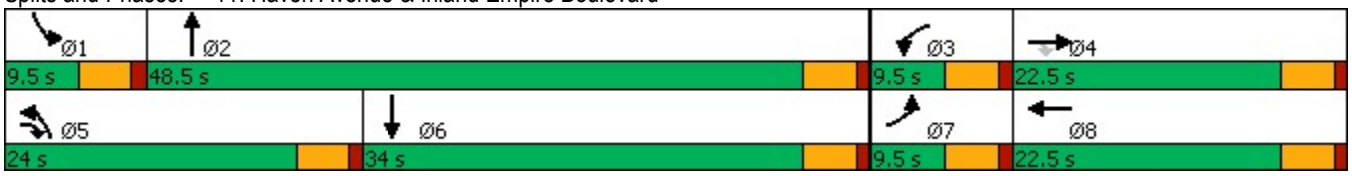
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	51	94	230	113	99	20	442	1999	622	50	1301	72
Future Volume (vph)	51	94	230	113	99	20	442	1999	622	50	1301	72
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	55	101	247	122	106	22	475	2149	669	54	1399	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	101	247	122	106	22	475	2149	669	54	1399	77

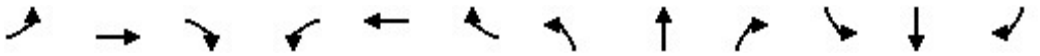
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	94	230	113	99	20	442	1999	622	50	1301	72
Future Volume (vph)	51	94	230	113	99	20	442	1999	622	50	1301	72
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	24.0	9.5	22.5		24.0	48.5		9.5	34.0	
Total Split (%)	10.6%	25.0%	26.7%	10.6%	25.0%		26.7%	53.9%		10.6%	37.8%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.4	8.1	26.6	5.4	10.0	71.0	17.3	46.6	71.0	5.4	27.8	71.0
Actuated g/C Ratio	0.08	0.11	0.37	0.08	0.14	1.00	0.24	0.66	1.00	0.08	0.39	1.00
v/c Ratio	0.25	0.26	0.41	0.41	0.23	0.01	0.67	0.54	0.45	0.25	0.59	0.05
Control Delay	39.1	34.7	14.0	40.7	33.1	0.0	32.0	10.9	1.0	39.0	20.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	34.7	14.0	40.7	33.1	0.0	32.0	10.9	1.0	39.0	20.1	0.1
LOS	D	C	B	D	C	A	C	B	A	D	C	A
Approach Delay		22.6			33.9			11.9			19.8	
Approach LOS		C			C			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 71	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 15.9	Intersection LOS: B
Intersection Capacity Utilization 55.5%	ICU Level of Service B
Analysis Period (min) 15	

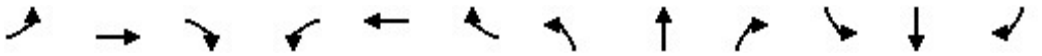
Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	55	101	247	122	106	22	475	2149	669	54	1399	77
v/c Ratio	0.25	0.26	0.41	0.41	0.23	0.01	0.67	0.54	0.45	0.25	0.59	0.05
Control Delay	39.1	34.7	14.0	40.7	33.1	0.0	32.0	10.9	1.0	39.0	20.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	34.7	14.0	40.7	33.1	0.0	32.0	10.9	1.0	39.0	20.1	0.1
Queue Length 50th (ft)	13	25	58	21	26	0	111	200	0	13	161	0
Queue Length 95th (ft)	32	48	114	40	50	0	166	254	0	31	207	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	220	918	682	300	918	1500	858	3986	1500	220	2733	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.11	0.36	0.41	0.12	0.01	0.55	0.54	0.45	0.25	0.51	0.05

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	94	230	113	99	20	442	1999	622	50	1301	72
Future Volume (veh/h)	51	94	230	113	99	20	442	1999	622	50	1301	72
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	55	101	247	122	106	0	475	2149	0	54	1399	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	130	546	535	236	596		565	3071		129	2157	
Arrive On Green	0.04	0.16	0.16	0.06	0.18	0.00	0.19	0.50	0.00	0.04	0.35	0.00
Sat Flow, veh/h	2910	3367	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	55	101	247	122	106	0	475	2149	0	54	1399	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	1.4	2.0	9.9	2.3	2.1	0.0	12.3	21.1	0.0	1.4	15.0	0.0
Cycle Q Clear(g_c), s	1.4	2.0	9.9	2.3	2.1	0.0	12.3	21.1	0.0	1.4	15.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	130	546	535	236	596		565	3071		129	2157	
V/C Ratio(X)	0.42	0.18	0.46	0.52	0.18		0.84	0.70		0.42	0.65	
Avail Cap(c_a), veh/h	186	776	637	254	776		726	3433		186	2302	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	36.3	28.3	19.4	35.7	27.3	0.0	30.3	14.9	0.0	36.4	21.2	0.0
Incr Delay (d2), s/veh	2.2	0.2	0.6	1.8	0.1	0.0	7.0	0.6	0.0	2.2	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.8	3.4	0.8	0.8	0.0	4.7	6.7	0.0	0.5	5.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.5	28.4	20.0	37.4	27.5	0.0	37.4	15.4	0.0	38.5	21.8	0.0
LnGrp LOS	D	C	B	D	C		D	B		D	C	
Approach Vol, veh/h		403			228	A		2624	A		1453	A
Approach Delay, s/veh		24.6			32.8			19.4			22.4	
Approach LOS		C			C			B			C	

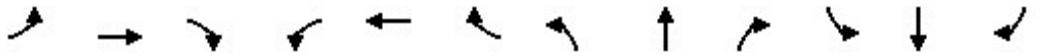
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	43.9	9.1	17.2	19.7	32.1	8.0	18.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	44.0	5.0	18.0	19.5	29.5	5.0	18.0
Max Q Clear Time (g_c+I1), s	3.4	23.1	4.3	11.9	14.3	17.0	3.4	4.1
Green Ext Time (p_c), s	0.0	16.2	0.0	0.8	0.9	7.6	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	21.4
HCM 6th LOS	C

Notes

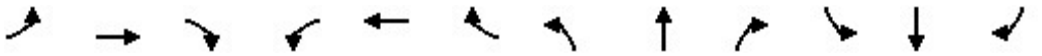
User approved changes to right turn type.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			236			236			236			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



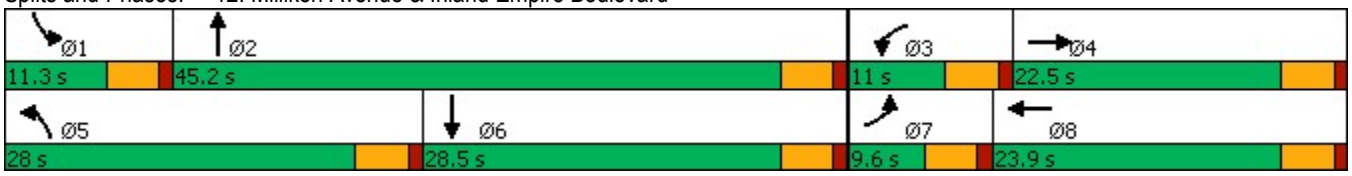
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	61	32	50	95	75	19	390	1009	106	31	792	125
Future Volume (vph)	61	32	50	95	75	19	390	1009	106	31	792	125
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	71	37	58	110	87	22	453	1173	123	36	921	145
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	37	58	110	87	22	453	1173	123	36	921	145

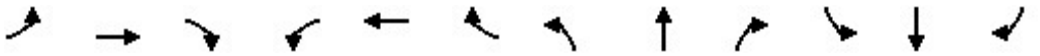
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	32	50	95	75	19	390	1009	106	31	792	125
Future Volume (vph)	61	32	50	95	75	19	390	1009	106	31	792	125
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.6	22.5		11.0	23.9		28.0	45.2		11.3	28.5	
Total Split (%)	10.7%	25.0%		12.2%	26.6%		31.1%	50.2%		12.6%	31.7%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	5.8	7.0	60.1	11.0	7.9	60.1	15.7	37.7	60.1	6.9	18.6	60.1
Actuated g/C Ratio	0.10	0.12	1.00	0.18	0.13	1.00	0.26	0.63	1.00	0.11	0.31	1.00
v/c Ratio	0.25	0.09	0.04	0.21	0.20	0.01	0.60	0.31	0.08	0.11	0.49	0.10
Control Delay	34.1	30.5	0.0	28.9	29.9	0.0	25.6	8.9	0.1	31.2	19.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	30.5	0.0	28.9	29.9	0.0	25.6	8.9	0.1	31.2	19.7	0.1
LOS	C	C	A	C	C	A	C	A	A	C	B	A
Approach Delay		21.4			26.4			12.6			17.5	
Approach LOS		C			C			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 60.1	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 15.7	Intersection LOS: B
Intersection Capacity Utilization 46.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	71	37	58	110	87	22	453	1173	123	36	921	145
v/c Ratio	0.25	0.09	0.04	0.21	0.20	0.01	0.60	0.31	0.08	0.11	0.49	0.10
Control Delay	34.1	30.5	0.0	28.9	29.9	0.0	25.6	8.9	0.1	31.2	19.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	30.5	0.0	28.9	29.9	0.0	25.6	8.9	0.1	31.2	19.7	0.1
Queue Length 50th (ft)	13	7	0	17	16	0	82	58	0	6	87	0
Queue Length 95th (ft)	35	21	0	48	39	0	134	114	0	21	127	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	280	1149	1500	544	1238	1500	1293	4147	1500	374	2774	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.03	0.04	0.20	0.07	0.01	0.35	0.28	0.08	0.10	0.33	0.10

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	32	50	95	75	19	390	1009	106	31	792	125
Future Volume (veh/h)	61	32	50	95	75	19	390	1009	106	31	792	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	71	37	0	110	87	0	453	1173	0	36	921	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	179	304		222	353		614	2739		113	1691	
Arrive On Green	0.06	0.09	0.00	0.08	0.10	0.00	0.21	0.45	0.00	0.04	0.28	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	71	37	0	110	87	0	453	1173	0	36	921	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	1.2	0.5	0.0	1.9	1.2	0.0	7.6	6.8	0.0	0.6	6.7	0.0
Cycle Q Clear(g_c), s	1.2	0.5	0.0	1.9	1.2	0.0	7.6	6.8	0.0	0.6	6.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	179	304		222	353		614	2739		113	1691	
V/C Ratio(X)	0.40	0.12		0.49	0.25		0.74	0.43		0.32	0.54	
Avail Cap(c_a), veh/h	285	1162		363	1252		1311	4756		379	2805	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.5	21.8	0.0	23.1	21.4	0.0	19.2	9.8	0.0	24.4	16.0	0.0
Incr Delay (d2), s/veh	1.4	0.2	0.0	1.7	0.4	0.0	1.8	0.1	0.0	1.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.2	0.0	0.7	0.5	0.0	2.4	1.9	0.0	0.2	2.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.0	22.0	0.0	24.8	21.8	0.0	21.0	9.9	0.0	26.0	16.3	0.0
LnGrp LOS	C	C		C	C		C	A		C	B	
Approach Vol, veh/h		108	A		197	A		1626	A		957	A
Approach Delay, s/veh		23.9			23.5			13.0			16.7	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	27.9	8.5	9.2	15.5	19.0	7.7	10.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.8	40.7	6.5	18.0	23.5	24.0	5.1	19.4
Max Q Clear Time (g_c+I1), s	2.6	8.8	3.9	2.5	9.6	8.7	3.2	3.2
Green Ext Time (p_c), s	0.0	10.4	0.1	0.1	1.4	5.8	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	15.3
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.943	0.850				
Flt Protected	0.970					
Satd. Flow (prot)	2958	1365	6071	0	0	6071
Flt Permitted	0.970					
Satd. Flow (perm)	2958	1365	6071	0	0	6071
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	2	2				
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

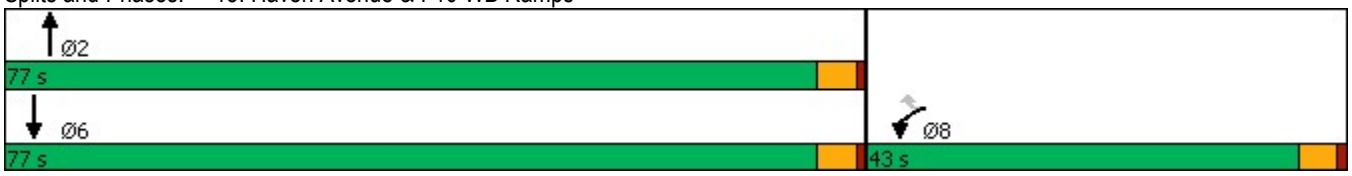
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	477	653	2503	0	0	1478
Future Volume (vph)	477	653	2503	0	0	1478
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	524	718	2751	0	0	1624
Shared Lane Traffic (%)		45%				
Lane Group Flow (vph)	847	395	2751	0	0	1624

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	477	653	2503	1478
Future Volume (vph)	477	653	2503	1478
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	43.0	43.0	77.0	77.0
Total Split (%)	35.8%	35.8%	64.2%	64.2%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	37.0	37.0	72.5	72.5
Actuated g/C Ratio	0.31	0.31	0.61	0.61
v/c Ratio	0.92	0.93	0.74	0.44
Control Delay	54.8	68.3	18.1	12.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	54.8	68.3	18.1	12.8
LOS	D	E	B	B
Approach Delay	59.1		18.1	12.8
Approach LOS	E		B	B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 118.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 25.6	Intersection LOS: C
Intersection Capacity Utilization 76.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps



Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	847	395	2751	1624
v/c Ratio	0.92	0.93	0.74	0.44
Control Delay	54.8	68.3	18.1	12.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	54.8	68.3	18.1	12.8
Queue Length 50th (ft)	320	318	421	185
Queue Length 95th (ft)	#434	#527	465	212
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	962	445	3715	3715
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.88	0.89	0.74	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

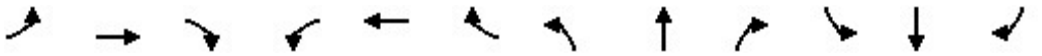
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	477	653	2503	0	0	1478
Future Volume (veh/h)	477	653	2503	0	0	1478
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1673	1772	1772	0	0	1772
Adj Flow Rate, veh/h	414	836	2751	0	0	1624
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	496	934	3708	0	0	3708
Arrive On Green	0.31	0.31	0.61	0.00	0.00	0.61
Sat Flow, veh/h	1594	3003	6592	0	0	6592
Grp Volume(v), veh/h	414	836	2751	0	0	1624
Grp Sat Flow(s),veh/h/ln	1594	1502	1524	0	0	1524
Q Serve(g_s), s	27.0	29.7	36.0	0.0	0.0	15.9
Cycle Q Clear(g_c), s	27.0	29.7	36.0	0.0	0.0	15.9
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	496	934	3708	0	0	3708
V/C Ratio(X)	0.83	0.89	0.74	0.00	0.00	0.44
Avail Cap(c_a), veh/h	549	1035	3957	0	0	3957
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	35.8	36.7	15.6	0.0	0.0	11.7
Incr Delay (d2), s/veh	9.9	9.5	0.7	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.7	11.9	11.8	0.0	0.0	5.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	45.7	46.2	16.3	0.0	0.0	11.8
LnGrp LOS	D	D	B	A	A	B
Approach Vol, veh/h	1250		2751			1624
Approach Delay, s/veh	46.1		16.3			11.8
Approach LOS	D		B			B

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		72.4			72.4	39.2
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		72.5			72.5	38.5
Max Q Clear Time (g_c+I1), s		38.0			17.9	31.7
Green Ext Time (p_c), s		29.9			19.7	3.1

Intersection Summary	
HCM 6th Ctrl Delay	21.6
HCM 6th LOS	C

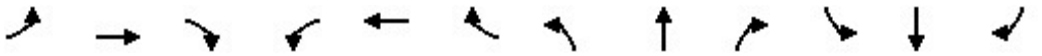
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			256			182			325			249
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



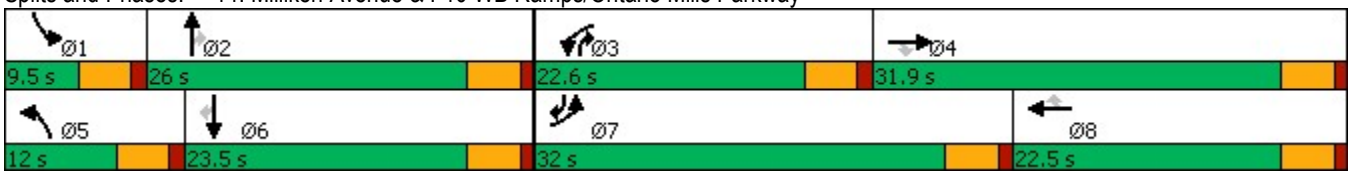
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	564	86	228	156	178	33	148	859	289	80	525	243
Future Volume (vph)	564	86	228	156	178	33	148	859	289	80	525	243
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	634	97	256	175	200	37	166	965	325	90	590	273
Shared Lane Traffic (%)												
Lane Group Flow (vph)	634	97	256	175	200	37	166	965	325	90	590	273

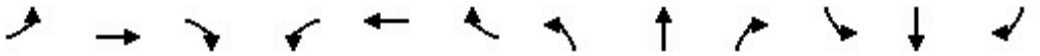
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	564	86	228	156	178	33	148	859	289	80	525	243
Future Volume (vph)	564	86	228	156	178	33	148	859	289	80	525	243
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	32.0	31.9	31.9	22.6	22.5	22.5	12.0	26.0	22.6	9.5	23.5	32.0
Total Split (%)	35.6%	35.4%	35.4%	25.1%	25.0%	25.0%	13.3%	28.9%	25.1%	10.6%	26.1%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	21.6	21.4	21.4	10.1	10.0	10.0	7.5	20.9	35.7	5.1	15.9	42.1
Actuated g/C Ratio	0.29	0.29	0.29	0.14	0.14	0.14	0.10	0.28	0.49	0.07	0.22	0.57
v/c Ratio	0.75	0.19	0.41	0.44	0.44	0.10	0.56	0.56	0.36	0.45	0.45	0.28
Control Delay	30.1	21.8	5.4	34.5	34.3	0.6	42.8	25.6	2.9	44.1	26.8	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	21.8	5.4	34.5	34.3	0.6	42.8	25.6	2.9	44.1	26.8	2.2
LOS	C	C	A	C	C	A	D	C	A	D	C	A
Approach Delay		22.9			31.4			22.5			21.4	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 73.5	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 23.3	Intersection LOS: C
Intersection Capacity Utilization 56.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway

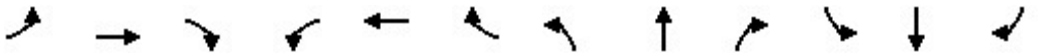




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	634	97	256	175	200	37	166	965	325	90	590	273
v/c Ratio	0.75	0.19	0.41	0.44	0.44	0.10	0.56	0.56	0.36	0.45	0.45	0.28
Control Delay	30.1	21.8	5.4	34.5	34.3	0.6	42.8	25.6	2.9	44.1	26.8	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	21.8	5.4	34.5	34.3	0.6	42.8	25.6	2.9	44.1	26.8	2.2
Queue Length 50th (ft)	139	34	0	40	46	0	39	114	0	21	68	4
Queue Length 95th (ft)	206	74	50	72	83	0	#83	165	40	#47	105	33
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	1110	675	732	730	843	513	302	1823	1030	202	1611	1079
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.14	0.35	0.24	0.24	0.07	0.55	0.53	0.32	0.45	0.37	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	564	86	228	156	178	33	148	859	289	80	525	243
Future Volume (veh/h)	564	86	228	156	178	33	148	859	289	80	525	243
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	634	97	256	175	200	37	166	965	325	90	590	273
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	779	496	420	268	350	156	244	1715	561	183	1587	793
Arrive On Green	0.27	0.28	0.28	0.09	0.10	0.10	0.08	0.28	0.28	0.06	0.26	0.26
Sat Flow, veh/h	2910	1772	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	634	97	256	175	200	37	166	965	325	90	590	273
Grp Sat Flow(s),veh/h/ln	1455	1772	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	12.9	2.6	9.4	3.7	3.6	1.4	3.5	8.6	11.0	1.9	5.0	6.6
Cycle Q Clear(g_c), s	12.9	2.6	9.4	3.7	3.6	1.4	3.5	8.6	11.0	1.9	5.0	6.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	779	496	420	268	350	156	244	1715	561	183	1587	793
V/C Ratio(X)	0.81	0.20	0.61	0.65	0.57	0.24	0.68	0.56	0.58	0.49	0.37	0.34
Avail Cap(c_a), veh/h	1263	766	649	831	957	427	345	2069	648	230	1828	852
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.7	17.4	19.8	27.8	27.0	26.1	28.2	19.4	15.9	28.7	19.2	8.6
Incr Delay (d2), s/veh	2.2	0.2	1.4	2.7	1.5	0.8	3.3	0.3	1.0	2.1	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	1.0	3.2	1.3	1.4	0.5	1.3	2.8	3.5	0.7	1.7	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.9	17.6	21.2	30.5	28.5	26.8	31.5	19.7	16.8	30.8	19.3	8.9
LnGrp LOS	C	B	C	C	C	C	C	B	B	C	B	A
Approach Vol, veh/h		987			412			1456			953	
Approach Delay, s/veh		22.6			29.2			20.4			17.4	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.5	22.3	10.3	22.2	9.8	21.0	21.5	11.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	21.5	18.1	27.4	7.5	19.0	27.5	18.0
Max Q Clear Time (g_c+I1), s	3.9	13.0	5.7	11.4	5.5	8.6	14.9	5.6
Green Ext Time (p_c), s	0.0	4.9	0.4	1.3	0.1	3.7	2.0	1.0

Intersection Summary	
HCM 6th Ctrl Delay	21.2
HCM 6th LOS	C

Notes

User approved changes to right turn type.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.993	0.850				
Flt Protected	0.954					
Satd. Flow (prot)	3063	1365	0	6071	6071	0
Flt Permitted	0.954					
Satd. Flow (perm)	3063	1365	0	6071	6071	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	4	4				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

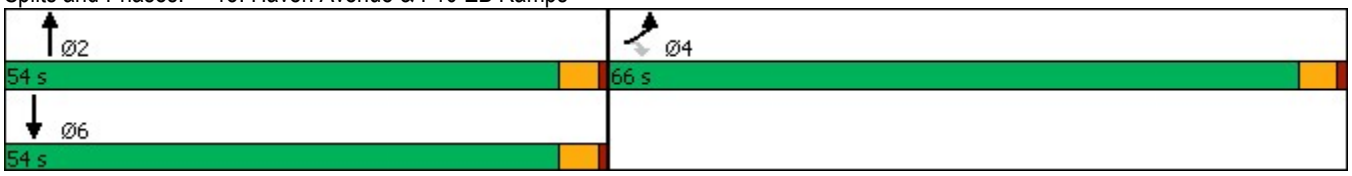
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	1190	560	0	1629	1467	0
Future Volume (vph)	1190	560	0	1629	1467	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1337	629	0	1830	1648	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	1400	566	0	1830	1648	0

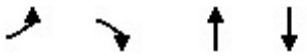
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1190	560	1629	1467
Future Volume (vph)	1190	560	1629	1467
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	66.0	66.0	54.0	54.0
Total Split (%)	55.0%	55.0%	45.0%	45.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	56.8	56.8	47.3	47.3
Actuated g/C Ratio	0.50	0.50	0.42	0.42
v/c Ratio	0.91	0.82	0.72	0.65
Control Delay	35.9	35.9	30.0	28.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	35.9	35.9	30.0	28.3
LOS	D	D	C	C
Approach Delay	35.9		30.0	28.3
Approach LOS	D		C	C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 113.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 31.6	Intersection LOS: C
Intersection Capacity Utilization 76.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1400	566	1830	1648
v/c Ratio	0.91	0.82	0.72	0.65
Control Delay	35.9	35.9	30.0	28.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	35.9	35.9	30.0	28.3
Queue Length 50th (ft)	483	384	341	294
Queue Length 95th (ft)	585	561	379	331
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	1687	753	2689	2689
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.83	0.75	0.68	0.61

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1190	560	0	1629	1467	0
Future Volume (veh/h)	1190	560	0	1629	1467	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1772	0	1772	1772	0
Adj Flow Rate, veh/h	1337	629	0	1830	1648	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	1555	733	0	2566	2566	0
Arrive On Green	0.49	0.49	0.00	0.42	0.42	0.00
Sat Flow, veh/h	3188	1502	0	6592	6592	0
Grp Volume(v), veh/h	1337	629	0	1830	1648	0
Grp Sat Flow(s),veh/h/ln	1594	1502	0	1524	1524	0
Q Serve(g_s), s	36.6	36.5	0.0	24.5	21.2	0.0
Cycle Q Clear(g_c), s	36.6	36.5	0.0	24.5	21.2	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	1555	733	0	2566	2566	0
V/C Ratio(X)	0.86	0.86	0.00	0.71	0.64	0.00
Avail Cap(c_a), veh/h	1984	934	0	3053	3053	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.3	22.3	0.0	23.7	22.7	0.0
Incr Delay (d2), s/veh	3.3	6.6	0.0	0.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.6	13.4	0.0	8.6	7.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	25.6	28.9	0.0	24.3	23.1	0.0
LnGrp LOS	C	C	A	C	C	A
Approach Vol, veh/h	1966			1830	1648	
Approach Delay, s/veh	26.7			24.3	23.1	
Approach LOS	C			C	C	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		46.1		52.7		46.1
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		49.5		61.5		49.5
Max Q Clear Time (g_c+I1), s		26.5		38.6		23.2
Green Ext Time (p_c), s		15.1		9.7		14.6

Intersection Summary		
HCM 6th Ctrl Delay	24.8	
HCM 6th LOS	C	

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1600	1800	1600	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2891	1500	2891	6071	6071	1500
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2891	1500	2891	6071	6071	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		6				254
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	629	564	153	671	699	221
Future Volume (vph)	629	564	153	671	699	221
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	723	648	176	771	803	254
Shared Lane Traffic (%)						
Lane Group Flow (vph)	723	648	176	771	803	254

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	629	564	153	671	699	221
Future Volume (vph)	629	564	153	671	699	221
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	38.0	28.0	28.0	52.0	24.0	38.0
Total Split (%)	42.2%	31.1%	31.1%	57.8%	26.7%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	22.2	38.2	11.3	32.1	16.1	43.0
Actuated g/C Ratio	0.35	0.60	0.18	0.50	0.25	0.67
v/c Ratio	0.72	0.72	0.34	0.25	0.53	0.23
Control Delay	23.3	14.3	27.0	9.7	23.4	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	14.3	27.0	9.7	23.4	1.3
LOS	C	B	C	A	C	A
Approach Delay	19.1			12.9	18.1	
Approach LOS	B			B	B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 63.8	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 17.0	Intersection LOS: B
Intersection Capacity Utilization 55.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

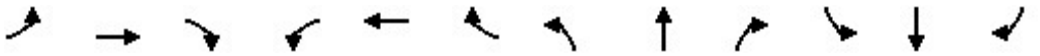
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	723	648	176	771	803	254
v/c Ratio	0.72	0.72	0.34	0.25	0.53	0.23
Control Delay	23.3	14.3	27.0	9.7	23.4	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	14.3	27.0	9.7	23.4	1.3
Queue Length 50th (ft)	118	153	30	44	74	0
Queue Length 95th (ft)	214	265	65	80	141	20
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	1598	1216	1122	4691	1954	1328
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.53	0.16	0.16	0.41	0.19

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	629	564	153	671	699	221
Future Volume (veh/h)	629	564	153	671	699	221
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1772	1575	1772	1772	1772
Adj Flow Rate, veh/h	723	648	176	771	803	254
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1314	820	276	2429	1394	1021
Arrive On Green	0.45	0.45	0.09	0.40	0.23	0.23
Sat Flow, veh/h	2910	1502	2910	6343	6343	1502
Grp Volume(v), veh/h	723	648	176	771	803	254
Grp Sat Flow(s),veh/h/ln	1455	1502	1455	1524	1524	1502
Q Serve(g_s), s	10.9	20.7	3.5	5.2	7.0	3.9
Cycle Q Clear(g_c), s	10.9	20.7	3.5	5.2	7.0	3.9
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1314	820	276	2429	1394	1021
V/C Ratio(X)	0.55	0.79	0.64	0.32	0.58	0.25
Avail Cap(c_a), veh/h	1626	981	1141	4829	1982	1166
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.0	10.9	26.1	12.4	20.5	3.7
Incr Delay (d2), s/veh	0.4	3.7	2.4	0.1	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	16.5	1.2	1.6	2.3	3.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.4	14.6	28.6	12.5	20.9	3.8
LnGrp LOS	B	B	C	B	C	A
Approach Vol, veh/h	1371			947	1057	
Approach Delay, s/veh	13.4			15.5	16.8	
Approach LOS	B			B	B	

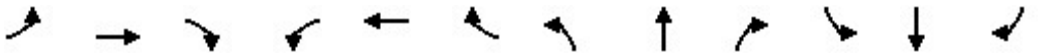
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		28.4		31.6	10.2	18.2
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		47.5		33.5	23.5	19.5
Max Q Clear Time (g_c+I1), s		7.2		22.7	5.5	9.0
Green Ext Time (p_c), s		6.4		4.4	0.5	4.7

Intersection Summary	
HCM 6th Ctrl Delay	15.1
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.964				0.850			0.850		0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4644	0	2891	3353	1500	2891	4818	1500	2891	5888	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4644	0	2891	3353	1500	2891	4818	1500	2891	5888	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		65				136			177		65	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	350	660	208	118	565	98	242	1468	171	140	1412	356
Future Volume (vph)	350	660	208	118	565	98	242	1468	171	140	1412	356
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	380	717	226	128	614	107	263	1596	186	152	1535	387
Shared Lane Traffic (%)												
Lane Group Flow (vph)	380	943	0	128	614	107	263	1596	186	152	1922	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	350	660	118	565	98	242	1468	171	140	1412
Future Volume (vph)	350	660	118	565	98	242	1468	171	140	1412
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	22.0	37.0	14.0	29.0	29.0	14.0	57.0		12.0	55.0
Total Split (%)	18.3%	30.8%	11.7%	24.2%	24.2%	11.7%	47.5%		10.0%	45.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	17.3	32.4	9.0	24.1	24.1	9.5	52.5	119.4	7.5	50.5
Actuated g/C Ratio	0.14	0.27	0.08	0.20	0.20	0.08	0.44	1.00	0.06	0.42
v/c Ratio	0.91	0.72	0.59	0.91	0.26	1.15	0.75	0.12	0.84	0.76
Control Delay	76.7	40.3	64.8	65.1	4.8	153.6	31.0	0.2	91.0	30.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.7	40.3	64.8	65.1	4.8	153.6	31.0	0.2	91.0	30.8
LOS	E	D	E	E	A	F	C	A	F	C
Approach Delay		50.8		57.5			43.9			35.2
Approach LOS		D		E			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.4	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay: 44.3	Intersection LOS: D
Intersection Capacity Utilization 79.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Haven Avenue & 4th Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	380	943	128	614	107	263	1596	186	152	1922
v/c Ratio	0.91	0.72	0.59	0.91	0.26	1.15	0.75	0.12	0.84	0.76
Control Delay	76.7	40.3	64.8	65.1	4.8	153.6	31.0	0.2	91.0	30.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.7	40.3	64.8	65.1	4.8	153.6	31.0	0.2	91.0	30.8
Queue Length 50th (ft)	151	227	50	246	0	~123	373	0	61	352
Queue Length 95th (ft)	#240	279	83	#348	28	#210	434	0	#121	399
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	423	1312	229	687	415	229	2117	1500	181	2527
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.72	0.56	0.89	0.26	1.15	0.75	0.12	0.84	0.76

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

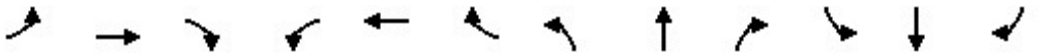
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	350	660	208	118	565	98	242	1468	171	140	1412	356
Future Volume (veh/h)	350	660	208	118	565	98	242	1468	171	140	1412	356
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	380	717	226	128	614	107	263	1596	0	152	1535	387
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	423	1044	325	174	674	300	232	2131		183	2072	522
Arrive On Green	0.15	0.29	0.29	0.06	0.20	0.20	0.08	0.44	0.00	0.06	0.42	0.42
Sat Flow, veh/h	2910	3655	1137	2910	3367	1502	2910	4837	1502	2910	4889	1233
Grp Volume(v), veh/h	380	632	311	128	614	107	263	1596	0	152	1435	487
Grp Sat Flow(s),veh/h/ln	1455	1612	1567	1455	1683	1502	1455	1612	1502	1455	1524	1550
Q Serve(g_s), s	15.3	20.7	21.1	5.2	21.3	7.3	9.5	32.8	0.0	6.2	31.4	31.4
Cycle Q Clear(g_c), s	15.3	20.7	21.1	5.2	21.3	7.3	9.5	32.8	0.0	6.2	31.4	31.4
Prop In Lane	1.00		0.73	1.00		1.00	1.00		1.00	1.00		0.80
Lane Grp Cap(c), veh/h	423	921	448	174	674	300	232	2131		183	1937	657
V/C Ratio(X)	0.90	0.69	0.70	0.74	0.91	0.36	1.13	0.75		0.83	0.74	0.74
Avail Cap(c_a), veh/h	427	921	448	232	692	309	232	2131		183	1937	657
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.1	37.8	37.9	55.1	46.6	41.1	54.8	27.8	0.0	55.2	28.8	28.8
Incr Delay (d2), s/veh	21.2	2.1	4.6	8.0	16.1	0.7	99.8	2.5	0.0	26.2	2.6	7.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	8.4	8.6	2.1	10.4	2.8	6.7	12.9	0.0	2.9	11.7	12.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.2	39.9	42.6	63.1	62.8	41.8	154.7	30.3	0.0	81.4	31.4	36.2
LnGrp LOS	E	D	D	E	E	D	F	C		F	C	D
Approach Vol, veh/h		1323			849			1859	A		2074	
Approach Delay, s/veh		49.5			60.2			47.9			36.2	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	57.0	11.6	38.5	14.0	55.0	21.8	28.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	52.5	9.5	32.5	9.5	50.5	17.5	24.5
Max Q Clear Time (g_c+I1), s	8.2	34.8	7.2	23.1	11.5	33.4	17.3	23.3
Green Ext Time (p_c), s	0.0	11.0	0.1	4.3	0.0	12.2	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	46.0
HCM 6th LOS	D

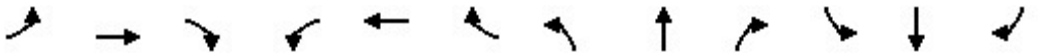
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt						0.850			0.850		0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	6071	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	6071	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				127			202		258	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	4	1731	5	1	1044	14	14	0	9	45	0	12
Future Volume (vph)	4	1731	5	1	1044	14	14	0	9	45	0	12
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	4	1822	5	1	1099	15	15	0	9	47	0	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	1827	0	1	1099	15	15	0	9	47	13	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	4	1731	1	1044	14	14	9	45	0
Future Volume (vph)	4	1731	1	1044	14	14	9	45	0
Turn Type	Prot	NA	Prot	NA	Perm	Prot	Perm	Prot	NA
Protected Phases	7	4	3	8		5		1	6
Permitted Phases					8		2		
Detector Phase	7	4	3	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.5	42.4	9.5	42.4	42.4	11.8	23.7	14.4	26.3
Total Split (%)	10.6%	47.1%	10.6%	47.1%	47.1%	13.1%	26.3%	16.0%	29.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.4	33.6	5.4	33.6	33.6	6.5	5.9	7.6	10.6
Actuated g/C Ratio	0.09	0.59	0.09	0.59	0.59	0.11	0.10	0.13	0.19
v/c Ratio	0.03	0.51	0.01	0.39	0.02	0.08	0.03	0.22	0.02
Control Delay	31.5	8.8	31.0	8.1	0.0	30.5	0.1	30.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.5	8.8	31.0	8.1	0.0	30.5	0.1	30.1	0.1
LOS	C	A	C	A	A	C	A	C	A
Approach Delay		8.9		8.0					23.6
Approach LOS		A		A					C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 57.1	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 8.9	Intersection LOS: A
Intersection Capacity Utilization 46.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street

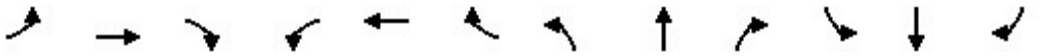
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	4	1827	1	1099	15	15	9	47	13
v/c Ratio	0.03	0.51	0.01	0.39	0.02	0.08	0.03	0.22	0.02
Control Delay	31.5	8.8	31.0	8.1	0.0	30.5	0.1	30.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.5	8.8	31.0	8.1	0.0	30.5	0.1	30.1	0.1
Queue Length 50th (ft)	2	106	0	73	0	5	0	17	0
Queue Length 95th (ft)	11	206	5	150	0	24	0	51	0
Internal Link Dist (ft)		2546		362					358
Turn Bay Length (ft)	130		130		145	165	165	50	
Base Capacity (vph)	149	4324	149	3431	1105	217	672	295	1323
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.42	0.01	0.32	0.01	0.07	0.01	0.16	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1731	5	1	1044	14	14	0	9	45	0	12
Future Volume (veh/h)	4	1731	5	1	1044	14	14	0	9	45	0	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	4	1822	5	1	1099	15	15	0	9	47	0	13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	9	3277	9	3	2488	772	30	167	141	75	206	184
Arrive On Green	0.01	0.52	0.52	0.00	0.51	0.51	0.02	0.00	0.09	0.05	0.00	0.12
Sat Flow, veh/h	1594	6323	17	1594	4837	1502	1594	1772	1502	1594	1683	1502
Grp Volume(v), veh/h	4	1317	510	1	1099	15	15	0	9	47	0	13
Grp Sat Flow(s),veh/h/ln	1594	1524	1769	1594	1612	1502	1594	1772	1502	1594	1683	1502
Q Serve(g_s), s	0.1	10.4	10.4	0.0	7.6	0.3	0.5	0.0	0.3	1.5	0.0	0.4
Cycle Q Clear(g_c), s	0.1	10.4	10.4	0.0	7.6	0.3	0.5	0.0	0.3	1.5	0.0	0.4
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	9	2369	917	3	2488	772	30	167	141	75	206	184
V/C Ratio(X)	0.47	0.56	0.56	0.33	0.44	0.02	0.50	0.00	0.06	0.63	0.00	0.07
Avail Cap(c_a), veh/h	150	3264	1263	150	3454	1072	219	641	543	297	691	617
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.3	8.7	8.7	26.5	8.1	6.3	25.8	0.0	21.9	24.8	0.0	20.6
Incr Delay (d2), s/veh	34.4	0.2	0.5	54.7	0.1	0.0	12.5	0.0	0.2	8.3	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	2.6	3.2	0.1	2.1	0.1	0.3	0.0	0.1	0.7	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.7	8.9	9.2	81.2	8.2	6.3	38.3	0.0	22.1	33.1	0.0	20.8
LnGrp LOS	E	A	A	F	A	A	D	A	C	C	A	C
Approach Vol, veh/h		1831			1115			24			60	
Approach Delay, s/veh		9.1			8.3			32.3			30.4	
Approach LOS		A			A			C			C	

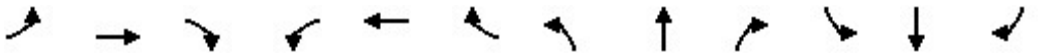
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	9.5	4.6	32.0	5.5	11.0	4.8	31.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.9	19.2	5.0	37.9	7.3	21.8	5.0	37.9
Max Q Clear Time (g_c+I1), s	3.5	2.3	2.0	12.4	2.5	2.4	2.1	9.6
Green Ext Time (p_c), s	0.0	0.0	0.0	15.2	0.0	0.0	0.0	9.3

Intersection Summary	
HCM 6th Ctrl Delay	9.4
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.995				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.953	
Satd. Flow (prot)	2891	6065	0	1583	4794	0	1583	1765	1500	0	1682	1500
Flt Permitted	0.950			0.950			0.728				0.731	
Satd. Flow (perm)	2891	6065	0	1583	4794	0	1213	1765	1500	0	1290	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			10				155			94
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



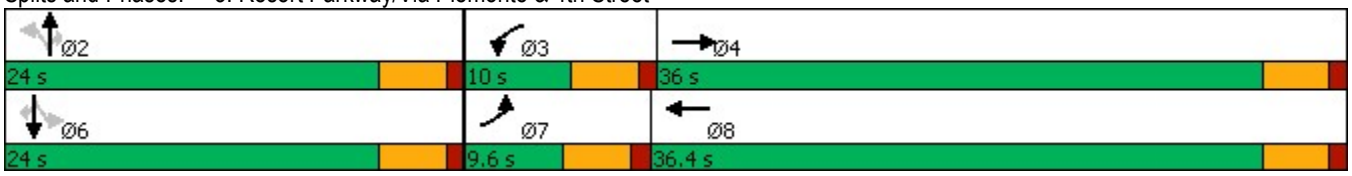
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	28	1747	8	5	1044	37	11	0	19	41	1	19
Future Volume (vph)	28	1747	8	5	1044	37	11	0	19	41	1	19
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	29	1839	8	5	1099	39	12	0	20	43	1	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	1847	0	5	1138	0	12	0	20	0	44	20

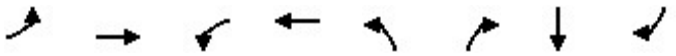
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	28	1747	5	1044	11	19	41	1	19
Future Volume (vph)	28	1747	5	1044	11	19	41	1	19
Turn Type	Prot	NA	Prot	NA	Perm	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8				6	
Permitted Phases					2	2	6		6
Detector Phase	7	4	3	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.6	36.0	10.0	36.4	24.0	24.0	24.0	24.0	24.0
Total Split (%)	13.7%	51.4%	14.3%	52.0%	34.3%	34.3%	34.3%	34.3%	34.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min
Act Effct Green (s)	5.2	29.1	5.6	29.2	7.2	7.2		7.2	7.2
Actuated g/C Ratio	0.11	0.62	0.12	0.62	0.15	0.15		0.15	0.15
v/c Ratio	0.09	0.49	0.03	0.38	0.07	0.06		0.23	0.07
Control Delay	23.2	6.1	22.8	5.5	20.5	0.3		22.9	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	23.2	6.1	22.8	5.5	20.5	0.3		22.9	0.4
LOS	C	A	C	A	C	A		C	A
Approach Delay		6.4		5.6				15.9	
Approach LOS		A		A				B	

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 47.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 6.3	Intersection LOS: A
Intersection Capacity Utilization 46.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street





Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBT	SBR
Lane Group Flow (vph)	29	1847	5	1138	12	20	44	20
v/c Ratio	0.09	0.49	0.03	0.38	0.07	0.06	0.23	0.07
Control Delay	23.2	6.1	22.8	5.5	20.5	0.3	22.9	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	6.1	22.8	5.5	20.5	0.3	22.9	0.4
Queue Length 50th (ft)	3	52	1	36	3	0	11	0
Queue Length 95th (ft)	15	153	10	112	16	0	39	0
Internal Link Dist (ft)		362		428			378	
Turn Bay Length (ft)	220		125		115	115		110
Base Capacity (vph)	321	4165	189	3337	515	726	548	691
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.44	0.03	0.34	0.02	0.03	0.08	0.03

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	1747	8	5	1044	37	11	0	19	41	1	19
Future Volume (veh/h)	28	1747	8	5	1044	37	11	0	19	41	1	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	29	1839	8	5	1099	39	12	0	20	43	1	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	3511	15	11	2537	90	288	209	177	328	6	177
Arrive On Green	0.03	0.56	0.56	0.01	0.53	0.53	0.12	0.00	0.12	0.12	0.12	0.12
Sat Flow, veh/h	2910	6311	27	1594	4796	170	1314	1772	1502	1354	48	1502
Grp Volume(v), veh/h	29	1332	515	5	739	399	12	0	20	44	0	20
Grp Sat Flow(s),veh/h/ln	1455	1524	1767	1594	1612	1741	1314	1772	1502	1402	0	1502
Q Serve(g_s), s	0.4	7.7	7.7	0.1	5.9	5.9	0.4	0.0	0.5	1.2	0.0	0.5
Cycle Q Clear(g_c), s	0.4	7.7	7.7	0.1	5.9	5.9	1.6	0.0	0.5	1.2	0.0	0.5
Prop In Lane	1.00		0.02	1.00		0.10	1.00		1.00	0.98		1.00
Lane Grp Cap(c), veh/h	99	2544	983	11	1706	921	288	209	177	334	0	177
V/C Ratio(X)	0.29	0.52	0.52	0.47	0.43	0.43	0.04	0.00	0.11	0.13	0.00	0.11
Avail Cap(c_a), veh/h	350	3400	1314	207	2429	1312	738	816	691	813	0	691
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.0	5.9	5.9	21.0	6.1	6.1	17.7	0.0	16.7	17.0	0.0	16.7
Incr Delay (d2), s/veh	1.6	0.2	0.4	28.2	0.2	0.3	0.1	0.0	0.3	0.2	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.5	1.8	0.1	1.3	1.5	0.1	0.0	0.2	0.4	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.6	6.0	6.3	49.1	6.3	6.4	17.8	0.0	17.0	17.2	0.0	17.0
LnGrp LOS	C	A	A	D	A	A	B	A	B	B	A	B
Approach Vol, veh/h		1876			1143			32			64	
Approach Delay, s/veh		6.4			6.5			17.3			17.1	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	4.8	28.1		9.5	5.9	26.9				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		19.5	5.5	31.5		19.5	5.1	31.9				
Max Q Clear Time (g_c+I1), s		3.6	2.1	9.7		3.2	2.4	7.9				
Green Ext Time (p_c), s		0.0	0.0	13.8		0.2	0.0	8.5				

Intersection Summary	
HCM 6th Ctrl Delay	6.7
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.995					0.865
Flt Protected						
Satd. Flow (prot)	4794	0	0	4818	0	1526
Flt Permitted						
Satd. Flow (perm)	4794	0	0	4818	0	1526
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	1754	61	0	1060	0	26
Future Volume (vph)	1754	61	0	1060	0	26
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1827	64	0	1104	0	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1891	0	0	1104	0	27

Intersection Summary

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1754	61	0	1060	0	26
Future Vol, veh/h	1754	61	0	1060	0	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1827	64	0	1104	0	27

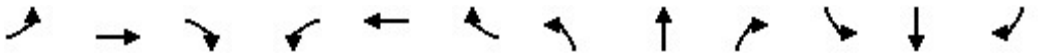
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	946
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	225
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	225
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	23.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	225	-	-	-
HCM Lane V/C Ratio	0.12	-	-	-
HCM Control Delay (s)	23.2	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.4	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.980	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5949	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5949	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			188			275			55		32	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



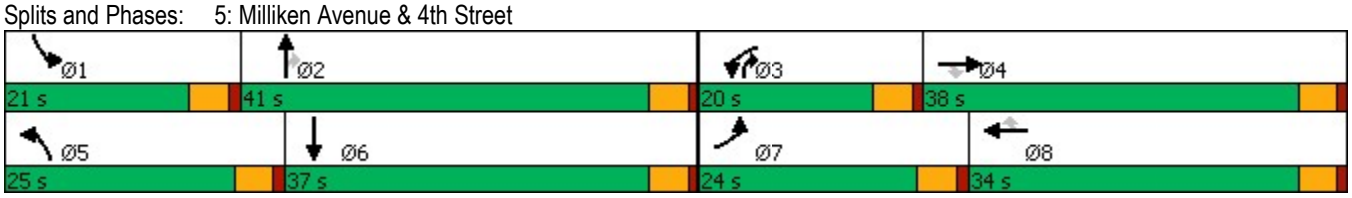
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	419	1030	198	354	813	264	290	1430	351	415	884	138
Future Volume (vph)	419	1030	198	354	813	264	290	1430	351	415	884	138
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	436	1073	206	369	847	275	302	1490	366	432	921	144
Shared Lane Traffic (%)												
Lane Group Flow (vph)	436	1073	206	369	847	275	302	1490	366	432	1065	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	419	1030	198	354	813	264	290	1430	351	415	884
Future Volume (vph)	419	1030	198	354	813	264	290	1430	351	415	884
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	24.0	38.0	38.0	20.0	34.0	34.0	25.0	41.0	20.0	21.0	37.0
Total Split (%)	20.0%	31.7%	31.7%	16.7%	28.3%	28.3%	20.8%	34.2%	16.7%	17.5%	30.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	19.3	32.3	32.3	15.5	28.5	28.5	17.1	35.7	55.7	16.5	35.1
Actuated g/C Ratio	0.16	0.27	0.27	0.13	0.24	0.24	0.14	0.30	0.47	0.14	0.30
v/c Ratio	0.92	0.81	0.38	0.97	0.73	0.48	0.72	0.81	0.50	1.07	0.59
Control Delay	75.6	45.9	8.4	91.6	45.5	7.3	58.6	42.4	20.9	113.1	36.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.6	45.9	8.4	91.6	45.5	7.3	58.6	42.4	20.9	113.1	36.5
LOS	E	D	A	F	D	A	E	D	C	F	D
Approach Delay		49.0			49.9			41.0			58.6
Approach LOS		D			D			D			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 118.1	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 48.8	Intersection LOS: D
Intersection Capacity Utilization 83.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 5: Milliken Avenue & 4th Street

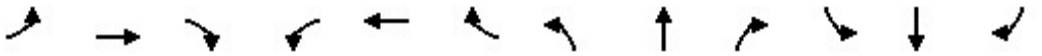


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	436	1073	206	369	847	275	302	1490	366	432	1065
v/c Ratio	0.92	0.81	0.38	0.97	0.73	0.48	0.72	0.81	0.50	1.07	0.59
Control Delay	75.6	45.9	8.4	91.6	45.5	7.3	58.6	42.4	20.9	113.1	36.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.6	45.9	8.4	91.6	45.5	7.3	58.6	42.4	20.9	113.1	36.5
Queue Length 50th (ft)	173	282	10	148	220	0	116	309	161	~193	199
Queue Length 95th (ft)	#271	338	70	#250	270	69	161	355	250	#297	246
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	477	1368	560	379	1204	581	502	1878	737	404	1791
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.78	0.37	0.97	0.70	0.47	0.60	0.79	0.50	1.07	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

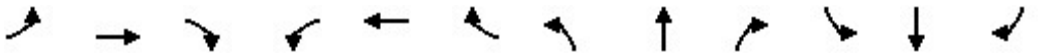
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	419	1030	198	354	813	264	290	1430	351	415	884	138
Future Volume (veh/h)	419	1030	198	354	813	264	290	1430	351	415	884	138
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	436	1073	206	369	847	275	302	1490	366	432	921	144
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	481	1285	399	392	1136	353	361	1828	653	417	1714	264
Arrive On Green	0.17	0.27	0.27	0.13	0.23	0.23	0.12	0.30	0.30	0.14	0.32	0.32
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	2910	6095	1502	2910	5368	827
Grp Volume(v), veh/h	436	1073	206	369	847	275	302	1490	366	432	782	283
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1455	1524	1502	1455	1524	1623
Q Serve(g_s), s	16.9	24.1	13.4	14.5	18.7	19.7	11.7	26.1	21.0	16.5	16.2	16.5
Cycle Q Clear(g_c), s	16.9	24.1	13.4	14.5	18.7	19.7	11.7	26.1	21.0	16.5	16.2	16.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.51
Lane Grp Cap(c), veh/h	481	1285	399	392	1136	353	361	1828	653	417	1459	518
V/C Ratio(X)	0.91	0.83	0.52	0.94	0.75	0.78	0.84	0.82	0.56	1.04	0.54	0.55
Avail Cap(c_a), veh/h	493	1408	437	392	1240	385	518	1933	679	417	1459	518
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.1	39.9	36.0	49.3	40.8	41.2	49.3	37.3	24.3	49.3	32.2	32.3
Incr Delay (d2), s/veh	20.0	4.2	1.0	30.9	2.3	9.1	8.0	2.7	1.0	53.5	0.4	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	10.0	5.0	6.9	7.6	8.2	4.6	10.0	7.5	9.1	6.0	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.1	44.1	37.0	80.2	43.1	50.4	57.2	40.0	25.3	102.8	32.6	33.5
LnGrp LOS	E	D	D	F	D	D	E	D	C	F	C	C
Approach Vol, veh/h		1715			1491			2158			1497	
Approach Delay, s/veh		49.1			53.6			39.9			53.0	
Approach LOS		D			D			D			D	

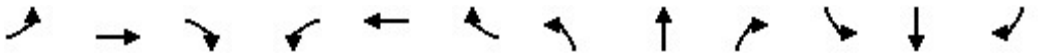
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	39.0	20.0	35.1	18.8	41.2	23.5	31.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	36.5	15.5	33.5	20.5	32.5	19.5	29.5
Max Q Clear Time (g_c+I1), s	18.5	28.1	16.5	26.1	13.7	18.5	18.9	21.7
Green Ext Time (p_c), s	0.0	6.4	0.0	4.5	0.6	6.2	0.1	4.0

Intersection Summary	
HCM 6th Ctrl Delay	48.1
HCM 6th LOS	D



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.927	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2977	1365
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2977	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			125			191			278		186	307
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



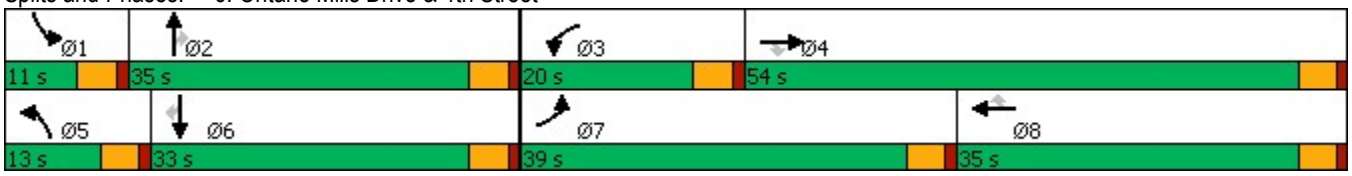
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	919	1166	115	217	928	300	136	298	338	75	300	565
Future Volume (vph)	919	1166	115	217	928	300	136	298	338	75	300	565
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	999	1267	125	236	1009	326	148	324	367	82	326	614
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	999	1267	125	236	1009	326	148	324	367	82	633	307

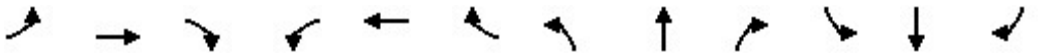
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	919	1166	115	217	928	300	136	298	338	75	300	565
Future Volume (vph)	919	1166	115	217	928	300	136	298	338	75	300	565
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	39.0	54.0	54.0	20.0	35.0	35.0	13.0	35.0	35.0	11.0	33.0	33.0
Total Split (%)	32.5%	45.0%	45.0%	16.7%	29.2%	29.2%	10.8%	29.2%	29.2%	9.2%	27.5%	27.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	34.6	50.4	50.4	13.7	29.4	29.4	8.5	26.8	26.8	6.5	24.8	24.8
Actuated g/C Ratio	0.30	0.44	0.44	0.12	0.25	0.25	0.07	0.23	0.23	0.06	0.21	0.21
v/c Ratio	1.15	0.60	0.17	0.69	0.82	0.62	1.26	0.42	0.65	0.92	0.81	0.58
Control Delay	119.4	27.1	4.4	60.5	47.3	21.4	215.4	39.4	16.3	132.5	38.9	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.4	27.1	4.4	60.5	47.3	21.4	215.4	39.4	16.3	132.5	38.9	8.9
LOS	F	C	A	E	D	C	F	D	B	F	D	A
Approach Delay		64.5			43.9			60.3			37.4	
Approach LOS		E			D			E			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 115.4	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.26	
Intersection Signal Delay: 53.6	Intersection LOS: D
Intersection Capacity Utilization 88.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 6: Ontario Mills Drive & 4th Street



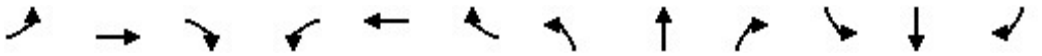


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	999	1267	125	236	1009	326	148	324	367	82	633	307
v/c Ratio	1.15	0.60	0.17	0.69	0.82	0.62	1.26	0.42	0.65	0.92	0.81	0.58
Control Delay	119.4	27.1	4.4	60.5	47.3	21.4	215.4	39.4	16.3	132.5	38.9	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.4	27.1	4.4	60.5	47.3	21.4	215.4	39.4	16.3	132.5	38.9	8.9
Queue Length 50th (ft)	~476	274	0	90	267	89	~146	109	55	64	179	0
Queue Length 95th (ft)	#614	333	37	134	326	193	#284	153	161	#169	253	85
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	867	2104	725	389	1277	537	117	889	602	89	877	569
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.15	0.60	0.17	0.61	0.79	0.61	1.26	0.36	0.61	0.92	0.72	0.54

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



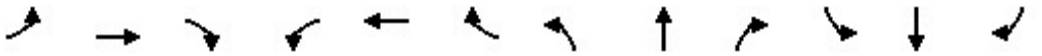
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	919	1166	115	217	928	300	136	298	338	75	300	565
Future Volume (veh/h)	919	1166	115	217	928	300	136	298	338	75	300	565
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	999	1267	125	236	1009	326	148	324	367	82	326	614
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	845	2121	658	287	1194	371	114	864	385	87	425	720
Arrive On Green	0.29	0.44	0.44	0.10	0.25	0.25	0.07	0.26	0.26	0.05	0.24	0.24
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	1594	3367	1502	1594	1772	3003
Grp Volume(v), veh/h	999	1267	125	236	1009	326	148	324	367	82	326	614
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1594	1683	1502	1594	1772	1502
Q Serve(g_s), s	34.5	23.7	6.1	9.5	23.6	24.8	8.5	9.4	28.6	6.1	20.4	23.2
Cycle Q Clear(g_c), s	34.5	23.7	6.1	9.5	23.6	24.8	8.5	9.4	28.6	6.1	20.4	23.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	845	2121	658	287	1194	371	114	864	385	87	425	720
V/C Ratio(X)	1.18	0.60	0.19	0.82	0.85	0.88	1.30	0.37	0.95	0.94	0.77	0.85
Avail Cap(c_a), veh/h	845	2121	658	380	1242	385	114	864	385	87	425	720
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.2	25.4	20.4	52.5	42.6	43.1	55.2	36.3	43.4	56.0	42.1	43.2
Incr Delay (d2), s/veh	94.1	0.5	0.1	10.4	5.4	19.7	184.2	0.3	33.6	76.6	8.2	9.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	23.3	9.1	2.2	3.9	9.9	11.2	9.2	3.9	14.1	4.3	9.8	9.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	136.3	25.9	20.6	62.9	48.0	62.8	239.4	36.6	77.0	132.6	50.3	52.8
LnGrp LOS	F	C	C	E	D	E	F	D	E	F	D	D
Approach Vol, veh/h		2391			1571			839			1022	
Approach Delay, s/veh		71.7			53.3			90.1			58.4	
Approach LOS		E			D			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	35.0	16.2	56.6	13.0	33.0	39.0	33.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	30.5	15.5	49.5	8.5	28.5	34.5	30.5
Max Q Clear Time (g_c+I1), s	8.1	30.6	11.5	25.7	10.5	25.2	36.5	26.8
Green Ext Time (p_c), s	0.0	0.0	0.3	10.7	0.0	1.5	0.0	2.5

Intersection Summary	
HCM 6th Ctrl Delay	67.1
HCM 6th LOS	E

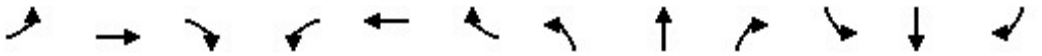
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.972			0.936				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.982	
Satd. Flow (prot)	2891	4818	1500	1583	4683	0	1583	3138	0	1504	1646	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.982	
Satd. Flow (perm)	2891	4818	1500	1583	4683	0	1583	3138	0	1504	1646	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			97		41			58				312
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



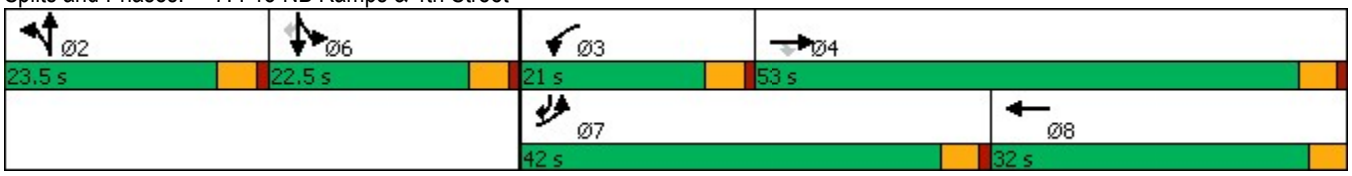
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	799	678	93	76	717	164	114	74	56	138	65	601
Future Volume (vph)	799	678	93	76	717	164	114	74	56	138	65	601
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	832	706	97	79	747	171	119	77	58	144	68	626
Shared Lane Traffic (%)										28%		
Lane Group Flow (vph)	832	706	97	79	918	0	119	135	0	104	108	626

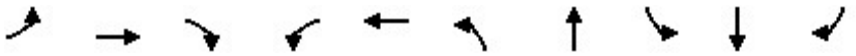
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	799	678	93	76	717	114	74	138	65	601
Future Volume (vph)	799	678	93	76	717	114	74	138	65	601
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	42.0	53.0	53.0	21.0	32.0	23.5	23.5	22.5	22.5	42.0
Total Split (%)	35.0%	44.2%	44.2%	17.5%	26.7%	19.6%	19.6%	18.8%	18.8%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	35.0	52.0	52.0	10.7	25.8	13.2	13.2	12.5	12.5	52.1
Actuated g/C Ratio	0.34	0.50	0.50	0.10	0.25	0.13	0.13	0.12	0.12	0.50
v/c Ratio	0.86	0.29	0.12	0.48	0.77	0.59	0.30	0.57	0.55	0.42
Control Delay	43.6	18.0	4.6	57.5	40.7	58.0	27.6	58.9	56.4	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.6	18.0	4.6	57.5	40.7	58.0	27.6	58.9	56.4	9.0
LOS	D	B	A	E	D	E	C	E	E	A
Approach Delay		30.2			42.0		41.8		21.3	
Approach LOS		C			D		D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 103.9	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 32.2	Intersection LOS: C
Intersection Capacity Utilization 73.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street

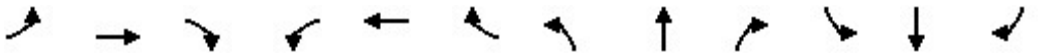




Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	832	706	97	79	918	119	135	104	108	626
v/c Ratio	0.86	0.29	0.12	0.48	0.77	0.59	0.30	0.57	0.55	0.42
Control Delay	43.6	18.0	4.6	57.5	40.7	58.0	27.6	58.9	56.4	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.6	18.0	4.6	57.5	40.7	58.0	27.6	58.9	56.4	9.0
Queue Length 50th (ft)	275	103	0	53	206	80	25	73	76	69
Queue Length 95th (ft)	#441	170	33	107	290	147	57	140	143	126
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	1068	2411	799	257	1345	296	634	266	292	1556
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.29	0.12	0.31	0.68	0.40	0.21	0.39	0.37	0.40

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	799	678	93	76	717	164	114	74	56	138	65	601
Future Volume (veh/h)	799	678	93	76	717	164	114	74	56	138	65	601
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	832	706	97	79	747	171	119	77	58	106	121	626
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	920	2382	739	99	940	213	159	191	131	265	294	1448
Arrive On Green	0.32	0.49	0.49	0.06	0.24	0.24	0.10	0.10	0.10	0.17	0.17	0.17
Sat Flow, veh/h	2910	4837	1502	1594	3943	893	1594	1908	1312	1594	1772	3003
Grp Volume(v), veh/h	832	706	97	79	610	308	119	67	68	106	121	626
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1594	1612	1611	1594	1683	1536	1594	1772	1502
Q Serve(g_s), s	27.5	8.7	3.5	4.9	17.8	18.1	7.3	3.7	4.2	6.0	6.1	13.7
Cycle Q Clear(g_c), s	27.5	8.7	3.5	4.9	17.8	18.1	7.3	3.7	4.2	6.0	6.1	13.7
Prop In Lane	1.00		1.00	1.00		0.55	1.00		0.85	1.00		1.00
Lane Grp Cap(c), veh/h	920	2382	739	99	769	384	159	168	153	265	294	1448
V/C Ratio(X)	0.90	0.30	0.13	0.80	0.79	0.80	0.75	0.40	0.44	0.40	0.41	0.43
Avail Cap(c_a), veh/h	1089	2382	739	262	917	458	302	319	291	286	318	1488
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	15.1	13.8	46.4	35.8	35.9	43.9	42.3	42.5	37.3	37.4	17.0
Incr Delay (d2), s/veh	9.6	0.1	0.1	13.5	4.1	8.5	6.8	1.5	2.0	1.0	0.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.6	3.1	1.2	2.3	7.3	7.9	3.2	1.6	1.7	2.4	2.7	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.4	15.2	13.9	59.9	39.9	44.4	50.7	43.8	44.5	38.3	38.3	17.2
LnGrp LOS	D	B	B	E	D	D	D	D	D	D	D	B
Approach Vol, veh/h		1635			997			254			853	
Approach Delay, s/veh		29.0			42.9			47.2			22.8	
Approach LOS		C			D			D			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		14.5	10.7	53.9		21.1	36.2	28.4				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		19.0	16.5	48.5		18.0	37.5	* 29				
Max Q Clear Time (g_c+I1), s		9.3	6.9	10.7		15.7	29.5	20.1				
Green Ext Time (p_c), s		0.7	0.1	6.1		1.0	2.2	3.8				

Intersection Summary	
HCM 6th Ctrl Delay	32.5
HCM 6th LOS	C

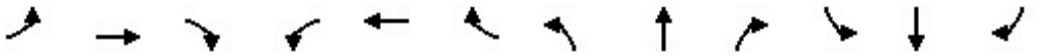
Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.907				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3041	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3041	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		63				149			149			149
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



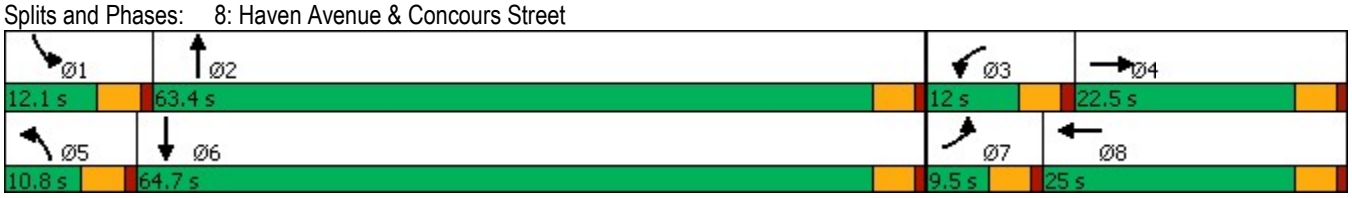
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	25	38	62	171	91	93	46	2260	176	42	1833	27
Future Volume (vph)	25	38	62	171	91	93	46	2260	176	42	1833	27
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	26	39	63	174	93	95	47	2306	180	43	1870	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	102	0	174	93	95	47	2306	180	43	1870	28

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	25	38	171	91	93	46	2260	176	42	1833	27
Future Volume (vph)	25	38	171	91	93	46	2260	176	42	1833	27
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	12.0	25.0		10.8	63.4		12.1	64.7	
Total Split (%)	8.6%	20.5%	10.9%	22.7%		9.8%	57.6%		11.0%	58.8%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.1	6.9	7.5	13.1	90.9	6.2	58.7	90.9	6.8	59.3	90.9
Actuated g/C Ratio	0.06	0.08	0.08	0.14	1.00	0.07	0.65	1.00	0.07	0.65	1.00
v/c Ratio	0.16	0.35	0.53	0.19	0.06	0.24	0.59	0.12	0.20	0.47	0.02
Control Delay	47.6	23.6	49.0	38.6	0.1	47.1	11.5	0.2	45.3	9.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.6	23.6	49.0	38.6	0.1	47.1	11.5	0.2	45.3	9.7	0.0
LOS	D	C	D	D	A	D	B	A	D	A	A
Approach Delay		28.5		33.5			11.4			10.3	
Approach LOS		C		C			B			B	

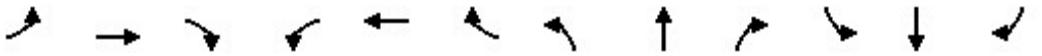
Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 90.9	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 13.0	Intersection LOS: B
Intersection Capacity Utilization 52.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	26	102	174	93	95	47	2306	180	43	1870	28
v/c Ratio	0.16	0.35	0.53	0.19	0.06	0.24	0.59	0.12	0.20	0.47	0.02
Control Delay	47.6	23.6	49.0	38.6	0.1	47.1	11.5	0.2	45.3	9.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.6	23.6	49.0	38.6	0.1	47.1	11.5	0.2	45.3	9.7	0.0
Queue Length 50th (ft)	8	12	37	25	0	14	248	0	13	177	0
Queue Length 95th (ft)	22	38	63	54	0	34	311	0	30	221	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	161	663	331	770	1500	204	4007	1500	246	4096	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.15	0.53	0.12	0.06	0.23	0.58	0.12	0.17	0.46	0.02

Intersection Summary



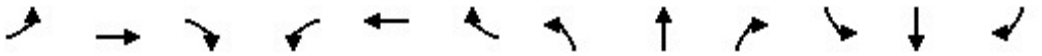
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	38	62	171	91	93	46	2260	176	42	1833	27
Future Volume (veh/h)	25	38	62	171	91	93	46	2260	176	42	1833	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	26	39	63	174	93	0	47	2306	0	43	1870	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	80	117	104	268	369		117	3672		111	3660	
Arrive On Green	0.03	0.07	0.07	0.07	0.11	0.00	0.04	0.60	0.00	0.04	0.60	0.00
Sat Flow, veh/h	2910	1683	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	26	39	63	174	93	0	47	2306	0	43	1870	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	0.7	1.8	3.3	3.5	2.0	0.0	1.3	19.6	0.0	1.2	14.3	0.0
Cycle Q Clear(g_c), s	0.7	1.8	3.3	3.5	2.0	0.0	1.3	19.6	0.0	1.2	14.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	80	117	104	268	369		117	3672		111	3660	
V/C Ratio(X)	0.33	0.33	0.60	0.65	0.25		0.40	0.63		0.39	0.51	
Avail Cap(c_a), veh/h	180	374	334	368	853		227	4437		273	4535	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.6	35.9	36.6	36.8	33.0	0.0	37.9	10.3	0.0	38.0	9.3	0.0
Incr Delay (d2), s/veh	2.4	1.7	5.5	2.7	0.4	0.0	2.2	0.2	0.0	2.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.8	1.3	1.2	0.8	0.0	0.5	5.7	0.0	0.4	4.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.0	37.5	42.1	39.4	33.3	0.0	40.1	10.5	0.0	40.2	9.4	0.0
LnGrp LOS	D	D	D	D	C		D	B		D	A	
Approach Vol, veh/h		128			267	A		2353	A		1913	A
Approach Delay, s/veh		40.5			37.3			11.1			10.1	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.6	53.2	10.0	10.1	7.8	53.1	6.7	13.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.6	58.9	7.5	18.0	6.3	60.2	5.0	20.5
Max Q Clear Time (g_c+I1), s	3.2	21.6	5.5	5.3	3.3	16.3	2.7	4.0
Green Ext Time (p_c), s	0.0	27.2	0.1	0.4	0.0	22.8	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	13.0
HCM 6th LOS	B

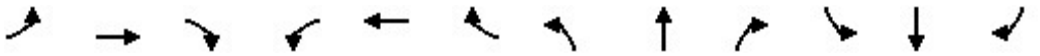
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.933			0.949						0.998	
Flt Protected	0.950	0.973			0.970		0.950			0.950		
Satd. Flow (prot)	1593	1522	0	0	1624	0	1676	4818	0	1676	4808	0
Flt Permitted	0.950	0.973					0.950			0.950		
Satd. Flow (perm)	1593	1522	0	0	1675	0	1676	4818	0	1676	4808	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		95			95						2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



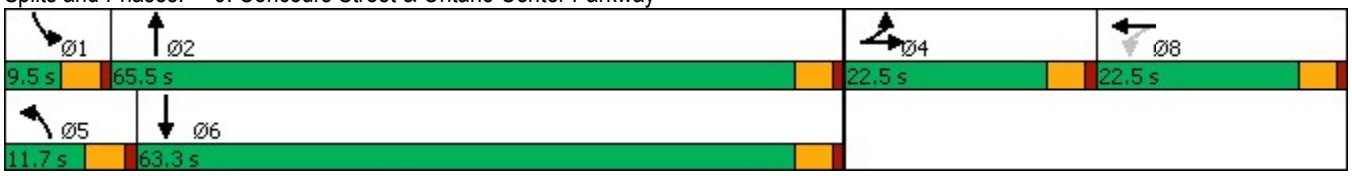
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	45	0	12	14	0	9	4	1731	5	1	1044	14
Future Volume (vph)	45	0	12	14	0	9	4	1731	5	1	1044	14
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	47	0	13	15	0	9	4	1822	5	1	1099	15
Shared Lane Traffic (%)	35%											
Lane Group Flow (vph)	31	29	0	0	24	0	4	1827	0	1	1114	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	45	0	14	0	4	1731	1	1044
Future Volume (vph)	45	0	14	0	4	1731	1	1044
Turn Type	Split	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	4	4		8	5	2	1	6
Permitted Phases			8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	11.7	65.5	9.5	63.3
Total Split (%)	18.8%	18.8%	18.8%	18.8%	9.8%	54.6%	7.9%	52.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	7.6	7.6		6.1	6.3	56.2	5.5	56.0
Actuated g/C Ratio	0.11	0.11		0.09	0.09	0.81	0.08	0.81
v/c Ratio	0.18	0.12		0.10	0.03	0.47	0.01	0.29
Control Delay	38.4	0.9		0.9	39.5	6.0	41.0	4.9
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	38.4	0.9		0.9	39.5	6.0	41.0	4.9
LOS	D	A		A	D	A	D	A
Approach Delay		20.3		0.9		6.0		4.9
Approach LOS		C		A		A		A

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 69.3	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 5.9	Intersection LOS: A
Intersection Capacity Utilization 51.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	31	29	24	4	1827	1	1114
v/c Ratio	0.18	0.12	0.10	0.03	0.47	0.01	0.29
Control Delay	38.4	0.9	0.9	39.5	6.0	41.0	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.4	0.9	0.9	39.5	6.0	41.0	4.9
Queue Length 50th (ft)	14	0	0	2	77	0	38
Queue Length 95th (ft)	49	0	0	13	286	6	152
Internal Link Dist (ft)		319	68		111		176
Turn Bay Length (ft)	170			115		120	
Base Capacity (vph)	455	502	546	191	4049	133	3976
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.06	0.04	0.02	0.45	0.01	0.28

Intersection Summary

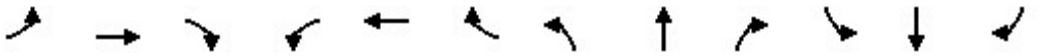
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	0	12	14	0	9	4	1731	5	1	1044	14
Future Volume (veh/h)	45	0	12	14	0	9	4	1731	5	1	1044	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	30	24	13	15	0	9	4	1822	5	1	1099	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	95	61	33	28	0	17	9	3046	8	3	2988	41
Arrive On Green	0.06	0.06	0.06	0.03	0.00	0.03	0.01	0.61	0.61	0.00	0.61	0.61
Sat Flow, veh/h	1688	1081	586	1008	0	605	1688	4981	14	1688	4918	67
Grp Volume(v), veh/h	30	0	37	24	0	0	4	1180	647	1	721	393
Grp Sat Flow(s),veh/h/ln	1688	0	1667	1613	0	0	1688	1612	1769	1688	1612	1760
Q Serve(g_s), s	1.0	0.0	1.3	0.9	0.0	0.0	0.1	13.3	13.3	0.0	6.7	6.7
Cycle Q Clear(g_c), s	1.0	0.0	1.3	0.9	0.0	0.0	0.1	13.3	13.3	0.0	6.7	6.7
Prop In Lane	1.00		0.35	0.62		0.37	1.00		0.01	1.00		0.04
Lane Grp Cap(c), veh/h	95	0	94	44	0	0	9	1972	1082	3	1960	1069
V/C Ratio(X)	0.32	0.00	0.39	0.54	0.00	0.00	0.44	0.60	0.60	0.35	0.37	0.37
Avail Cap(c_a), veh/h	512	0	505	489	0	0	205	3313	1818	142	3194	1743
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.9	0.0	27.0	28.5	0.0	0.0	29.4	7.1	7.1	29.6	5.9	5.9
Incr Delay (d2), s/veh	1.9	0.0	2.7	9.8	0.0	0.0	30.2	0.3	0.5	61.4	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.5	0.4	0.0	0.0	0.1	3.4	3.8	0.1	1.7	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.8	0.0	29.7	38.3	0.0	0.0	59.6	7.4	7.6	91.0	6.0	6.1
LnGrp LOS	C	A	C	D	A	A	E	A	A	F	A	A
Approach Vol, veh/h		67			24			1831			1115	
Approach Delay, s/veh		29.3			38.3			7.6			6.1	
Approach LOS		C			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	40.8		7.8	4.8	40.6		6.1				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	61.0		18.0	7.2	58.8		18.0				
Max Q Clear Time (g_c+I1), s	2.0	15.3		3.3	2.1	8.7		2.9				
Green Ext Time (p_c), s	0.0	21.0		0.2	0.0	9.8		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	7.7
HCM 6th LOS	A

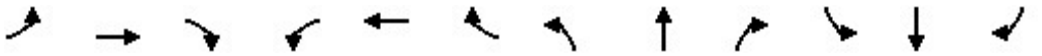
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			193			193			193			193
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



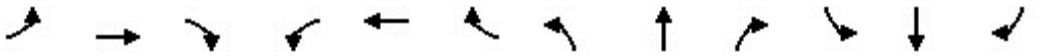
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	326	128	138	166	66	112	179	1599	125	177	1191	124
Future Volume (vph)	326	128	138	166	66	112	179	1599	125	177	1191	124
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	340	133	144	173	69	117	186	1666	130	184	1241	129
Shared Lane Traffic (%)												
Lane Group Flow (vph)	340	133	144	173	69	117	186	1666	130	184	1241	129

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	326	128	138	166	66	112	179	1599	125	177	1191	124
Future Volume (vph)	326	128	138	166	66	112	179	1599	125	177	1191	124
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	24.1	26.7		19.9	22.5		19.8	48.4		15.0	43.6	
Total Split (%)	21.9%	24.3%		18.1%	20.5%		18.0%	44.0%		13.6%	39.6%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	17.8	11.6	89.5	10.9	7.4	89.5	11.3	38.7	89.5	9.8	37.2	89.5
Actuated g/C Ratio	0.20	0.13	1.00	0.12	0.08	1.00	0.13	0.43	1.00	0.11	0.42	1.00
v/c Ratio	0.59	0.31	0.10	0.49	0.25	0.08	0.51	0.63	0.09	0.58	0.49	0.09
Control Delay	39.8	39.2	0.1	43.8	44.2	0.1	43.6	21.5	0.1	48.3	20.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	39.2	0.1	43.8	44.2	0.1	43.6	21.5	0.1	48.3	20.6	0.1
LOS	D	D	A	D	D	A	D	C	A	D	C	A
Approach Delay		30.4			29.6			22.1			22.2	
Approach LOS		C			C			C			C	

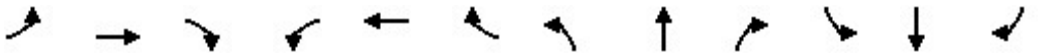
Intersection Summary		
Cycle Length: 110		
Actuated Cycle Length: 89.5		
Natural Cycle: 80		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.63		
Intersection Signal Delay: 23.9	Intersection LOS: C	
Intersection Capacity Utilization 60.7%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 10: Milliken Avenue & Concours Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	340	133	144	173	69	117	186	1666	130	184	1241	129
v/c Ratio	0.59	0.31	0.10	0.49	0.25	0.08	0.51	0.63	0.09	0.58	0.49	0.09
Control Delay	39.8	39.2	0.1	43.8	44.2	0.1	43.6	21.5	0.1	48.3	20.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	39.2	0.1	43.8	44.2	0.1	43.6	21.5	0.1	48.3	20.6	0.1
Queue Length 50th (ft)	100	38	0	51	21	0	55	214	0	55	148	0
Queue Length 95th (ft)	151	70	0	87	44	0	91	278	0	95	211	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	648	851	1500	509	690	1500	506	3049	1500	347	2778	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.16	0.10	0.34	0.10	0.08	0.37	0.55	0.09	0.53	0.45	0.09

Intersection Summary



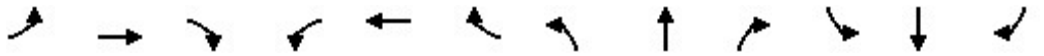
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	326	128	138	166	66	112	179	1599	125	177	1191	124
Future Volume (veh/h)	326	128	138	166	66	112	179	1599	125	177	1191	124
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	340	133	0	173	69	0	186	1666	0	184	1241	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	440	447		254	231		269	2699		261	2682	
Arrive On Green	0.15	0.13	0.00	0.09	0.07	0.00	0.09	0.44	0.00	0.09	0.44	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	340	133	0	173	69	0	186	1666	0	184	1241	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	8.2	2.6	0.0	4.2	1.4	0.0	4.5	15.2	0.0	4.5	10.4	0.0
Cycle Q Clear(g_c), s	8.2	2.6	0.0	4.2	1.4	0.0	4.5	15.2	0.0	4.5	10.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	440	447		254	231		269	2699		261	2682	
V/C Ratio(X)	0.77	0.30		0.68	0.30		0.69	0.62		0.71	0.46	
Avail Cap(c_a), veh/h	785	1028		617	834		613	3681		420	3279	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.6	28.5	0.0	32.2	32.2	0.0	32.0	15.5	0.0	32.2	14.3	0.0
Incr Delay (d2), s/veh	2.9	0.4	0.0	3.2	0.7	0.0	3.2	0.2	0.0	3.5	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	1.0	0.0	1.5	0.6	0.0	1.7	4.8	0.0	1.6	3.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.6	28.8	0.0	35.4	32.9	0.0	35.2	15.8	0.0	35.7	14.4	0.0
LnGrp LOS	C	C		D	C		D	B		D	B	
Approach Vol, veh/h		473	A		242	A		1852	A		1425	A
Approach Delay, s/veh		31.5			34.7			17.7			17.2	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	36.7	10.8	14.2	11.2	36.5	15.5	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	43.9	15.4	22.2	15.3	39.1	19.6	18.0
Max Q Clear Time (g_c+I1), s	6.5	17.2	6.2	4.6	6.5	12.4	10.2	3.4
Green Ext Time (p_c), s	0.2	15.0	0.3	0.6	0.4	10.5	0.8	0.2

Intersection Summary	
HCM 6th Ctrl Delay	20.2
HCM 6th LOS	C

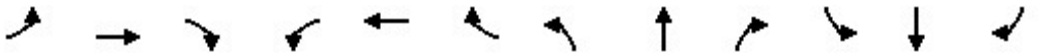
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55			177			241			177
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



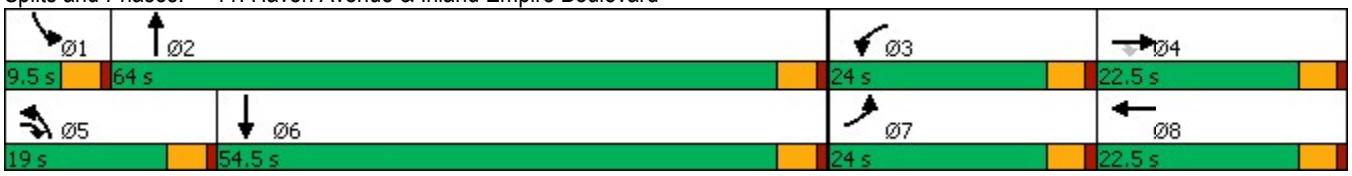
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	163	210	464	613	151	39	338	1821	418	40	2129	44
Future Volume (vph)	163	210	464	613	151	39	338	1821	418	40	2129	44
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	175	226	499	659	162	42	363	1958	449	43	2289	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	175	226	499	659	162	42	363	1958	449	43	2289	47

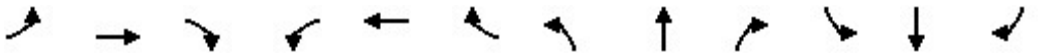
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	210	464	613	151	39	338	1821	418	40	2129	44
Future Volume (vph)	163	210	464	613	151	39	338	1821	418	40	2129	44
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	24.0	22.5	19.0	24.0	22.5		19.0	64.0		9.5	54.5	
Total Split (%)	20.0%	18.8%	15.8%	20.0%	18.8%		15.8%	53.3%		7.9%	45.4%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	12.2	13.0	32.0	19.5	20.3	115.1	14.5	61.5	115.1	5.0	50.0	115.1
Actuated g/C Ratio	0.11	0.11	0.28	0.17	0.18	1.00	0.13	0.53	1.00	0.04	0.43	1.00
v/c Ratio	0.57	0.60	1.09	0.99	0.27	0.03	1.00	0.60	0.30	0.34	0.87	0.03
Control Delay	56.4	55.3	104.9	80.0	43.0	0.0	97.5	20.1	0.5	62.1	34.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.4	55.3	104.9	80.0	43.0	0.0	97.5	20.1	0.5	62.1	34.2	0.0
LOS	E	E	F	F	D	A	F	C	A	E	C	A
Approach Delay		83.0			69.2			27.1			34.1	
Approach LOS		F			E			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 115.1	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 42.0	Intersection LOS: D
Intersection Capacity Utilization 88.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard



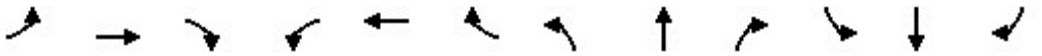


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	175	226	499	659	162	42	363	1958	449	43	2289	47
v/c Ratio	0.57	0.60	1.09	0.99	0.27	0.03	1.00	0.60	0.30	0.34	0.87	0.03
Control Delay	56.4	55.3	104.9	80.0	43.0	0.0	97.5	20.1	0.5	62.1	34.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.4	55.3	104.9	80.0	43.0	0.0	97.5	20.1	0.5	62.1	34.2	0.0
Queue Length 50th (ft)	64	85	~387	174	55	0	140	289	0	16	437	0
Queue Length 95th (ft)	101	126	#587	#271	91	0	#251	352	0	36	522	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	490	524	457	668	591	1500	364	3244	1500	125	2639	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.43	1.09	0.99	0.27	0.03	1.00	0.60	0.30	0.34	0.87	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



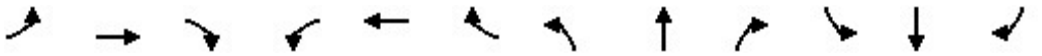
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	210	464	613	151	39	338	1821	418	40	2129	44
Future Volume (veh/h)	163	210	464	613	151	39	338	1821	418	40	2129	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	175	226	499	659	162	0	363	1958	0	43	2289	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	229	507	408	647	792		353	3071		93	2525	
Arrive On Green	0.08	0.15	0.15	0.16	0.24	0.00	0.12	0.50	0.00	0.03	0.41	0.00
Sat Flow, veh/h	2910	3367	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	175	226	499	659	162	0	363	1958	0	43	2289	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	7.0	7.3	18.0	19.5	4.6	0.0	14.5	28.1	0.0	1.7	42.1	0.0
Cycle Q Clear(g_c), s	7.0	7.3	18.0	19.5	4.6	0.0	14.5	28.1	0.0	1.7	42.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	229	507	408	647	792		353	3071		93	2525	
V/C Ratio(X)	0.76	0.45	1.22	1.02	0.20		1.03	0.64		0.46	0.91	
Avail Cap(c_a), veh/h	475	507	408	647	792		353	3071		122	2550	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	54.0	46.2	43.5	50.0	36.7	0.0	52.5	21.7	0.0	56.9	32.8	0.0
Incr Delay (d2), s/veh	5.3	0.6	120.1	40.1	0.1	0.0	55.3	0.4	0.0	3.6	5.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	3.1	25.6	8.8	1.9	0.0	8.0	9.9	0.0	0.7	16.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.2	46.8	163.6	90.1	36.9	0.0	107.8	22.1	0.0	60.5	38.0	0.0
LnGrp LOS	E	D	F	F	D		F	C		E	D	
Approach Vol, veh/h		900			821	A		2321	A		2332	A
Approach Delay, s/veh		114.0			79.6			35.5			38.4	
Approach LOS		F			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.3	64.7	24.0	22.5	19.0	54.0	13.9	32.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	59.5	19.5	18.0	14.5	50.0	19.5	18.0
Max Q Clear Time (g_c+I1), s	3.7	30.1	21.5	20.0	16.5	44.1	9.0	6.6
Green Ext Time (p_c), s	0.0	19.2	0.0	0.0	0.0	5.4	0.4	0.6

Intersection Summary	
HCM 6th Ctrl Delay	53.3
HCM 6th LOS	D

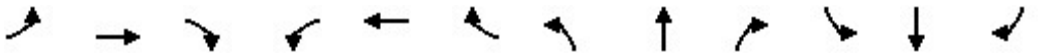
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			326			177			177			177
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



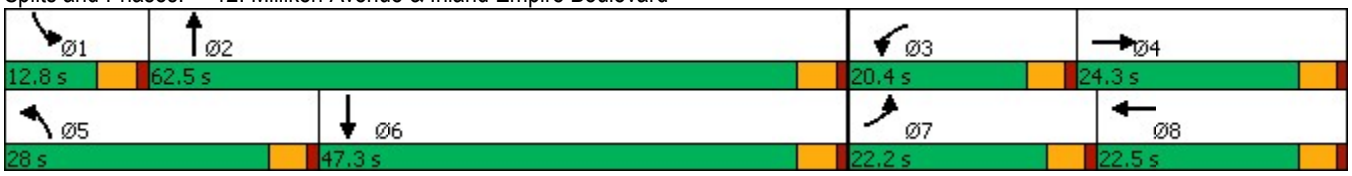
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	283	276	310	204	75	83	376	1528	351	93	1350	114
Future Volume (vph)	283	276	310	204	75	83	376	1528	351	93	1350	114
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	298	291	326	215	79	87	396	1608	369	98	1421	120
Shared Lane Traffic (%)												
Lane Group Flow (vph)	298	291	326	215	79	87	396	1608	369	98	1421	120

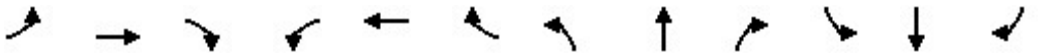
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	283	276	310	204	75	83	376	1528	351	93	1350	114
Future Volume (vph)	283	276	310	204	75	83	376	1528	351	93	1350	114
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	22.2	24.3		20.4	22.5		28.0	62.5		12.8	47.3	
Total Split (%)	18.5%	20.3%		17.0%	18.8%		23.3%	52.1%		10.7%	39.4%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	18.4	14.4	100.5	12.8	11.7	100.5	18.9	49.7	100.5	7.9	35.8	100.5
Actuated g/C Ratio	0.18	0.14	1.00	0.13	0.12	1.00	0.19	0.49	1.00	0.08	0.36	1.00
v/c Ratio	0.56	0.60	0.22	0.59	0.20	0.06	0.73	0.54	0.25	0.43	0.66	0.08
Control Delay	46.6	48.1	0.3	51.0	44.5	0.1	48.8	19.3	0.4	55.4	29.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	48.1	0.3	51.0	44.5	0.1	48.8	19.3	0.4	55.4	29.5	0.1
LOS	D	D	A	D	D	A	D	B	A	E	C	A
Approach Delay		30.6			38.1			21.3			28.9	
Approach LOS		C			D			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.5	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 26.4	Intersection LOS: C
Intersection Capacity Utilization 63.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	298	291	326	215	79	87	396	1608	369	98	1421	120
v/c Ratio	0.56	0.60	0.22	0.59	0.20	0.06	0.73	0.54	0.25	0.43	0.66	0.08
Control Delay	46.6	48.1	0.3	51.0	44.5	0.1	48.8	19.3	0.4	55.4	29.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	48.1	0.3	51.0	44.5	0.1	48.8	19.3	0.4	55.4	29.5	0.1
Queue Length 50th (ft)	95	95	0	69	25	0	126	212	0	31	222	0
Queue Length 95th (ft)	164	156	0	122	52	0	204	283	0	67	308	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	564	682	1500	472	620	1500	699	3622	1500	246	2673	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.43	0.22	0.46	0.13	0.06	0.57	0.44	0.25	0.40	0.53	0.08

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	283	276	310	204	75	83	376	1528	351	93	1350	114
Future Volume (veh/h)	283	276	310	204	75	83	376	1528	351	93	1350	114
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	298	291	0	215	79	0	396	1608	0	98	1421	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	386	422		296	319		496	2964		164	2268	
Arrive On Green	0.13	0.13	0.00	0.10	0.09	0.00	0.17	0.49	0.00	0.06	0.37	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	298	291	0	215	79	0	396	1608	0	98	1421	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	7.7	6.5	0.0	5.6	1.7	0.0	10.2	14.4	0.0	2.6	14.9	0.0
Cycle Q Clear(g_c), s	7.7	6.5	0.0	5.6	1.7	0.0	10.2	14.4	0.0	2.6	14.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	386	422		296	319		496	2964		164	2268	
V/C Ratio(X)	0.77	0.69		0.73	0.25		0.80	0.54		0.60	0.63	
Avail Cap(c_a), veh/h	659	852		592	775		874	4521		309	3336	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.8	32.7	0.0	34.1	32.8	0.0	31.1	14.0	0.0	36.0	20.1	0.0
Incr Delay (d2), s/veh	3.3	2.0	0.0	3.4	0.4	0.0	3.0	0.2	0.0	3.5	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	2.7	0.0	2.1	0.7	0.0	3.7	4.5	0.0	1.0	5.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.1	34.7	0.0	37.4	33.2	0.0	34.1	14.2	0.0	39.5	20.4	0.0
LnGrp LOS	D	C		D	C		C	B		D	C	
Approach Vol, veh/h		589	A		294	A		2004	A		1519	A
Approach Delay, s/veh		35.4			36.3			18.1			21.6	
Approach LOS		D			D			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.9	42.5	12.5	14.3	17.8	33.6	14.9	11.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.3	58.0	15.9	19.8	23.5	42.8	17.7	18.0
Max Q Clear Time (g_c+I1), s	4.6	16.4	7.6	8.5	12.2	16.9	9.7	3.7
Green Ext Time (p_c), s	0.1	17.7	0.4	1.3	1.1	12.2	0.6	0.3

Intersection Summary	
HCM 6th Ctrl Delay	22.9
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.983	0.850				
Flt Protected	0.957					
Satd. Flow (prot)	3042	1365	6071	0	0	6071
Flt Permitted	0.957					
Satd. Flow (perm)	3042	1365	6071	0	0	6071
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	4	4				
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	479	302	2147	0	0	2178
Future Volume (vph)	479	302	2147	0	0	2178
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	499	315	2236	0	0	2269
Shared Lane Traffic (%)		20%				
Lane Group Flow (vph)	562	252	2236	0	0	2269

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	479	302	2147	2178
Future Volume (vph)	479	302	2147	2178
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	41.0	41.0
Total Split (%)	36.9%	36.9%	63.1%	63.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	16.2	16.2	36.4	36.4
Actuated g/C Ratio	0.26	0.26	0.59	0.59
v/c Ratio	0.70	0.70	0.62	0.63
Control Delay	25.4	31.2	9.6	9.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.4	31.2	9.6	9.7
LOS	C	C	A	A
Approach Delay	27.2		9.6	9.7
Approach LOS	C		A	A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 61.6	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 12.3	Intersection LOS: B
Intersection Capacity Utilization 62.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	562	252	2236	2269
v/c Ratio	0.70	0.70	0.62	0.63
Control Delay	25.4	31.2	9.6	9.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.4	31.2	9.6	9.7
Queue Length 50th (ft)	96	91	145	148
Queue Length 95th (ft)	144	169	198	202
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	969	436	3611	3611
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.58	0.62	0.63

Intersection Summary

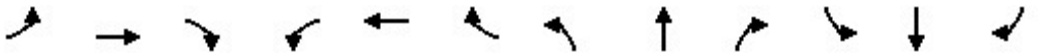
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	479	302	2147	0	0	2178
Future Volume (veh/h)	479	302	2147	0	0	2178
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1673	1772	1772	0	0	1772
Adj Flow Rate, veh/h	540	271	2236	0	0	2269
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	773	364	3615	0	0	3615
Arrive On Green	0.24	0.24	0.59	0.00	0.00	0.59
Sat Flow, veh/h	3188	1502	6592	0	0	6592
Grp Volume(v), veh/h	540	271	2236	0	0	2269
Grp Sat Flow(s),veh/h/ln	1594	1502	1524	0	0	1524
Q Serve(g_s), s	8.4	9.1	12.9	0.0	0.0	13.2
Cycle Q Clear(g_c), s	8.4	9.1	12.9	0.0	0.0	13.2
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	773	364	3615	0	0	3615
V/C Ratio(X)	0.70	0.74	0.62	0.00	0.00	0.63
Avail Cap(c_a), veh/h	1137	536	4070	0	0	4070
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	18.9	19.1	7.2	0.0	0.0	7.2
Incr Delay (d2), s/veh	1.2	3.2	0.2	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	3.2	3.0	0.0	0.0	3.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.0	22.3	7.4	0.0	0.0	7.5
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	811		2236			2269
Approach Delay, s/veh	20.8		7.4			7.5
Approach LOS	C		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		36.9			36.9	17.7
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		36.5			36.5	19.5
Max Q Clear Time (g_c+I1), s		14.9			15.2	11.1
Green Ext Time (p_c), s		17.2			17.2	2.1

Intersection Summary	
HCM 6th Ctrl Delay	9.5
HCM 6th LOS	A

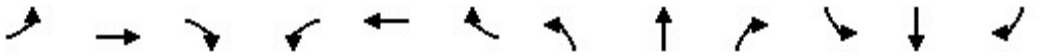
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			147			136			294			60
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



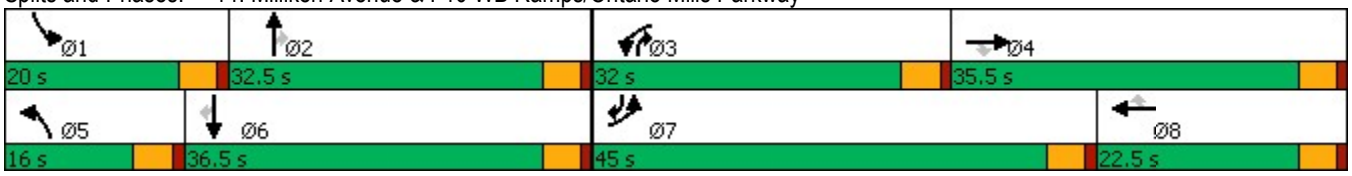
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	745	189	228	243	289	61	231	980	435	319	1031	460
Future Volume (vph)	745	189	228	243	289	61	231	980	435	319	1031	460
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	776	197	238	253	301	64	241	1021	453	332	1074	479
Shared Lane Traffic (%)												
Lane Group Flow (vph)	776	197	238	253	301	64	241	1021	453	332	1074	479

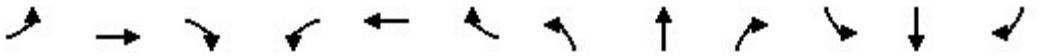
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	745	189	228	243	289	61	231	980	435	319	1031	460
Future Volume (vph)	745	189	228	243	289	61	231	980	435	319	1031	460
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	45.0	35.5	35.5	32.0	22.5	22.5	16.0	32.5	32.0	20.0	36.5	45.0
Total Split (%)	37.5%	29.6%	29.6%	26.7%	18.8%	18.8%	13.3%	27.1%	26.7%	16.7%	30.4%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	34.6	34.1	34.1	15.3	14.8	14.8	11.5	25.6	45.5	15.2	29.3	68.4
Actuated g/C Ratio	0.32	0.31	0.31	0.14	0.14	0.14	0.11	0.24	0.42	0.14	0.27	0.63
v/c Ratio	0.84	0.36	0.42	0.62	0.66	0.20	0.79	0.71	0.57	0.82	0.66	0.49
Control Delay	44.4	32.0	14.5	52.0	53.2	1.4	68.5	42.1	11.1	64.8	38.1	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.4	32.0	14.5	52.0	53.2	1.4	68.5	42.1	11.1	64.8	38.1	11.3
LOS	D	C	B	D	D	A	E	D	B	E	D	B
Approach Delay		36.5			47.3			37.6			36.0	
Approach LOS		D			D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108.5	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 37.9	Intersection LOS: D
Intersection Capacity Utilization 74.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway

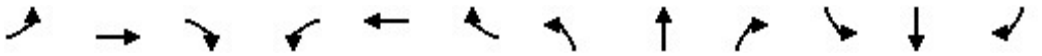




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	776	197	238	253	301	64	241	1021	453	332	1074	479
v/c Ratio	0.84	0.36	0.42	0.62	0.66	0.20	0.79	0.71	0.57	0.82	0.66	0.49
Control Delay	44.4	32.0	14.5	52.0	53.2	1.4	68.5	42.1	11.1	64.8	38.1	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.4	32.0	14.5	52.0	53.2	1.4	68.5	42.1	11.1	64.8	38.1	11.3
Queue Length 50th (ft)	270	109	48	92	112	0	91	200	79	125	202	144
Queue Length 95th (ft)	357	186	124	135	164	0	#170	253	176	#215	256	233
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	1098	581	593	745	565	366	311	1594	940	420	1821	1056
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.34	0.40	0.34	0.53	0.17	0.77	0.64	0.48	0.79	0.59	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	745	189	228	243	289	61	231	980	435	319	1031	460
Future Volume (veh/h)	745	189	228	243	289	61	231	980	435	319	1031	460
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	776	197	238	253	301	64	241	1021	453	332	1074	479
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	871	541	459	325	397	177	295	1667	578	389	1862	908
Arrive On Green	0.30	0.31	0.31	0.11	0.12	0.12	0.10	0.27	0.27	0.13	0.31	0.31
Sat Flow, veh/h	2910	1772	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	776	197	238	253	301	64	241	1021	453	332	1074	479
Grp Sat Flow(s),veh/h/ln	1455	1772	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	26.1	8.9	13.4	8.7	8.9	4.0	8.3	15.0	27.2	11.4	15.2	19.0
Cycle Q Clear(g_c), s	26.1	8.9	13.4	8.7	8.9	4.0	8.3	15.0	27.2	11.4	15.2	19.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	871	541	459	325	397	177	295	1667	578	389	1862	908
V/C Ratio(X)	0.89	0.36	0.52	0.78	0.76	0.36	0.82	0.61	0.78	0.85	0.58	0.53
Avail Cap(c_a), veh/h	1151	541	459	782	592	264	327	1667	578	440	1905	919
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.3	27.8	29.3	44.3	43.8	41.6	45.1	32.5	27.7	43.4	30.0	11.7
Incr Delay (d2), s/veh	7.2	0.4	1.0	4.1	3.2	1.2	13.6	0.7	7.0	13.7	0.4	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.9	3.8	4.9	3.3	3.8	1.5	3.5	5.5	10.6	4.8	5.6	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.5	28.2	30.4	48.3	46.9	42.9	58.7	33.1	34.7	57.1	30.4	12.3
LnGrp LOS	D	C	C	D	D	D	E	C	C	E	C	B
Approach Vol, veh/h		1211			618			1715			1885	
Approach Delay, s/veh		37.1			47.1			37.1			30.5	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.2	32.5	15.9	35.8	14.9	35.8	35.2	16.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	28.0	27.5	31.0	11.5	32.0	40.5	18.0
Max Q Clear Time (g_c+I1), s	13.4	29.2	10.7	15.4	10.3	21.0	28.1	10.9
Green Ext Time (p_c), s	0.3	0.0	0.8	1.7	0.1	6.7	2.6	1.2

Intersection Summary	
HCM 6th Ctrl Delay	36.0
HCM 6th LOS	D

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.993	0.850				
Flt Protected	0.955					
Satd. Flow (prot)	3066	1365	0	6071	6071	0
Flt Permitted	0.955					
Satd. Flow (perm)	3066	1365	0	6071	6071	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	6	16				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

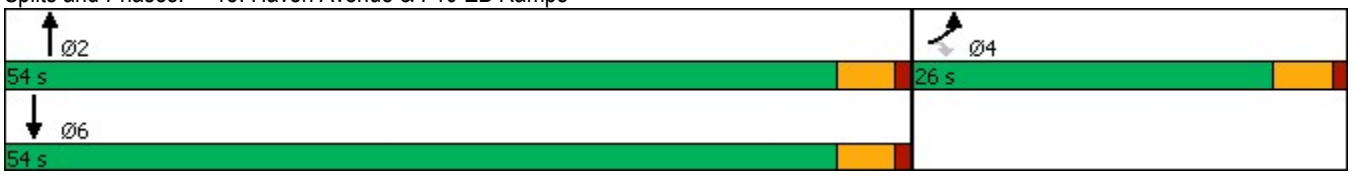
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	485	237	0	2369	1826	0
Future Volume (vph)	485	237	0	2369	1826	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	505	247	0	2468	1902	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	530	222	0	2468	1902	0

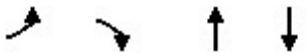
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	485	237	2369	1826
Future Volume (vph)	485	237	2369	1826
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	54.0	54.0
Total Split (%)	32.5%	32.5%	67.5%	67.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	18.0	18.0	49.1	49.1
Actuated g/C Ratio	0.24	0.24	0.65	0.65
v/c Ratio	0.73	0.66	0.63	0.49
Control Delay	32.8	34.8	9.4	7.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	32.8	34.8	9.4	7.8
LOS	C	C	A	A
Approach Delay	33.4		9.4	7.8
Approach LOS	C		A	A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 76.1	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 12.3	Intersection LOS: B
Intersection Capacity Utilization 62.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	530	222	2468	1902
v/c Ratio	0.73	0.66	0.63	0.49
Control Delay	32.8	34.8	9.4	7.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	32.8	34.8	9.4	7.8
Queue Length 50th (ft)	119	97	186	123
Queue Length 95th (ft)	170	176	243	163
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	873	398	3964	3964
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.61	0.56	0.62	0.48

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	485	237	0	2369	1826	0
Future Volume (veh/h)	485	237	0	2369	1826	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1772	0	1772	1772	0
Adj Flow Rate, veh/h	505	247	0	2468	1902	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	686	323	0	3962	3962	0
Arrive On Green	0.22	0.22	0.00	0.65	0.65	0.00
Sat Flow, veh/h	3188	1502	0	6592	6592	0
Grp Volume(v), veh/h	505	247	0	2468	1902	0
Grp Sat Flow(s),veh/h/ln	1594	1502	0	1524	1524	0
Q Serve(g_s), s	9.9	10.3	0.0	15.9	10.6	0.0
Cycle Q Clear(g_c), s	9.9	10.3	0.0	15.9	10.6	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	686	323	0	3962	3962	0
V/C Ratio(X)	0.74	0.76	0.00	0.62	0.48	0.00
Avail Cap(c_a), veh/h	1026	483	0	4518	4518	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.4	24.6	0.0	6.9	5.9	0.0
Incr Delay (d2), s/veh	1.6	4.1	0.0	0.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	3.8	0.0	3.8	2.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.0	28.7	0.0	7.1	6.0	0.0
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	752			2468	1902	
Approach Delay, s/veh	26.9			7.1	6.0	
Approach LOS	C			A	A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		47.9		18.9		47.9
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		49.5		21.5		49.5
Max Q Clear Time (g_c+I1), s		17.9		12.3		12.6
Green Ext Time (p_c), s		25.5		2.1		21.3

Intersection Summary	
HCM 6th Ctrl Delay	9.6
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1600	1800	1600	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2891	1500	2891	6071	6071	1500
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2891	1500	2891	6071	6071	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		11				92
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	493	194	313	1159	978	540
Future Volume (vph)	493	194	313	1159	978	540
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	508	200	323	1195	1008	557
Shared Lane Traffic (%)						
Lane Group Flow (vph)	508	200	323	1195	1008	557

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	493	194	313	1159	978	540
Future Volume (vph)	493	194	313	1159	978	540
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	22.5	14.9	14.9	37.5	22.6	22.5
Total Split (%)	37.5%	24.8%	24.8%	62.5%	37.7%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	15.0	29.3	9.7	30.5	16.2	35.8
Actuated g/C Ratio	0.27	0.54	0.18	0.56	0.30	0.65
v/c Ratio	0.64	0.25	0.63	0.35	0.56	0.55
Control Delay	22.0	7.6	28.2	7.3	18.0	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	7.6	28.2	7.3	18.0	6.5
LOS	C	A	C	A	B	A
Approach Delay	17.9			11.7	13.9	
Approach LOS	B			B	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 54.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 13.8	Intersection LOS: B
Intersection Capacity Utilization 53.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

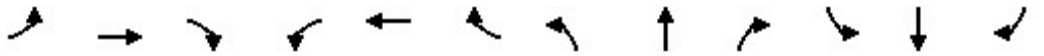
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	508	200	323	1195	1008	557
v/c Ratio	0.64	0.25	0.63	0.35	0.56	0.55
Control Delay	22.0	7.6	28.2	7.3	18.0	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	7.6	28.2	7.3	18.0	6.5
Queue Length 50th (ft)	79	32	55	59	84	63
Queue Length 95th (ft)	122	62	93	82	116	123
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	968	832	559	3728	2045	1099
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.24	0.58	0.32	0.49	0.51

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	493	194	313	1159	978	540
Future Volume (veh/h)	493	194	313	1159	978	540
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1772	1575	1772	1772	1772
Adj Flow Rate, veh/h	508	200	323	1195	1008	557
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	689	583	440	3556	2086	869
Arrive On Green	0.24	0.24	0.15	0.58	0.34	0.34
Sat Flow, veh/h	2910	1502	2910	6343	6343	1502
Grp Volume(v), veh/h	508	200	323	1195	1008	557
Grp Sat Flow(s),veh/h/ln	1455	1502	1455	1524	1524	1502
Q Serve(g_s), s	8.1	4.7	5.3	5.1	6.5	12.4
Cycle Q Clear(g_c), s	8.1	4.7	5.3	5.1	6.5	12.4
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	689	583	440	3556	2086	869
V/C Ratio(X)	0.74	0.34	0.73	0.34	0.48	0.64
Avail Cap(c_a), veh/h	1046	767	604	4017	2203	898
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.7	10.8	20.3	5.4	13.0	7.1
Incr Delay (d2), s/veh	1.6	0.3	3.0	0.1	0.2	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	4.5	1.8	1.1	1.9	5.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.2	11.2	23.2	5.5	13.2	8.5
LnGrp LOS	B	B	C	A	B	A
Approach Vol, veh/h	708			1518	1565	
Approach Delay, s/veh	16.9			9.2	11.5	
Approach LOS	B			A	B	

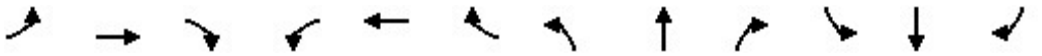
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		33.7		16.4	12.1	21.6
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		33.0		18.0	10.4	18.1
Max Q Clear Time (g_c+I1), s		7.1		10.1	7.3	14.4
Green Ext Time (p_c), s		9.9		1.8	0.4	2.7

Intersection Summary	
HCM 6th Ctrl Delay	11.6
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.972				0.850			0.850		0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4683	0	2891	3353	1500	2891	4818	1500	2891	6010	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4683	0	2891	3353	1500	2891	4818	1500	2891	6010	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		49				173			262		15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



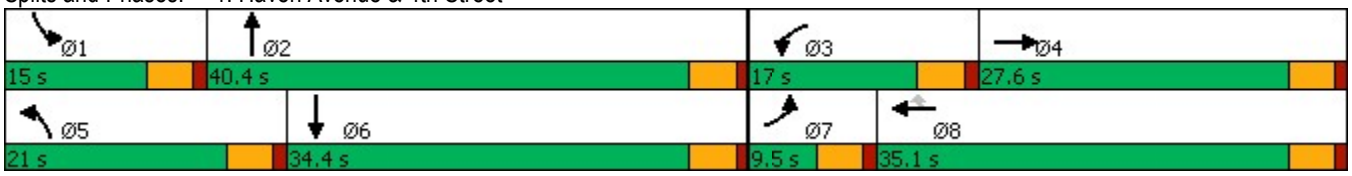
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	50	530	123	199	503	163	178	1103	347	169	1072	76
Future Volume (vph)	50	530	123	199	503	163	178	1103	347	169	1072	76
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	53	564	131	212	535	173	189	1173	369	180	1140	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	695	0	212	535	173	189	1173	369	180	1221	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	50	530	199	503	163	178	1103	347	169	1072
Future Volume (vph)	50	530	199	503	163	178	1103	347	169	1072
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	9.5	27.6	17.0	35.1	35.1	21.0	40.4		15.0	34.4
Total Split (%)	9.5%	27.6%	17.0%	35.1%	35.1%	21.0%	40.4%		15.0%	34.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	5.0	19.4	11.2	27.7	27.7	11.5	36.1	94.5	9.7	34.3
Actuated g/C Ratio	0.05	0.21	0.12	0.29	0.29	0.12	0.38	1.00	0.10	0.36
v/c Ratio	0.35	0.69	0.62	0.54	0.31	0.54	0.64	0.25	0.61	0.56
Control Delay	51.7	36.3	48.8	30.9	5.7	45.3	26.7	0.4	50.8	26.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.7	36.3	48.8	30.9	5.7	45.3	26.7	0.4	50.8	26.1
LOS	D	D	D	C	A	D	C	A	D	C
Approach Delay		37.4		30.3			23.1			29.2
Approach LOS		D		C			C			C

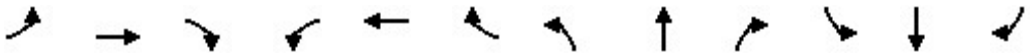
Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 94.5	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 28.5	Intersection LOS: C
Intersection Capacity Utilization 63.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Haven Avenue & 4th Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	53	695	212	535	173	189	1173	369	180	1221
v/c Ratio	0.35	0.69	0.62	0.54	0.31	0.54	0.64	0.25	0.61	0.56
Control Delay	51.7	36.3	48.8	30.9	5.7	45.3	26.7	0.4	50.8	26.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.7	36.3	48.8	30.9	5.7	45.3	26.7	0.4	50.8	26.1
Queue Length 50th (ft)	16	135	64	147	0	57	217	0	55	171
Queue Length 95th (ft)	37	178	105	200	47	91	280	0	93	231
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	153	1186	384	1090	604	507	1838	1500	322	2189
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.59	0.55	0.49	0.29	0.37	0.64	0.25	0.56	0.56

Intersection Summary



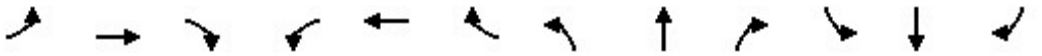
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	530	123	199	503	163	178	1103	347	169	1072	76
Future Volume (veh/h)	50	530	123	199	503	163	178	1103	347	169	1072	76
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	53	564	131	212	535	173	189	1173	0	180	1140	81
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	121	773	176	281	846	377	261	2007		245	2396	169
Arrive On Green	0.04	0.20	0.20	0.10	0.25	0.25	0.09	0.41	0.00	0.08	0.41	0.41
Sat Flow, veh/h	2910	3939	896	2910	3367	1502	2910	4837	1502	2910	5855	414
Grp Volume(v), veh/h	53	460	235	212	535	173	189	1173	0	180	889	332
Grp Sat Flow(s),veh/h/ln	1455	1612	1611	1455	1683	1502	1455	1612	1502	1455	1524	1697
Q Serve(g_s), s	1.5	11.6	11.9	6.1	12.2	8.4	5.5	16.2	0.0	5.2	12.3	12.4
Cycle Q Clear(g_c), s	1.5	11.6	11.9	6.1	12.2	8.4	5.5	16.2	0.0	5.2	12.3	12.4
Prop In Lane	1.00		0.56	1.00		1.00	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	121	633	316	281	846	377	261	2007		245	1871	695
V/C Ratio(X)	0.44	0.73	0.74	0.75	0.63	0.46	0.72	0.58		0.73	0.48	0.48
Avail Cap(c_a), veh/h	168	861	430	420	1191	531	555	2007		353	1871	695
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.5	32.6	32.7	38.1	28.8	27.4	38.3	19.6	0.0	38.7	18.7	18.8
Incr Delay (d2), s/veh	2.5	2.0	4.6	4.2	0.8	0.9	3.8	1.3	0.0	4.5	0.9	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	4.6	4.9	2.3	4.9	3.0	2.1	6.0	0.0	2.0	4.3	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.0	34.6	37.4	42.3	29.6	28.3	42.1	20.8	0.0	43.2	19.6	21.1
LnGrp LOS	D	C	D	D	C	C	D	C		D	B	C
Approach Vol, veh/h		748			920			1362	A		1401	
Approach Delay, s/veh		36.1			32.3			23.8			23.0	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.8	40.4	12.9	21.5	12.3	39.9	8.1	26.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	35.9	12.5	23.1	16.5	29.9	5.0	30.6
Max Q Clear Time (g_c+I1), s	7.2	18.2	8.1	13.9	7.5	14.4	3.5	14.2
Green Ext Time (p_c), s	0.2	8.0	0.3	3.1	0.4	7.4	0.0	3.9

Intersection Summary	
HCM 6th Ctrl Delay	27.4
HCM 6th LOS	C

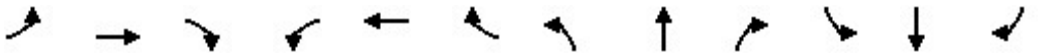
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.999				0.850			0.850		0.850	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	1667	6065	0	1583	4818	1500	1667	1765	1500	1583	2850	0
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	1667	6065	0	1583	4818	1500	1667	1765	1500	1583	2850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				153			387		401	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



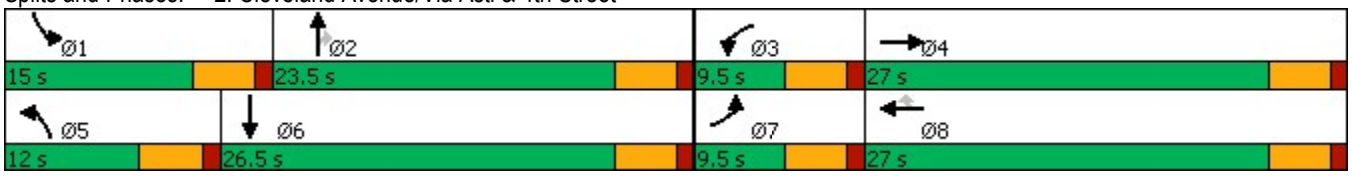
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	1125	4	3	877	4	0	0	4	3	0	1
Future Volume (vph)	0	1125	4	3	877	4	0	0	4	3	0	1
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1160	4	3	904	4	0	0	4	3	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1164	0	3	904	4	0	0	4	3	1	0

Intersection Summary

Lane Group	EBT	WBL	WBT	WBR	NBR	SBL	SBT	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	1125	3	877	4	4	3	0		
Future Volume (vph)	1125	3	877	4	4	3	0		
Turn Type	NA	Prot	NA	Perm	Perm	Prot	NA		
Protected Phases	4	3	8			1	6	5	7
Permitted Phases				8	2				
Detector Phase	4	3	8	8	2	1	6		
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	22.5	22.5	22.5	9.5	22.5	9.5	9.5
Total Split (s)	27.0	9.5	27.0	27.0	23.5	15.0	26.5	12.0	9.5
Total Split (%)	36.0%	12.7%	36.0%	36.0%	31.3%	20.0%	35.3%	16%	13%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		
Lead/Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	None	Min	None	None
Act Effct Green (s)	16.7	5.4	17.8	17.8	6.0	6.0	7.2		
Actuated g/C Ratio	0.48	0.16	0.51	0.51	0.17	0.17	0.21		
v/c Ratio	0.40	0.01	0.37	0.00	0.01	0.01	0.00		
Control Delay	7.3	19.0	5.6	0.0	0.0	18.0	0.0		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	7.3	19.0	5.6	0.0	0.0	18.0	0.0		
LOS	A	B	A	A	A	B	A		
Approach Delay	7.3		5.6				13.5		
Approach LOS	A		A				B		

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 34.8	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.40	
Intersection Signal Delay: 6.5	Intersection LOS: A
Intersection Capacity Utilization 36.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street



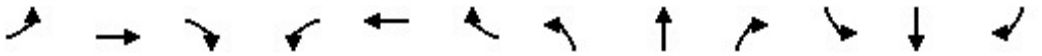
Lane Group	EBT	WBL	WBT	WBR	NBR	SBL	SBT
Lane Group Flow (vph)	1164	3	904	4	4	3	1
v/c Ratio	0.40	0.01	0.37	0.00	0.01	0.01	0.00
Control Delay	7.3	19.0	5.6	0.0	0.0	18.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	19.0	5.6	0.0	0.0	18.0	0.0
Queue Length 50th (ft)	24	1	24	0	0	1	0
Queue Length 95th (ft)	110	8	75	0	0	7	0
Internal Link Dist (ft)	2546		362				358
Turn Bay Length (ft)		130		145	165	50	
Base Capacity (vph)	4243	245	3530	1140	1044	517	2076
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.01	0.26	0.00	0.00	0.01	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1125	4	3	877	4	0	0	4	3	0	1
Future Volume (veh/h)	0	1125	4	3	877	4	0	0	4	3	0	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	0	1160	4	3	904	4	0	0	4	3	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	4	2394	8	7	2433	755	4	236	200	7	433	386
Arrive On Green	0.00	0.38	0.38	0.00	0.50	0.50	0.00	0.00	0.13	0.00	0.00	0.26
Sat Flow, veh/h	1594	6318	22	1594	4837	1502	1594	1772	1502	1594	1683	1502
Grp Volume(v), veh/h	0	839	325	3	904	4	0	0	4	3	0	1
Grp Sat Flow(s),veh/h/ln	1594	1524	1768	1594	1612	1502	1594	1772	1502	1594	1683	1502
Q Serve(g_s), s	0.0	5.2	5.2	0.1	4.3	0.0	0.0	0.0	0.1	0.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	5.2	5.2	0.1	4.3	0.0	0.0	0.0	0.1	0.1	0.0	0.0
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	4	1733	670	7	2433	755	4	236	200	7	433	386
V/C Ratio(X)	0.00	0.48	0.48	0.46	0.37	0.01	0.00	0.00	0.02	0.46	0.00	0.00
Avail Cap(c_a), veh/h	212	2741	1060	212	2900	900	318	897	760	446	987	880
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	8.9	8.9	18.6	5.7	4.6	0.0	0.0	14.1	18.6	0.0	10.4
Incr Delay (d2), s/veh	0.0	0.2	0.5	42.9	0.1	0.0	0.0	0.0	0.0	42.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.3	1.5	0.1	0.9	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	9.1	9.4	61.5	5.8	4.7	0.0	0.0	14.2	61.5	0.0	10.4
LnGrp LOS	A	A	A	E	A	A	A	A	B	E	A	B
Approach Vol, veh/h		1164			911			4			4	
Approach Delay, s/veh		9.2			6.0			14.2			48.7	
Approach LOS		A			A			B			D	

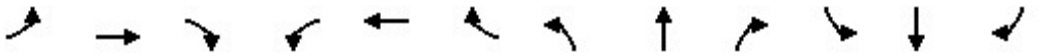
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	9.5	4.7	18.7	0.0	14.2	0.0	23.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	19.0	5.0	22.5	7.5	22.0	5.0	22.5
Max Q Clear Time (g_c+I1), s	2.1	2.1	2.1	7.2	0.0	2.0	0.0	6.3
Green Ext Time (p_c), s	0.0	0.0	0.0	7.0	0.0	0.0	0.0	5.8

Intersection Summary	
HCM 6th Ctrl Delay	7.9
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.993				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.953	
Satd. Flow (prot)	2891	6065	0	1583	4784	0	1583	1765	1500	0	1682	1500
Flt Permitted	0.950			0.950			0.726				0.731	
Satd. Flow (perm)	2891	6065	0	1583	4784	0	1210	1765	1500	0	1290	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			15				226			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



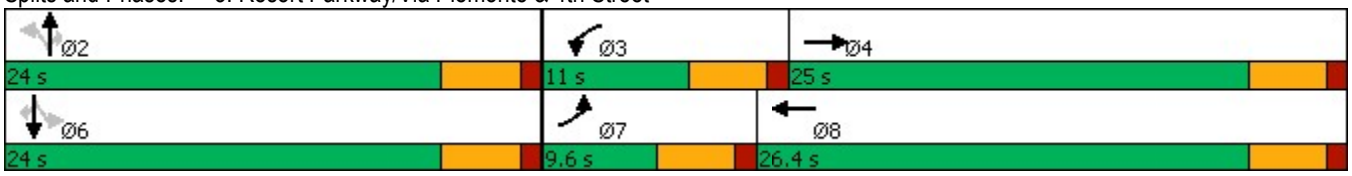
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	11	1106	8	5	850	45	3	0	8	45	1	15
Future Volume (vph)	11	1106	8	5	850	45	3	0	8	45	1	15
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	1140	8	5	876	46	3	0	8	46	1	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	1148	0	5	922	0	3	0	8	0	47	15

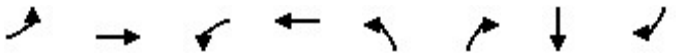
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	11	1106	5	850	3	8	45	1	15
Future Volume (vph)	11	1106	5	850	3	8	45	1	15
Turn Type	Prot	NA	Prot	NA	Perm	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8				6	
Permitted Phases					2	2	6		6
Detector Phase	7	4	3	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.6	25.0	11.0	26.4	24.0	24.0	24.0	24.0	24.0
Total Split (%)	16.0%	41.7%	18.3%	44.0%	40.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min
Act Effct Green (s)	5.4	16.2	6.0	16.3	7.0	7.0		7.0	7.0
Actuated g/C Ratio	0.16	0.48	0.18	0.48	0.21	0.21		0.21	0.21
v/c Ratio	0.02	0.40	0.02	0.40	0.01	0.02		0.18	0.04
Control Delay	16.8	6.9	16.4	6.8	14.3	0.0		15.8	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	16.8	6.9	16.4	6.8	14.3	0.0		15.8	0.2
LOS	B	A	B	A	B	A		B	A
Approach Delay		7.0		6.8				12.0	
Approach LOS		A		A				B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 34.1	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.40	
Intersection Signal Delay: 7.0	Intersection LOS: A
Intersection Capacity Utilization 38.0%	ICU Level of Service A
Analysis Period (min) 15	

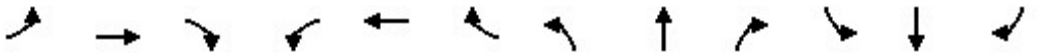
Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street





Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBT	SBR
Lane Group Flow (vph)	11	1148	5	922	3	8	47	15
v/c Ratio	0.02	0.40	0.02	0.40	0.01	0.02	0.18	0.04
Control Delay	16.8	6.9	16.4	6.8	14.3	0.0	15.8	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.8	6.9	16.4	6.8	14.3	0.0	15.8	0.2
Queue Length 50th (ft)	1	27	1	27	1	0	6	0
Queue Length 95th (ft)	7	88	9	89	6	0	34	0
Internal Link Dist (ft)		362		428			378	
Turn Bay Length (ft)	220		125		115	115		110
Base Capacity (vph)	455	3847	317	3239	728	992	776	946
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.30	0.02	0.28	0.00	0.01	0.06	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1106	8	5	850	45	3	0	8	45	1	15
Future Volume (veh/h)	11	1106	8	5	850	45	3	0	8	45	1	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	11	1140	8	5	876	46	3	0	8	46	1	15
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	42	2554	18	11	1874	98	400	281	238	444	7	238
Arrive On Green	0.01	0.41	0.41	0.01	0.40	0.40	0.16	0.00	0.16	0.16	0.16	0.16
Sat Flow, veh/h	2910	6291	44	1594	4706	247	1320	1772	1502	1371	45	1502
Grp Volume(v), veh/h	11	828	320	5	600	322	3	0	8	47	0	15
Grp Sat Flow(s),veh/h/ln	1455	1524	1764	1594	1612	1728	1320	1772	1502	1417	0	1502
Q Serve(g_s), s	0.1	4.1	4.1	0.1	4.3	4.3	0.1	0.0	0.1	0.9	0.0	0.3
Cycle Q Clear(g_c), s	0.1	4.1	4.1	0.1	4.3	4.3	1.0	0.0	0.1	0.9	0.0	0.3
Prop In Lane	1.00		0.03	1.00		0.14	1.00		1.00	0.98		1.00
Lane Grp Cap(c), veh/h	42	1856	716	11	1284	688	400	281	238	451	0	238
V/C Ratio(X)	0.26	0.45	0.45	0.46	0.47	0.47	0.01	0.00	0.03	0.10	0.00	0.06
Avail Cap(c_a), veh/h	471	2975	1148	329	2242	1201	1008	1097	929	1101	0	929
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.4	6.8	6.8	15.6	7.0	7.0	11.9	0.0	11.2	11.5	0.0	11.3
Incr Delay (d2), s/veh	3.2	0.2	0.4	27.6	0.3	0.5	0.0	0.0	0.1	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.8	1.0	0.1	0.9	1.0	0.0	0.0	0.0	0.2	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.5	7.0	7.2	43.2	7.3	7.5	12.0	0.0	11.3	11.6	0.0	11.4
LnGrp LOS	B	A	A	D	A	A	B	A	B	B	A	B
Approach Vol, veh/h		1159			927			11			62	
Approach Delay, s/veh		7.1			7.5			11.5			11.6	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	4.7	17.3		9.5	5.0	17.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		19.5	6.5	20.5		19.5	5.1	21.9				
Max Q Clear Time (g_c+I1), s		3.0	2.1	6.1		2.9	2.1	6.3				
Green Ext Time (p_c), s		0.0	0.0	6.6		0.2	0.0	5.5				

Intersection Summary	
HCM 6th Ctrl Delay	7.5
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.991					0.865
Flt Protected						
Satd. Flow (prot)	4774	0	0	4818	0	1526
Flt Permitted						
Satd. Flow (perm)	4774	0	0	4818	0	1526
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	1087	72	0	920	0	15
Future Volume (vph)	1087	72	0	920	0	15
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1144	76	0	968	0	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1220	0	0	968	0	16

Intersection Summary

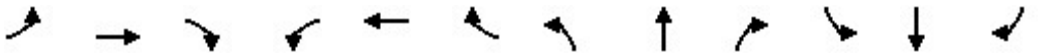
Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1087	72	0	920	0	15
Future Vol, veh/h	1087	72	0	920	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1144	76	0	968	0	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	610
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	375
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	375
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

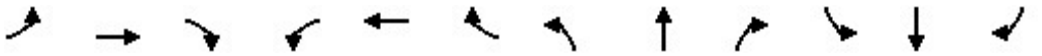
Approach	EB	WB	NB
HCM Control Delay, s	0	0	15
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	375	-	-	-
HCM Lane V/C Ratio	0.042	-	-	-
HCM Control Delay (s)	15	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.977	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5931	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5931	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			259			281			95		38	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



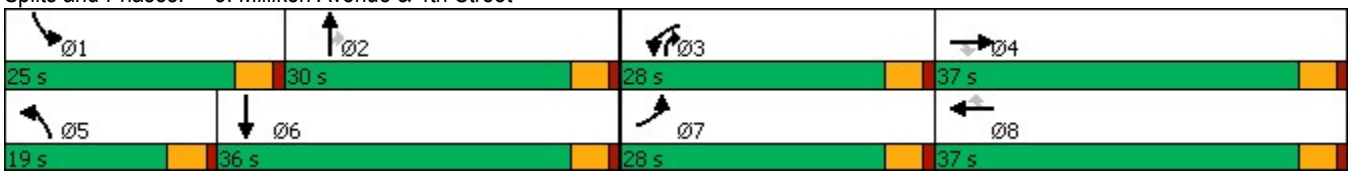
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	263	882	272	507	636	267	199	820	350	375	793	146
Future Volume (vph)	263	882	272	507	636	267	199	820	350	375	793	146
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	277	928	286	534	669	281	209	863	368	395	835	154
Shared Lane Traffic (%)												
Lane Group Flow (vph)	277	928	286	534	669	281	209	863	368	395	989	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	263	882	272	507	636	267	199	820	350	375	793
Future Volume (vph)	263	882	272	507	636	267	199	820	350	375	793
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	28.0	37.0	37.0	28.0	37.0	37.0	19.0	30.0	28.0	25.0	36.0
Total Split (%)	23.3%	30.8%	30.8%	23.3%	30.8%	30.8%	15.8%	25.0%	23.3%	20.8%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	16.2	29.5	29.5	23.0	36.3	36.3	12.6	22.9	50.4	18.8	29.2
Actuated g/C Ratio	0.14	0.26	0.26	0.20	0.32	0.32	0.11	0.20	0.45	0.17	0.26
v/c Ratio	0.67	0.73	0.49	0.91	0.43	0.42	0.65	0.70	0.51	0.82	0.63
Control Delay	54.6	42.3	9.1	65.2	32.1	5.8	58.8	45.4	19.4	60.6	37.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.6	42.3	9.1	65.2	32.1	5.8	58.8	45.4	19.4	60.6	37.9
LOS	D	D	A	E	C	A	E	D	B	E	D
Approach Delay		38.2			39.0			40.7			44.4
Approach LOS		D			D			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 112.4	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 40.5	Intersection LOS: D
Intersection Capacity Utilization 75.4%	ICU Level of Service D
Analysis Period (min) 15	

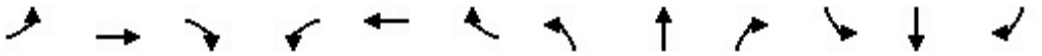
Splits and Phases: 5: Milliken Avenue & 4th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	277	928	286	534	669	281	209	863	368	395	989
v/c Ratio	0.67	0.73	0.49	0.91	0.43	0.42	0.65	0.70	0.51	0.82	0.63
Control Delay	54.6	42.3	9.1	65.2	32.1	5.8	58.8	45.4	19.4	60.6	37.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.6	42.3	9.1	65.2	32.1	5.8	58.8	45.4	19.4	60.6	37.9
Queue Length 50th (ft)	105	235	15	209	145	0	79	179	147	151	187
Queue Length 95th (ft)	146	289	89	#319	197	65	121	217	238	#224	227
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	610	1406	621	610	1565	676	376	1390	735	532	1705
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.66	0.46	0.88	0.43	0.42	0.56	0.62	0.50	0.74	0.58

Intersection Summary

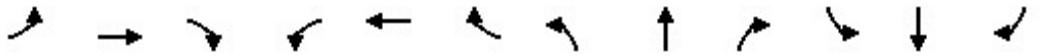
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	263	882	272	507	636	267	199	820	350	375	793	146
Future Volume (veh/h)	263	882	272	507	636	267	199	820	350	375	793	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	277	928	286	534	669	281	209	863	368	395	835	154
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	344	1205	374	589	1613	501	266	1371	642	456	1517	274
Arrive On Green	0.12	0.25	0.25	0.20	0.33	0.33	0.09	0.22	0.22	0.16	0.29	0.29
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	2910	6095	1502	2910	5229	945
Grp Volume(v), veh/h	277	928	286	534	669	281	209	863	368	395	728	261
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1455	1524	1502	1455	1524	1602
Q Serve(g_s), s	10.0	19.2	19.0	19.3	11.5	16.5	7.6	13.8	20.0	14.3	14.5	14.9
Cycle Q Clear(g_c), s	10.0	19.2	19.0	19.3	11.5	16.5	7.6	13.8	20.0	14.3	14.5	14.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.59
Lane Grp Cap(c), veh/h	344	1205	374	589	1613	501	266	1371	642	456	1326	465
V/C Ratio(X)	0.81	0.77	0.76	0.91	0.41	0.56	0.79	0.63	0.57	0.87	0.55	0.56
Avail Cap(c_a), veh/h	634	1458	453	634	1613	501	391	1442	659	553	1336	468
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.3	37.6	37.5	42.0	27.8	29.5	47.9	37.7	23.4	44.4	32.3	32.4
Incr Delay (d2), s/veh	4.5	2.1	6.2	16.1	0.2	1.4	6.3	0.8	1.2	11.8	0.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	7.7	7.6	8.2	4.4	6.1	3.0	5.2	7.1	5.9	5.4	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.8	39.7	43.8	58.1	28.0	30.9	54.2	38.5	24.6	56.2	32.8	34.0
LnGrp LOS	D	D	D	E	C	C	D	D	C	E	C	C
Approach Vol, veh/h		1491			1484			1440			1384	
Approach Delay, s/veh		42.6			39.3			37.2			39.7	
Approach LOS		D			D			D			D	

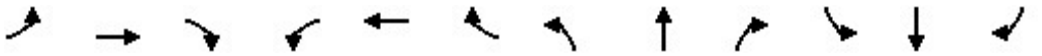
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.4	28.7	26.3	31.3	14.3	35.8	17.2	40.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	20.5	25.5	23.5	32.5	14.5	31.5	23.5	32.5
Max Q Clear Time (g_c+I1), s	16.3	22.0	21.3	21.2	9.6	16.9	12.0	18.5
Green Ext Time (p_c), s	0.6	2.2	0.5	5.6	0.3	5.9	0.7	4.8

Intersection Summary	
HCM 6th Ctrl Delay	39.7
HCM 6th LOS	D



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.947	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	3042	1365
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	3042	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			156			277			375		79	403
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



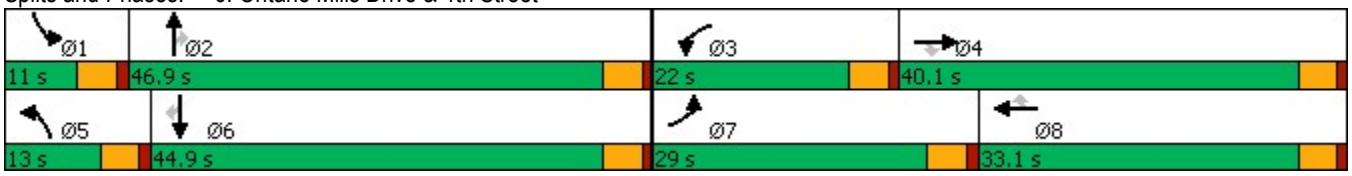
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	702	1026	150	394	846	404	175	306	469	65	607	745
Future Volume (vph)	702	1026	150	394	846	404	175	306	469	65	607	745
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	731	1069	156	410	881	421	182	319	489	68	632	776
Shared Lane Traffic (%)												44%
Lane Group Flow (vph)	731	1069	156	410	881	421	182	319	489	68	973	435

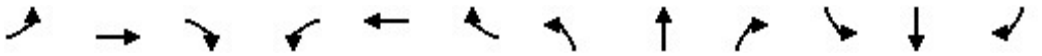
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	702	1026	150	394	846	404	175	306	469	65	607	745
Future Volume (vph)	702	1026	150	394	846	404	175	306	469	65	607	745
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	29.0	40.1	40.1	22.0	33.1	33.1	13.0	46.9	46.9	11.0	44.9	44.9
Total Split (%)	24.2%	33.4%	33.4%	18.3%	27.6%	27.6%	10.8%	39.1%	39.1%	9.2%	37.4%	37.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	24.5	34.7	34.7	17.5	27.7	27.7	8.5	41.4	41.4	6.5	39.4	39.4
Actuated g/C Ratio	0.21	0.29	0.29	0.15	0.23	0.23	0.07	0.35	0.35	0.06	0.33	0.33
v/c Ratio	1.22	0.76	0.28	0.96	0.78	0.75	1.60	0.27	0.64	0.78	0.91	0.60
Control Delay	153.1	42.0	6.3	84.6	48.1	23.3	342.4	28.4	11.7	106.7	48.3	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	153.1	42.0	6.3	84.6	48.1	23.3	342.4	28.4	11.7	106.7	48.3	8.0
LOS	F	D	A	F	D	C	F	C	B	F	D	A
Approach Delay		80.7			50.7			77.9			39.1	
Approach LOS		F			D			E			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 118.1	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.60	
Intersection Signal Delay: 61.9	Intersection LOS: E
Intersection Capacity Utilization 93.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 6: Ontario Mills Drive & 4th Street



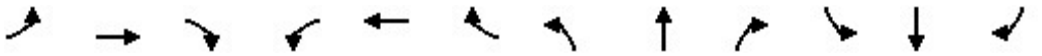


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	731	1069	156	410	881	421	182	319	489	68	973	435
v/c Ratio	1.22	0.76	0.28	0.96	0.78	0.75	1.60	0.27	0.64	0.78	0.91	0.60
Control Delay	153.1	42.0	6.3	84.6	48.1	23.3	342.4	28.4	11.7	106.7	48.3	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	153.1	42.0	6.3	84.6	48.1	23.3	342.4	28.4	11.7	106.7	48.3	8.0
Queue Length 50th (ft)	~362	273	0	164	234	103	~203	92	61	53	366	18
Queue Length 95th (ft)	#484	328	50	#267	285	232	#351	130	180	#137	#500	119
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	600	1454	561	428	1168	573	114	1205	779	87	1093	732
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.22	0.74	0.28	0.96	0.75	0.73	1.60	0.26	0.63	0.78	0.89	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



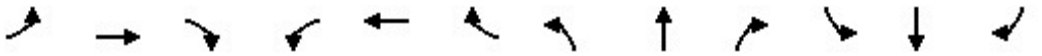
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	702	1026	150	394	846	404	175	306	469	65	607	745
Future Volume (veh/h)	702	1026	150	394	846	404	175	306	469	65	607	745
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	731	1069	156	410	881	421	182	319	489	68	623	782
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	594	1435	445	424	1153	358	113	1194	533	84	597	1011
Arrive On Green	0.20	0.30	0.30	0.15	0.24	0.24	0.07	0.35	0.35	0.05	0.34	0.34
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	1594	3367	1502	1594	1772	3003
Grp Volume(v), veh/h	731	1069	156	410	881	421	182	319	489	68	623	782
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1594	1683	1502	1594	1772	1502
Q Serve(g_s), s	24.5	23.9	9.8	16.8	20.4	28.6	8.5	8.1	37.4	5.1	40.4	28.0
Cycle Q Clear(g_c), s	24.5	23.9	9.8	16.8	20.4	28.6	8.5	8.1	37.4	5.1	40.4	28.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	594	1435	445	424	1153	358	113	1194	533	84	597	1011
V/C Ratio(X)	1.23	0.74	0.35	0.97	0.76	1.18	1.61	0.27	0.92	0.81	1.04	0.77
Avail Cap(c_a), veh/h	594	1435	445	424	1153	358	113	1194	533	86	597	1011
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.8	38.1	33.1	51.0	42.6	45.7	55.8	27.6	37.0	56.2	39.8	35.7
Incr Delay (d2), s/veh	117.9	2.2	0.5	34.8	3.1	104.8	312.5	0.1	21.0	40.9	48.9	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.5	9.7	3.6	8.2	8.4	21.0	13.2	3.3	16.6	3.0	25.4	10.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	165.6	40.3	33.6	85.8	45.7	150.5	368.2	27.7	58.1	97.1	88.7	39.5
LnGrp LOS	F	D	C	F	D	F	F	C	E	F	F	D
Approach Vol, veh/h		1956			1712			990			1473	
Approach Delay, s/veh		86.6			81.0			105.3			63.0	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.8	47.1	22.0	40.1	13.0	44.9	29.0	33.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	42.4	17.5	35.6	8.5	40.4	24.5	28.6
Max Q Clear Time (g_c+I1), s	7.1	39.4	18.8	25.9	10.5	42.4	26.5	30.6
Green Ext Time (p_c), s	0.0	1.2	0.0	5.3	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	82.4
HCM 6th LOS	F

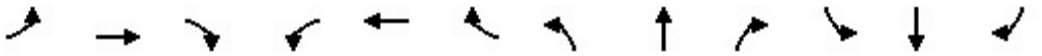
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.981			0.938				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.996	
Satd. Flow (prot)	2891	4818	1500	1583	4726	0	1583	3145	0	1504	1670	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.996	
Satd. Flow (perm)	2891	4818	1500	1583	4726	0	1583	3145	0	1504	1670	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95		18			48				444
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



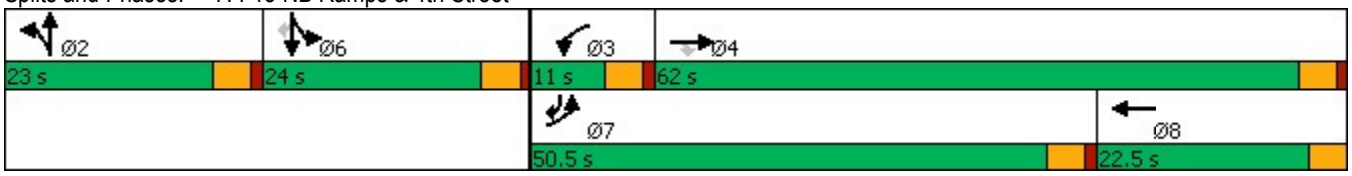
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	975	459	89	31	488	70	91	65	45	68	73	1090
Future Volume (vph)	975	459	89	31	488	70	91	65	45	68	73	1090
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1037	488	95	33	519	74	97	69	48	72	78	1160
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	1037	488	95	33	593	0	97	117	0	65	85	1160

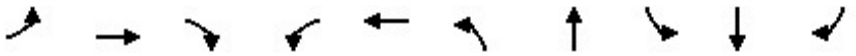
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	975	459	89	31	488	91	65	68	73	1090
Future Volume (vph)	975	459	89	31	488	91	65	68	73	1090
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	50.5	62.0	62.0	11.0	22.5	23.0	23.0	24.0	24.0	50.5
Total Split (%)	42.1%	51.7%	51.7%	9.2%	18.8%	19.2%	19.2%	20.0%	20.0%	42.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	43.5	58.2	58.2	6.3	17.2	11.6	11.6	10.6	10.6	58.7
Actuated g/C Ratio	0.43	0.58	0.58	0.06	0.17	0.12	0.12	0.11	0.11	0.59
v/c Ratio	0.83	0.17	0.10	0.33	0.72	0.53	0.29	0.41	0.48	0.67
Control Delay	33.2	11.7	3.3	58.8	44.8	54.9	28.3	52.6	54.3	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.2	11.7	3.3	58.8	44.8	54.9	28.3	52.6	54.3	10.7
LOS	C	B	A	E	D	D	C	D	D	B
Approach Delay		25.0			45.5		40.3		15.6	
Approach LOS		C			D		D		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.3	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 26.0	Intersection LOS: C
Intersection Capacity Utilization 68.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street

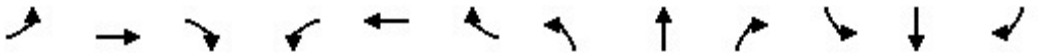




Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1037	488	95	33	593	97	117	65	85	1160
v/c Ratio	0.83	0.17	0.10	0.33	0.72	0.53	0.29	0.41	0.48	0.67
Control Delay	33.2	11.7	3.3	58.8	44.8	54.9	28.3	52.6	54.3	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.2	11.7	3.3	58.8	44.8	54.9	28.3	52.6	54.3	10.7
Queue Length 50th (ft)	301	56	0	22	132	62	22	43	56	168
Queue Length 95th (ft)	#492	93	27	57	193	120	51	92	114	278
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	1350	2891	938	104	926	297	630	297	330	1802
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.17	0.10	0.32	0.64	0.33	0.19	0.22	0.26	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	975	459	89	31	488	70	91	65	45	68	73	1090
Future Volume (veh/h)	975	459	89	31	488	70	91	65	45	68	73	1090
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	1037	488	95	33	519	74	97	69	48	72	78	1160
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1133	2488	772	48	664	93	136	168	107	307	341	1748
Arrive On Green	0.39	0.51	0.51	0.03	0.15	0.15	0.09	0.09	0.09	0.19	0.19	0.19
Sat Flow, veh/h	2910	4837	1502	1594	4287	601	1594	1973	1257	1594	1772	3003
Grp Volume(v), veh/h	1037	488	95	33	388	205	97	58	59	72	78	1160
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1594	1612	1664	1594	1683	1546	1594	1772	1502
Q Serve(g_s), s	34.2	5.5	3.3	2.1	11.7	12.0	6.0	3.3	3.7	3.9	3.8	19.5
Cycle Q Clear(g_c), s	34.2	5.5	3.3	2.1	11.7	12.0	6.0	3.3	3.7	3.9	3.8	19.5
Prop In Lane	1.00		1.00	1.00		0.36	1.00		0.81	1.00		1.00
Lane Grp Cap(c), veh/h	1133	2488	772	48	499	258	136	143	132	307	341	1748
V/C Ratio(X)	0.92	0.20	0.12	0.69	0.78	0.79	0.71	0.40	0.45	0.23	0.23	0.66
Avail Cap(c_a), veh/h	1323	2748	853	102	605	312	291	308	283	307	341	1748
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.3	13.3	12.7	48.6	41.1	41.2	45.1	43.9	44.0	34.5	34.5	14.4
Incr Delay (d2), s/veh	9.1	0.0	0.1	16.5	5.2	11.1	6.8	1.8	2.4	0.4	0.3	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.9	2.0	1.1	1.0	5.0	5.7	2.6	1.4	1.5	1.5	1.6	8.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.4	13.3	12.8	65.1	46.3	52.3	51.9	45.7	46.4	34.9	34.8	15.4
LnGrp LOS	D	B	B	E	D	D	D	D	D	C	C	B
Approach Vol, veh/h		1620			626			214			1310	
Approach Delay, s/veh		29.4			49.3			48.7			17.6	
Approach LOS		C			D			D			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		13.1	7.5	56.6		24.0	43.9	20.2				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		18.5	6.5	57.5		19.5	46.0	* 19				
Max Q Clear Time (g_c+I1), s		8.0	4.1	7.5		21.5	36.2	14.0				
Green Ext Time (p_c), s		0.6	0.0	4.1		0.0	3.2	1.7				

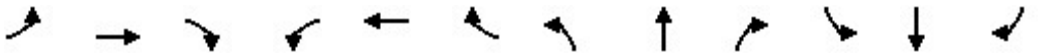
Intersection Summary		
HCM 6th Ctrl Delay		29.7
HCM 6th LOS		C

Notes

User approved volume balancing among the lanes for turning movement.

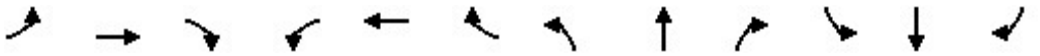
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

User approved changes to right turn type.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.903				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3028	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3028	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		48				236			236			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



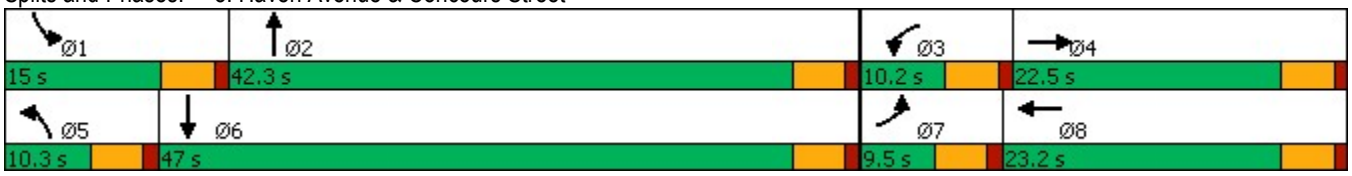
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	12	24	45	121	52	58	43	1523	192	41	1416	30
Future Volume (vph)	12	24	45	121	52	58	43	1523	192	41	1416	30
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	13	26	48	129	55	62	46	1620	204	44	1506	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	74	0	129	55	62	46	1620	204	44	1506	32

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	12	24	121	52	58	43	1523	192	41	1416	30
Future Volume (vph)	12	24	121	52	58	43	1523	192	41	1416	30
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	10.2	23.2		10.3	42.3		15.0	47.0	
Total Split (%)	10.6%	25.0%	11.3%	25.8%		11.4%	47.0%		16.7%	52.2%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.4	6.7	6.2	12.8	63.0	6.2	37.9	63.0	6.9	38.6	63.0
Actuated g/C Ratio	0.09	0.11	0.10	0.20	1.00	0.10	0.60	1.00	0.11	0.61	1.00
v/c Ratio	0.05	0.20	0.33	0.08	0.04	0.16	0.44	0.14	0.14	0.40	0.02
Control Delay	34.5	17.6	34.8	26.4	0.1	34.0	11.0	0.2	32.2	10.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.5	17.6	34.8	26.4	0.1	34.0	11.0	0.2	32.2	10.0	0.0
LOS	C	B	C	C	A	C	B	A	C	A	A
Approach Delay		20.2		24.1			10.4			10.4	
Approach LOS		C		C			B			B	

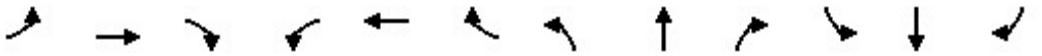
Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 63		
Natural Cycle: 65		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.44		
Intersection Signal Delay: 11.5	Intersection LOS: B	
Intersection Capacity Utilization 40.4%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	13	74	129	55	62	46	1620	204	44	1506	32
v/c Ratio	0.05	0.20	0.33	0.08	0.04	0.16	0.44	0.14	0.14	0.40	0.02
Control Delay	34.5	17.6	34.8	26.4	0.1	34.0	11.0	0.2	32.2	10.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.5	17.6	34.8	26.4	0.1	34.0	11.0	0.2	32.2	10.0	0.0
Queue Length 50th (ft)	2	5	19	10	0	9	135	0	9	120	0
Queue Length 95th (ft)	11	25	40	30	0	27	182	0	25	154	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	248	971	386	1079	1500	288	3981	1500	522	4284	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.08	0.33	0.05	0.04	0.16	0.41	0.14	0.08	0.35	0.02

Intersection Summary



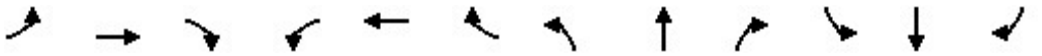
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	24	45	121	52	58	43	1523	192	41	1416	30
Future Volume (veh/h)	12	24	45	121	52	58	43	1523	192	41	1416	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	13	26	48	129	55	0	46	1620	0	44	1506	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	48	134	120	307	474		133	2903		129	2895	
Arrive On Green	0.02	0.08	0.08	0.08	0.14	0.00	0.05	0.48	0.00	0.04	0.47	0.00
Sat Flow, veh/h	2910	1683	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	13	26	48	129	55	0	46	1620	0	44	1506	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	0.2	0.8	1.7	1.7	0.8	0.0	0.9	10.6	0.0	0.8	9.6	0.0
Cycle Q Clear(g_c), s	0.2	0.8	1.7	1.7	0.8	0.0	0.9	10.6	0.0	0.8	9.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	48	134	120	307	474		133	2903		129	2895	
V/C Ratio(X)	0.27	0.19	0.40	0.42	0.12		0.35	0.56		0.34	0.52	
Avail Cap(c_a), veh/h	261	543	484	405	1127		302	4126		547	4639	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.1	24.0	24.4	24.6	21.0	0.0	25.8	10.4	0.0	25.9	10.2	0.0
Incr Delay (d2), s/veh	3.0	0.7	2.2	0.9	0.1	0.0	1.5	0.2	0.0	1.6	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.3	0.6	0.5	0.3	0.0	0.3	2.9	0.0	0.3	2.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.2	24.7	26.6	25.5	21.1	0.0	27.4	10.6	0.0	27.4	10.4	0.0
LnGrp LOS	C	C	C	C	C		C	B		C	B	
Approach Vol, veh/h		87			184	A		1666	A		1550	A
Approach Delay, s/veh		26.6			24.2			11.1			10.9	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	31.1	8.8	8.9	7.1	31.0	5.4	12.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	37.8	5.7	18.0	5.8	42.5	5.0	18.7
Max Q Clear Time (g_c+I1), s	2.8	12.6	3.7	3.7	2.9	11.6	2.2	2.8
Green Ext Time (p_c), s	0.0	14.0	0.1	0.2	0.0	14.2	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	12.0
HCM 6th LOS	B

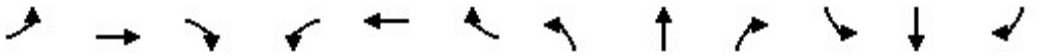
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.936									0.990	
Flt Protected	0.950	0.972					0.950					
Satd. Flow (prot)	1593	1525	0	0	1765	0	1676	4818	0	1765	4769	0
Flt Permitted	0.950	0.972					0.950					
Satd. Flow (perm)	1593	1525	0	0	1765	0	1676	4818	0	1765	4769	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		143						1			13	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



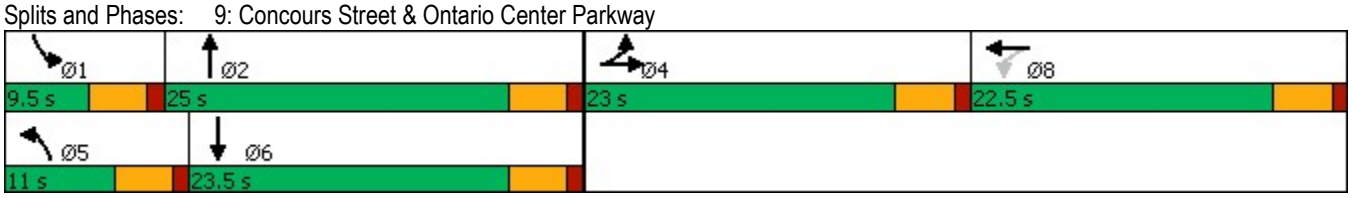
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	11	0	3	0	0	0	5	291	1	0	217	15
Future Volume (vph)	11	0	3	0	0	0	5	291	1	0	217	15
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	12	0	3	0	0	0	6	323	1	0	241	17
Shared Lane Traffic (%)	36%											
Lane Group Flow (vph)	8	7	0	0	0	0	6	324	0	0	258	0

Intersection Summary

Lane Group	EBL	EBT	NBL	NBT	SBT	Ø1	Ø8
Lane Configurations							
Traffic Volume (vph)	11	0	5	291	217		
Future Volume (vph)	11	0	5	291	217		
Turn Type	Split	NA	Prot	NA	NA		
Protected Phases	4	4	5	2	6	1	8
Permitted Phases							
Detector Phase	4	4	5	2	6		
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	9.5	22.5
Total Split (s)	23.0	23.0	11.0	25.0	23.5	9.5	22.5
Total Split (%)	28.8%	28.8%	13.8%	31.3%	29.4%	12%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		
Lead/Lag			Lead	Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	Min	Min	None	None
Act Effct Green (s)	6.0	6.0	5.9	27.1	25.6		
Actuated g/C Ratio	0.21	0.21	0.20	0.93	0.88		
v/c Ratio	0.02	0.02	0.02	0.07	0.06		
Control Delay	12.9	0.0	13.0	1.0	2.9		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	12.9	0.0	13.0	1.0	2.9		
LOS	B	A	B	A	A		
Approach Delay		6.9		1.2	2.9		
Approach LOS		A		A	A		

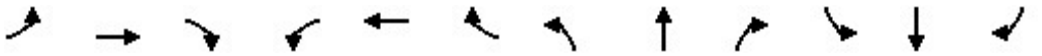
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 29.1	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.07	
Intersection Signal Delay: 2.1	Intersection LOS: A
Intersection Capacity Utilization 17.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	NBL	NBT	SBT
Lane Group Flow (vph)	8	7	6	324	258
v/c Ratio	0.02	0.02	0.02	0.07	0.06
Control Delay	12.9	0.0	13.0	1.0	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.9	0.0	13.0	1.0	2.9
Queue Length 50th (ft)	1	0	1	0	0
Queue Length 95th (ft)	10	0	9	14	24
Internal Link Dist (ft)		319		111	176
Turn Bay Length (ft)	170		115		
Base Capacity (vph)	1061	1064	392	4481	4230
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.01	0.02	0.07	0.06

Intersection Summary



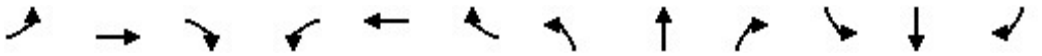
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	0	3	0	0	0	5	291	1	0	217	15
Future Volume (veh/h)	11	0	3	0	0	0	5	291	1	0	217	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	8	6	3	0	0	0	6	323	1	0	241	17
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	38	25	13	0	9	0	14	2519	8	9	1210	84
Arrive On Green	0.02	0.02	0.02	0.00	0.00	0.00	0.01	0.51	0.51	0.00	0.26	0.26
Sat Flow, veh/h	1688	1114	557	0	1772	0	1688	4979	15	1688	4618	321
Grp Volume(v), veh/h	8	0	9	0	0	0	6	209	115	0	167	91
Grp Sat Flow(s),veh/h/ln	1688	0	1672	0	1772	0	1688	1612	1769	1688	1612	1714
Q Serve(g_s), s	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.7	0.7	0.0	0.8	0.8
Cycle Q Clear(g_c), s	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.7	0.7	0.0	0.8	0.8
Prop In Lane	1.00		0.33	0.00		0.00	1.00		0.01	1.00		0.19
Lane Grp Cap(c), veh/h	38	0	38	0	9	0	14	1632	895	9	845	449
V/C Ratio(X)	0.21	0.00	0.24	0.00	0.00	0.00	0.43	0.13	0.13	0.00	0.20	0.20
Avail Cap(c_a), veh/h	1636	0	1620	0	1671	0	575	3464	1900	442	3210	1706
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	9.2	0.0	9.2	0.0	0.0	0.0	9.4	2.5	2.5	0.0	5.5	5.5
Incr Delay (d2), s/veh	2.7	0.0	3.2	0.0	0.0	0.0	19.9	0.0	0.1	0.0	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.9	0.0	12.4	0.0	0.0	0.0	29.4	2.5	2.6	0.0	5.6	5.7
LnGrp LOS	B	A	B	A	A	A	C	A	A	A	A	A
Approach Vol, veh/h		17			0			330			258	
Approach Delay, s/veh		12.1			0.0			3.0			5.6	
Approach LOS		B						A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	14.2		4.9	4.7	9.5		0.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	20.5		18.5	6.5	19.0		18.0				
Max Q Clear Time (g_c+I1), s	0.0	2.7		2.1	2.1	2.8		0.0				
Green Ext Time (p_c), s	0.0	1.8		0.0	0.0	1.3		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	4.4
HCM 6th LOS	A

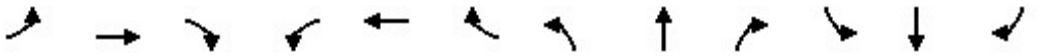
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			186			182			215			238
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



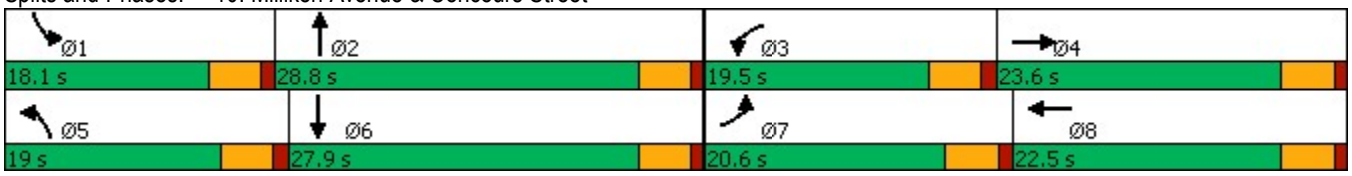
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	290	150	173	251	98	155	214	961	234	270	965	226
Future Volume (vph)	290	150	173	251	98	155	214	961	234	270	965	226
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	312	161	186	270	105	167	230	1033	252	290	1038	243
Shared Lane Traffic (%)												
Lane Group Flow (vph)	312	161	186	270	105	167	230	1033	252	290	1038	243

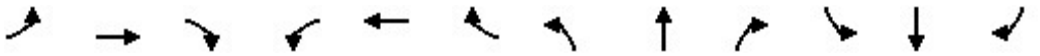
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	290	150	173	251	98	155	214	961	234	270	965	226
Future Volume (vph)	290	150	173	251	98	155	214	961	234	270	965	226
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	20.6	23.6		19.5	22.5		19.0	28.8		18.1	27.9	
Total Split (%)	22.9%	26.2%		21.7%	25.0%		21.1%	32.0%		20.1%	31.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	15.6	9.0	71.8	11.9	8.0	71.8	11.1	20.6	71.8	11.8	21.4	71.8
Actuated g/C Ratio	0.22	0.13	1.00	0.17	0.11	1.00	0.15	0.29	1.00	0.16	0.30	1.00
v/c Ratio	0.50	0.38	0.12	0.56	0.28	0.11	0.52	0.59	0.17	0.61	0.57	0.16
Control Delay	30.6	33.6	0.2	33.8	33.7	0.1	33.7	24.0	0.2	35.3	23.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	33.6	0.2	33.8	33.7	0.1	33.7	24.0	0.2	35.3	23.4	0.2
LOS	C	C	A	C	C	A	C	C	A	D	C	A
Approach Delay		22.7			23.4			21.5			22.0	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 71.8	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 22.1	Intersection LOS: C
Intersection Capacity Utilization 52.8%	ICU Level of Service A
Analysis Period (min) 15	

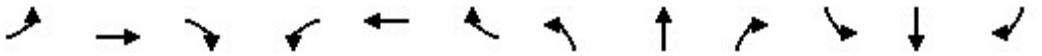
Splits and Phases: 10: Milliken Avenue & Concours Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	312	161	186	270	105	167	230	1033	252	290	1038	243
v/c Ratio	0.50	0.38	0.12	0.56	0.28	0.11	0.52	0.59	0.17	0.61	0.57	0.16
Control Delay	30.6	33.6	0.2	33.8	33.7	0.1	33.7	24.0	0.2	35.3	23.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	33.6	0.2	33.8	33.7	0.1	33.7	24.0	0.2	35.3	23.4	0.2
Queue Length 50th (ft)	69	36	0	59	24	0	51	116	0	63	113	0
Queue Length 95th (ft)	116	69	0	103	49	0	90	165	0	113	169	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	694	911	1500	617	858	1500	596	2099	1500	559	2050	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.18	0.12	0.44	0.12	0.11	0.39	0.49	0.17	0.52	0.51	0.16

Intersection Summary



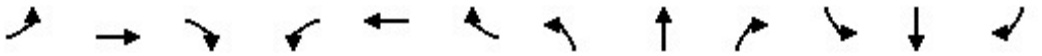
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	290	150	173	251	98	155	214	961	234	270	965	226
Future Volume (veh/h)	290	150	173	251	98	155	214	961	234	270	965	226
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	312	161	0	270	105	0	230	1033	0	290	1038	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	436	361		388	305		341	1791		406	1928	
Arrive On Green	0.15	0.11	0.00	0.13	0.09	0.00	0.12	0.29	0.00	0.14	0.32	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	312	161	0	270	105	0	230	1033	0	290	1038	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	5.6	2.5	0.0	4.9	1.6	0.0	4.2	8.0	0.0	5.3	7.7	0.0
Cycle Q Clear(g_c), s	5.6	2.5	0.0	4.9	1.6	0.0	4.2	8.0	0.0	5.3	7.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	436	361		388	305		341	1791		406	1928	
V/C Ratio(X)	0.71	0.45		0.70	0.34		0.67	0.58		0.71	0.54	
Avail Cap(c_a), veh/h	849	1165		791	1098		764	2683		717	2584	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.3	23.1	0.0	22.9	23.6	0.0	23.4	16.6	0.0	22.7	15.5	0.0
Incr Delay (d2), s/veh	2.2	0.9	0.0	2.3	0.7	0.0	2.3	0.3	0.0	2.3	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	1.0	0.0	1.7	0.6	0.0	1.4	2.5	0.0	1.8	2.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.5	24.0	0.0	25.1	24.2	0.0	25.7	16.9	0.0	25.0	15.8	0.0
LnGrp LOS	C	C		C	C		C	B		C	B	
Approach Vol, veh/h		473	A		375	A		1263	A		1328	A
Approach Delay, s/veh		24.3			24.9			18.5			17.8	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.2	20.7	11.9	10.4	11.0	22.0	12.8	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.6	24.3	15.0	19.1	14.5	23.4	16.1	18.0
Max Q Clear Time (g_c+I1), s	7.3	10.0	6.9	4.5	6.2	9.7	7.6	3.6
Green Ext Time (p_c), s	0.5	6.3	0.6	0.7	0.5	6.1	0.7	0.4

Intersection Summary	
HCM 6th Ctrl Delay	19.7
HCM 6th LOS	B

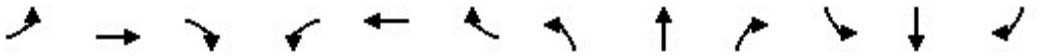
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			182			473			182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



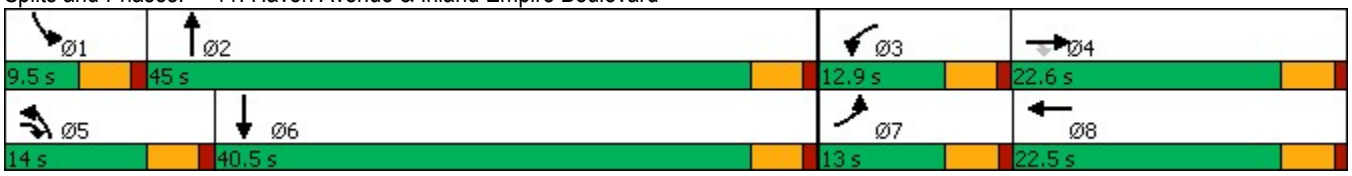
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	69	121	252	182	119	68	163	1625	548	53	1427	45
Future Volume (vph)	69	121	252	182	119	68	163	1625	548	53	1427	45
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	71	125	260	188	123	70	168	1675	565	55	1471	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	125	260	188	123	70	168	1675	565	55	1471	46

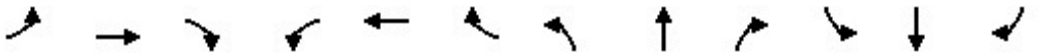
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	121	252	182	119	68	163	1625	548	53	1427	45
Future Volume (vph)	69	121	252	182	119	68	163	1625	548	53	1427	45
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	13.0	22.6	14.0	12.9	22.5		14.0	45.0		9.5	40.5	
Total Split (%)	14.4%	25.1%	15.6%	14.3%	25.0%		15.6%	50.0%		10.6%	45.0%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	7.2	8.3	18.7	8.1	9.0	71.6	8.9	39.2	71.6	5.2	30.7	71.6
Actuated g/C Ratio	0.10	0.12	0.26	0.11	0.13	1.00	0.12	0.55	1.00	0.07	0.43	1.00
v/c Ratio	0.24	0.32	0.58	0.42	0.29	0.05	0.47	0.50	0.38	0.26	0.57	0.03
Control Delay	35.4	34.6	22.5	35.8	33.7	0.1	37.1	12.5	0.7	39.2	16.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.4	34.6	22.5	35.8	33.7	0.1	37.1	12.5	0.7	39.2	16.9	0.0
LOS	D	C	C	D	C	A	D	B	A	D	B	A
Approach Delay		27.8			28.6			11.4			17.2	
Approach LOS		C			C			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 71.6	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 16.2	Intersection LOS: B
Intersection Capacity Utilization 53.9%	ICU Level of Service A
Analysis Period (min) 15	

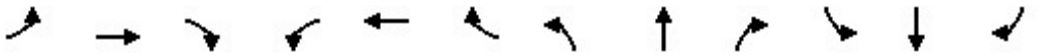
Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	71	125	260	188	123	70	168	1675	565	55	1471	46
v/c Ratio	0.24	0.32	0.58	0.42	0.29	0.05	0.47	0.50	0.38	0.26	0.57	0.03
Control Delay	35.4	34.6	22.5	35.8	33.7	0.1	37.1	12.5	0.7	39.2	16.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.4	34.6	22.5	35.8	33.7	0.1	37.1	12.5	0.7	39.2	16.9	0.0
Queue Length 50th (ft)	16	30	73	30	28	0	39	157	0	13	149	0
Queue Length 95th (ft)	37	56	152	54	56	0	73	202	0	32	193	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	357	881	466	481	876	1500	398	3572	1500	210	3175	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.14	0.56	0.39	0.14	0.05	0.42	0.47	0.38	0.26	0.46	0.03

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	121	252	182	119	68	163	1625	548	53	1427	45
Future Volume (veh/h)	69	121	252	182	119	68	163	1625	548	53	1427	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	71	125	260	188	123	0	168	1675	0	55	1471	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	154	643	412	296	717		242	2655		135	2431	
Arrive On Green	0.05	0.19	0.19	0.07	0.21	0.00	0.08	0.44	0.00	0.05	0.40	0.00
Sat Flow, veh/h	2910	3367	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	71	125	260	188	123	0	168	1675	0	55	1471	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	1.7	2.2	10.8	3.3	2.1	0.0	4.0	15.3	0.0	1.3	13.7	0.0
Cycle Q Clear(g_c), s	1.7	2.2	10.8	3.3	2.1	0.0	4.0	15.3	0.0	1.3	13.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	154	643	412	296	717		242	2655		135	2431	
V/C Ratio(X)	0.46	0.19	0.63	0.63	0.17		0.69	0.63		0.41	0.61	
Avail Cap(c_a), veh/h	346	853	506	466	849		387	3457		204	3073	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.8	24.3	22.7	32.1	23.0	0.0	31.8	15.7	0.0	33.1	17.0	0.0
Incr Delay (d2), s/veh	2.1	0.1	1.8	2.2	0.1	0.0	3.5	0.2	0.0	2.0	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.9	3.8	1.1	0.8	0.0	1.5	4.9	0.0	0.5	4.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.0	24.4	24.5	34.3	23.1	0.0	35.4	15.9	0.0	35.0	17.3	0.0
LnGrp LOS	C	C	C	C	C		D	B		D	B	
Approach Vol, veh/h		456			311	A		1843	A		1526	A
Approach Delay, s/veh		26.1			29.9			17.7			17.9	
Approach LOS		C			C			B			B	

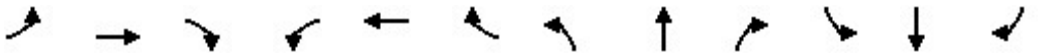
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	35.6	9.8	18.1	10.4	33.0	8.3	19.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	40.5	8.4	18.1	9.5	36.0	8.5	18.0
Max Q Clear Time (g_c+I1), s	3.3	17.3	5.3	12.8	6.0	15.7	3.7	4.1
Green Ext Time (p_c), s	0.0	13.8	0.2	0.8	0.2	11.1	0.1	0.5

Intersection Summary	
HCM 6th Ctrl Delay	19.6
HCM 6th LOS	B

Notes

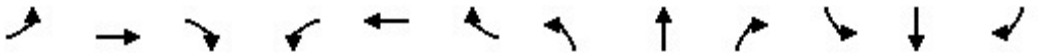
User approved changes to right turn type.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			270			193			596			193
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



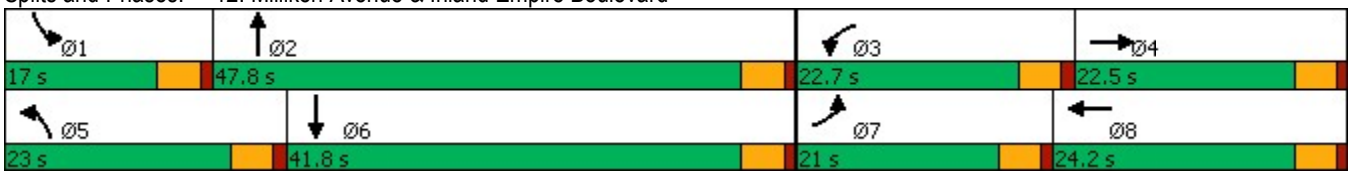
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	172	286	262	346	134	131	335	1069	763	137	1279	108
Future Volume (vph)	172	286	262	346	134	131	335	1069	763	137	1279	108
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	177	295	270	357	138	135	345	1102	787	141	1319	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	177	295	270	357	138	135	345	1102	787	141	1319	111

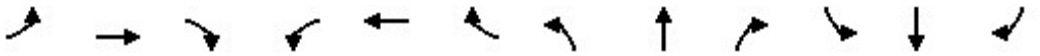
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	286	262	346	134	131	335	1069	763	137	1279	108
Future Volume (vph)	172	286	262	346	134	131	335	1069	763	137	1279	108
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	21.0	22.5		22.7	24.2		23.0	47.8		17.0	41.8	
Total Split (%)	19.1%	20.5%		20.6%	22.0%		20.9%	43.5%		15.5%	38.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	11.5	13.9	96.2	16.1	18.5	96.2	15.9	37.7	96.2	10.0	31.9	96.2
Actuated g/C Ratio	0.12	0.14	1.00	0.17	0.19	1.00	0.17	0.39	1.00	0.10	0.33	1.00
v/c Ratio	0.51	0.61	0.18	0.74	0.21	0.09	0.72	0.46	0.52	0.47	0.66	0.07
Control Delay	47.5	46.1	0.3	49.9	36.0	0.1	49.2	22.8	1.3	48.7	29.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.5	46.1	0.3	49.9	36.0	0.1	49.2	22.8	1.3	48.7	29.8	0.1
LOS	D	D	A	D	D	A	D	C	A	D	C	A
Approach Delay		29.8			36.2			19.3			29.4	
Approach LOS		C			D			B			C	

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 96.2	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 25.9	Intersection LOS: C
Intersection Capacity Utilization 66.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	177	295	270	357	138	135	345	1102	787	141	1319	111
v/c Ratio	0.51	0.61	0.18	0.74	0.21	0.09	0.72	0.46	0.52	0.47	0.66	0.07
Control Delay	47.5	46.1	0.3	49.9	36.0	0.1	49.2	22.8	1.3	48.7	29.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.5	46.1	0.3	49.9	36.0	0.1	49.2	22.8	1.3	48.7	29.8	0.1
Queue Length 50th (ft)	57	96	0	113	40	0	110	148	0	45	210	0
Queue Length 95th (ft)	94	147	0	#179	73	0	171	197	0	80	267	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	508	643	1500	561	725	1500	570	2810	1500	385	2415	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.46	0.18	0.64	0.19	0.09	0.61	0.39	0.52	0.37	0.55	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	172	286	262	346	134	131	335	1069	763	137	1279	108
Future Volume (veh/h)	172	286	262	346	134	131	335	1069	763	137	1279	108
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	177	295	0	357	138	0	345	1102	0	141	1319	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	255	423		448	645		436	2537		210	2063	
Arrive On Green	0.09	0.13	0.00	0.15	0.19	0.00	0.15	0.42	0.00	0.07	0.34	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	177	295	0	357	138	0	345	1102	0	141	1319	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	4.6	6.5	0.0	9.2	2.7	0.0	8.9	10.0	0.0	3.7	14.2	0.0
Cycle Q Clear(g_c), s	4.6	6.5	0.0	9.2	2.7	0.0	8.9	10.0	0.0	3.7	14.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	255	423		448	645		436	2537		210	2063	
V/C Ratio(X)	0.69	0.70		0.80	0.21		0.79	0.43		0.67	0.64	
Avail Cap(c_a), veh/h	620	782		684	856		695	3407		470	2935	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.3	32.5	0.0	31.6	26.4	0.0	31.8	16.1	0.0	35.0	21.6	0.0
Incr Delay (d2), s/veh	3.4	2.1	0.0	3.8	0.2	0.0	3.3	0.1	0.0	3.7	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	2.7	0.0	3.4	1.1	0.0	3.2	3.3	0.0	1.4	4.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.7	34.6	0.0	35.4	26.6	0.0	35.0	16.2	0.0	38.7	22.0	0.0
LnGrp LOS	D	C		D	C		D	B		D	C	
Approach Vol, veh/h		472	A		495	A		1447	A		1460	A
Approach Delay, s/veh		35.7			33.0			20.7			23.6	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.1	36.7	16.4	14.2	16.1	30.7	11.3	19.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	43.3	18.2	18.0	18.5	37.3	16.5	19.7
Max Q Clear Time (g_c+I1), s	5.7	12.0	11.2	8.5	10.9	16.2	6.6	4.7
Green Ext Time (p_c), s	0.2	9.5	0.8	1.2	0.8	10.1	0.4	0.6

Intersection Summary	
HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.925	0.850				
Flt Protected	0.976					
Satd. Flow (prot)	2919	1365	6071	0	0	6071
Flt Permitted	0.976					
Satd. Flow (perm)	2919	1365	6071	0	0	6071
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	8	8				
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

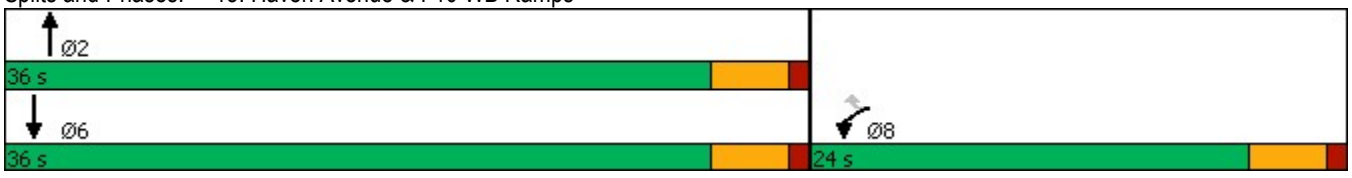
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	233	465	1834	0	0	1247
Future Volume (vph)	233	465	1834	0	0	1247
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.98	0.98	0.98	0.92	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	238	474	1871	0	0	1272
Shared Lane Traffic (%)		50%				
Lane Group Flow (vph)	475	237	1871	0	0	1272

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	233	465	1834	1247
Future Volume (vph)	233	465	1834	1247
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	36.0	36.0
Total Split (%)	40.0%	40.0%	60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	14.5	14.5	29.9	29.9
Actuated g/C Ratio	0.27	0.27	0.56	0.56
v/c Ratio	0.60	0.63	0.55	0.38
Control Delay	20.2	25.2	8.8	7.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.2	25.2	8.8	7.4
LOS	C	C	A	A
Approach Delay	21.9		8.8	7.4
Approach LOS	C		A	A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 53.6	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 10.8	Intersection LOS: B
Intersection Capacity Utilization 66.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps



Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	475	237	1871	1272
v/c Ratio	0.60	0.63	0.55	0.38
Control Delay	20.2	25.2	8.8	7.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.2	25.2	8.8	7.4
Queue Length 50th (ft)	69	72	99	59
Queue Length 95th (ft)	107	140	154	94
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	1088	511	3638	3638
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.44	0.46	0.51	0.35

Intersection Summary

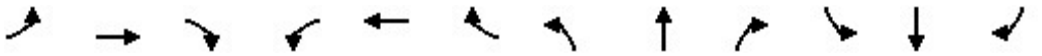
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	233	465	1834	0	0	1247
Future Volume (veh/h)	233	465	1834	0	0	1247
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1673	1772	1772	0	0	1772
Adj Flow Rate, veh/h	237	475	1871	0	0	1272
Peak Hour Factor	0.98	0.98	0.98	0.92	0.98	0.98
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	378	713	3420	0	0	3420
Arrive On Green	0.24	0.24	0.56	0.00	0.00	0.56
Sat Flow, veh/h	1594	3003	6592	0	0	6592
Grp Volume(v), veh/h	237	475	1871	0	0	1272
Grp Sat Flow(s),veh/h/ln	1594	1502	1524	0	0	1524
Q Serve(g_s), s	5.9	6.4	8.7	0.0	0.0	5.2
Cycle Q Clear(g_c), s	5.9	6.4	8.7	0.0	0.0	5.2
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	378	713	3420	0	0	3420
V/C Ratio(X)	0.63	0.67	0.55	0.00	0.00	0.37
Avail Cap(c_a), veh/h	696	1312	4302	0	0	4302
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	15.2	15.4	6.2	0.0	0.0	5.4
Incr Delay (d2), s/veh	1.7	1.1	0.1	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	2.0	1.7	0.0	0.0	1.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.0	16.5	6.3	0.0	0.0	5.5
LnGrp LOS	B	B	A	A	A	A
Approach Vol, veh/h	712		1871			1272
Approach Delay, s/veh	16.7		6.3			5.5
Approach LOS	B		A			A

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	29.5			29.5	15.1
Change Period (Y+Rc), s	4.5			4.5	4.5
Max Green Setting (Gmax), s	31.5			31.5	19.5
Max Q Clear Time (g_c+I1), s	10.7			7.2	8.4
Green Ext Time (p_c), s	14.4			10.4	2.2

Intersection Summary	
HCM 6th Ctrl Delay	8.0
HCM 6th LOS	A

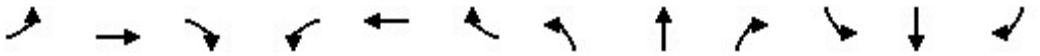
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			136			230			55
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



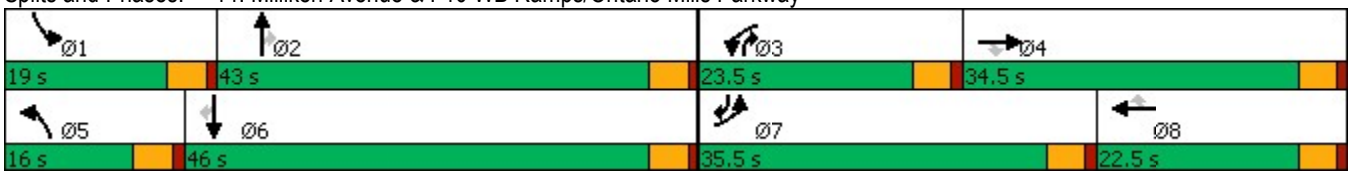
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	595	220	125	266	332	99	202	1301	404	293	964	767
Future Volume (vph)	595	220	125	266	332	99	202	1301	404	293	964	767
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	640	237	134	286	357	106	217	1399	434	315	1037	825
Shared Lane Traffic (%)												
Lane Group Flow (vph)	640	237	134	286	357	106	217	1399	434	315	1037	825

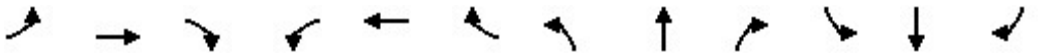
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	595	220	125	266	332	99	202	1301	404	293	964	767
Future Volume (vph)	595	220	125	266	332	99	202	1301	404	293	964	767
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	35.5	34.5	34.5	23.5	22.5	22.5	16.0	43.0	23.5	19.0	46.0	35.5
Total Split (%)	29.6%	28.8%	28.8%	19.6%	18.8%	18.8%	13.3%	35.8%	19.6%	15.8%	38.3%	29.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	29.3	29.3	29.3	16.2	16.2	16.2	11.2	35.8	56.5	14.3	39.0	72.8
Actuated g/C Ratio	0.26	0.26	0.26	0.14	0.14	0.14	0.10	0.31	0.50	0.13	0.34	0.64
v/c Ratio	0.86	0.52	0.29	0.70	0.75	0.32	0.76	0.73	0.50	0.87	0.50	0.84
Control Delay	53.8	42.2	14.5	56.7	58.2	6.2	69.5	37.7	10.5	73.5	31.0	25.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	42.2	14.5	56.7	58.2	6.2	69.5	37.7	10.5	73.5	31.0	25.0
LOS	D	D	B	E	E	A	E	D	B	E	C	C
Approach Delay		45.8			50.3			35.3			34.9	
Approach LOS		D			D			D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 113.8	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 38.8	Intersection LOS: D
Intersection Capacity Utilization 77.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway

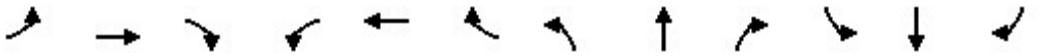




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	640	237	134	286	357	106	217	1399	434	315	1037	825
v/c Ratio	0.86	0.52	0.29	0.70	0.75	0.32	0.76	0.73	0.50	0.87	0.50	0.84
Control Delay	53.8	42.2	14.5	56.7	58.2	6.2	69.5	37.7	10.5	73.5	31.0	25.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	42.2	14.5	56.7	58.2	6.2	69.5	37.7	10.5	73.5	31.0	25.0
Queue Length 50th (ft)	243	158	23	108	140	0	86	276	92	125	182	434
Queue Length 95th (ft)	#338	244	76	155	193	30	#146	320	175	#210	217	671
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	793	476	474	486	534	353	294	2069	893	371	2231	1003
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.50	0.28	0.59	0.67	0.30	0.74	0.68	0.49	0.85	0.46	0.82

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	595	220	125	266	332	99	202	1301	404	293	964	767
Future Volume (veh/h)	595	220	125	266	332	99	202	1301	404	293	964	767
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	640	237	134	286	357	106	217	1399	434	315	1037	825
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	706	452	383	346	441	197	267	2071	688	364	2272	924
Arrive On Green	0.24	0.25	0.25	0.12	0.13	0.13	0.09	0.34	0.34	0.12	0.37	0.37
Sat Flow, veh/h	2910	1772	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	640	237	134	286	357	106	217	1399	434	315	1037	825
Grp Sat Flow(s),veh/h/ln	1455	1772	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	23.8	12.8	8.1	10.7	11.5	7.3	8.1	21.9	24.5	11.8	14.3	41.5
Cycle Q Clear(g_c), s	23.8	12.8	8.1	10.7	11.5	7.3	8.1	21.9	24.5	11.8	14.3	41.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	706	452	383	346	441	197	267	2071	688	364	2272	924
V/C Ratio(X)	0.91	0.52	0.35	0.83	0.81	0.54	0.81	0.68	0.63	0.87	0.46	0.89
Avail Cap(c_a), veh/h	810	477	405	497	544	243	301	2108	698	379	2272	924
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.9	35.7	33.9	47.9	47.0	45.2	49.6	31.5	23.0	47.8	26.4	18.3
Incr Delay (d2), s/veh	12.7	0.9	0.5	7.6	7.4	2.3	14.0	0.9	1.8	18.1	0.1	11.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	5.6	3.0	4.2	5.2	2.9	3.5	8.1	8.8	5.2	5.2	19.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.6	36.6	34.5	55.6	54.4	47.5	63.6	32.3	24.8	65.9	26.5	29.2
LnGrp LOS	D	D	C	E	D	D	E	C	C	E	C	C
Approach Vol, veh/h		1011			749			2050			2177	
Approach Delay, s/veh		47.1			53.9			34.0			33.3	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.4	42.3	17.7	32.9	14.7	46.0	31.5	19.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	38.5	19.0	30.0	11.5	41.5	31.0	18.0
Max Q Clear Time (g_c+I1), s	13.8	26.5	12.7	14.8	10.1	43.5	25.8	13.5
Green Ext Time (p_c), s	0.1	8.4	0.5	1.6	0.1	0.0	1.3	1.1

Intersection Summary	
HCM 6th Ctrl Delay	38.4
HCM 6th LOS	D

Notes

User approved changes to right turn type.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.992	0.850				
Flt Protected	0.955					
Satd. Flow (prot)	3063	1365	0	6071	6071	0
Flt Permitted	0.955					
Satd. Flow (perm)	3063	1365	0	6071	6071	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	11	11				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

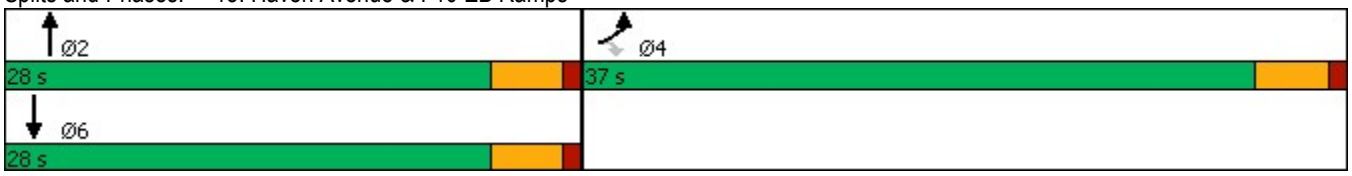
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	961	516	0	1427	1170	0
Future Volume (vph)	961	516	0	1427	1170	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	991	532	0	1471	1206	0
Shared Lane Traffic (%)		11%				
Lane Group Flow (vph)	1050	473	0	1471	1206	0

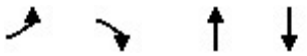
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	961	516	1427	1170
Future Volume (vph)	961	516	1427	1170
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	37.0	37.0	28.0	28.0
Total Split (%)	56.9%	56.9%	43.1%	43.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	26.5	26.5	22.6	22.6
Actuated g/C Ratio	0.46	0.46	0.39	0.39
v/c Ratio	0.75	0.76	0.63	0.51
Control Delay	16.9	21.8	16.6	15.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.9	21.8	16.6	15.3
LOS	B	C	B	B
Approach Delay	18.4		16.6	15.3
Approach LOS	B		B	B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 58.2	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 16.9	Intersection LOS: B
Intersection Capacity Utilization 66.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1050	473	1471	1206
v/c Ratio	0.75	0.76	0.63	0.51
Control Delay	16.9	21.8	16.6	15.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.9	21.8	16.6	15.3
Queue Length 50th (ft)	149	142	120	93
Queue Length 95th (ft)	212	257	175	138
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	1749	782	2499	2499
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	0.60	0.59	0.48

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	961	516	0	1427	1170	0
Future Volume (veh/h)	961	516	0	1427	1170	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1772	0	1772	1772	0
Adj Flow Rate, veh/h	1014	508	0	1471	1206	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	1406	662	0	2332	2332	0
Arrive On Green	0.44	0.44	0.00	0.38	0.38	0.00
Sat Flow, veh/h	3188	1502	0	6592	6592	0
Grp Volume(v), veh/h	1014	508	0	1471	1206	0
Grp Sat Flow(s),veh/h/ln	1594	1502	0	1524	1524	0
Q Serve(g_s), s	13.3	14.6	0.0	10.0	7.8	0.0
Cycle Q Clear(g_c), s	13.3	14.6	0.0	10.0	7.8	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	1406	662	0	2332	2332	0
V/C Ratio(X)	0.72	0.77	0.00	0.63	0.52	0.00
Avail Cap(c_a), veh/h	2031	957	0	2808	2808	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	11.7	12.0	0.0	12.8	12.1	0.0
Incr Delay (d2), s/veh	0.7	2.3	0.0	0.3	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	4.3	0.0	2.9	2.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.4	14.4	0.0	13.2	12.3	0.0
LnGrp LOS	B	B	A	B	B	A
Approach Vol, veh/h	1522			1471	1206	
Approach Delay, s/veh	13.1			13.2	12.3	
Approach LOS	B			B	B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		24.0		27.0		24.0
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		23.5		32.5		23.5
Max Q Clear Time (g_c+I1), s		12.0		16.6		9.8
Green Ext Time (p_c), s		7.5		5.9		7.1

Intersection Summary	
HCM 6th Ctrl Delay	12.9
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1600	1800	1600	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2891	1500	2891	6071	6071	1500
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2891	1500	2891	6071	6071	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		14				138
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	853	213	152	1102	804	576
Future Volume (vph)	853	213	152	1102	804	576
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	879	220	157	1136	829	594
Shared Lane Traffic (%)						
Lane Group Flow (vph)	879	220	157	1136	829	594

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	853	213	152	1102	804	576
Future Volume (vph)	853	213	152	1102	804	576
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	39.0	12.0	12.0	36.0	24.0	39.0
Total Split (%)	52.0%	16.0%	16.0%	48.0%	32.0%	52.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	26.4	38.4	7.4	27.9	15.9	47.0
Actuated g/C Ratio	0.42	0.60	0.12	0.44	0.25	0.74
v/c Ratio	0.73	0.24	0.47	0.43	0.55	0.52
Control Delay	19.9	6.5	34.4	13.6	22.9	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.9	6.5	34.4	13.6	22.9	4.2
LOS	B	A	C	B	C	A
Approach Delay	17.2			16.1	15.1	
Approach LOS	B			B	B	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 63.6	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 16.0	Intersection LOS: B
Intersection Capacity Utilization 57.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	879	220	157	1136	829	594
v/c Ratio	0.73	0.24	0.47	0.43	0.55	0.52
Control Delay	19.9	6.5	34.4	13.6	22.9	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.9	6.5	34.4	13.6	22.9	4.2
Queue Length 50th (ft)	142	33	30	85	82	48
Queue Length 95th (ft)	217	68	65	133	125	88
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	1612	920	350	3091	1913	1324
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.24	0.45	0.37	0.43	0.45

Intersection Summary

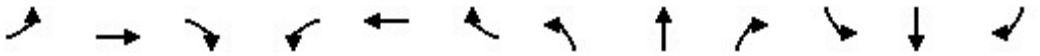
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	853	213	152	1102	804	576
Future Volume (veh/h)	853	213	152	1102	804	576
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1772	1575	1772	1772	1772
Adj Flow Rate, veh/h	879	220	157	1136	829	594
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1097	689	238	2840	1863	1025
Arrive On Green	0.38	0.38	0.08	0.47	0.31	0.31
Sat Flow, veh/h	2910	1502	2910	6343	6343	1502
Grp Volume(v), veh/h	879	220	157	1136	829	594
Grp Sat Flow(s),veh/h/ln	1455	1502	1455	1524	1524	1502
Q Serve(g_s), s	15.4	5.3	3.0	7.0	6.3	11.9
Cycle Q Clear(g_c), s	15.4	5.3	3.0	7.0	6.3	11.9
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1097	689	238	2840	1863	1025
V/C Ratio(X)	0.80	0.32	0.66	0.40	0.45	0.58
Avail Cap(c_a), veh/h	1753	1027	381	3352	2075	1077
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.9	9.8	25.5	10.0	16.0	4.8
Incr Delay (d2), s/veh	1.4	0.3	3.1	0.1	0.2	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	5.4	1.1	2.0	2.0	7.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.4	10.1	28.6	10.1	16.2	5.5
LnGrp LOS	B	B	C	B	B	A
Approach Vol, veh/h	1099			1293	1423	
Approach Delay, s/veh	15.9			12.4	11.7	
Approach LOS	B			B	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		31.2		26.1	9.2	22.0
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		31.5		34.5	7.5	19.5
Max Q Clear Time (g_c+I1), s		9.0		17.4	5.0	13.9
Green Ext Time (p_c), s		8.7		4.1	0.1	3.6

Intersection Summary		
HCM 6th Ctrl Delay		13.1
HCM 6th LOS		B

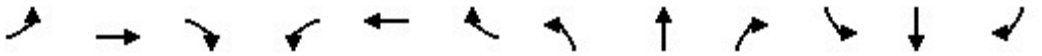
Appendix C

Intersection LOS Analysis Sheets
Existing Plus Project Conditions



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.962				0.850			0.850		0.994	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4635	0	2891	3353	1500	2891	4818	1500	2891	6034	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4635	0	2891	3353	1500	2891	4818	1500	2891	6034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		66				149			238		9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



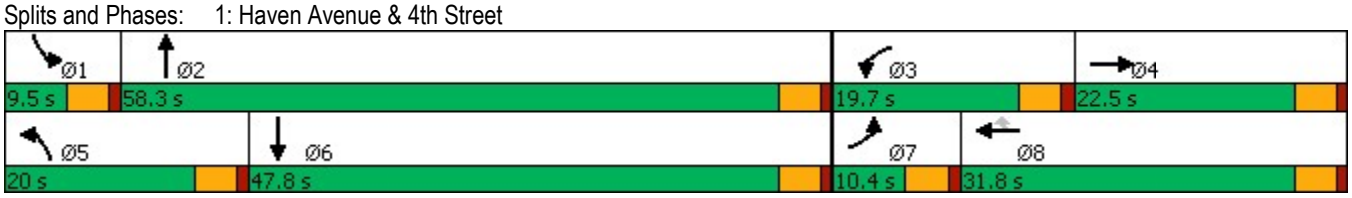
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	89	293	98	265	512	147	201	1479	469	95	1186	53
Future Volume (vph)	89	293	98	265	512	147	201	1479	469	95	1186	53
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	98	322	108	291	563	162	221	1625	515	104	1303	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	430	0	291	563	162	221	1625	515	104	1361	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	89	293	265	512	147	201	1479	469	95	1186
Future Volume (vph)	89	293	265	512	147	201	1479	469	95	1186
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	10.4	22.5	19.7	31.8	31.8	20.0	58.3		9.5	47.8
Total Split (%)	9.5%	20.5%	17.9%	28.9%	28.9%	18.2%	53.0%		8.6%	43.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	5.9	15.1	14.1	23.3	23.3	12.9	53.9	106.1	5.0	46.0
Actuated g/C Ratio	0.06	0.14	0.13	0.22	0.22	0.12	0.51	1.00	0.05	0.43
v/c Ratio	0.61	0.60	0.76	0.77	0.36	0.63	0.66	0.34	0.76	0.52
Control Delay	66.7	39.7	58.3	46.3	9.3	52.8	21.5	0.6	84.7	23.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.7	39.7	58.3	46.3	9.3	52.8	21.5	0.6	84.7	23.6
LOS	E	D	E	D	A	D	C	A	F	C
Approach Delay		44.7		43.8			19.9			27.9
Approach LOS		D		D			B			C

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 106.1	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 29.1	Intersection LOS: C
Intersection Capacity Utilization 68.4%	ICU Level of Service C
Analysis Period (min) 15	

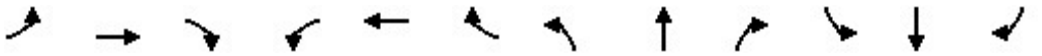
Splits and Phases: 1: Haven Avenue & 4th Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	98	430	291	563	162	221	1625	515	104	1361
v/c Ratio	0.61	0.60	0.76	0.77	0.36	0.63	0.66	0.34	0.76	0.52
Control Delay	66.7	39.7	58.3	46.3	9.3	52.8	21.5	0.6	84.7	23.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.7	39.7	58.3	46.3	9.3	52.8	21.5	0.6	84.7	23.6
Queue Length 50th (ft)	34	86	100	189	7	75	296	0	37	197
Queue Length 95th (ft)	#71	122	#154	251	60	115	368	0	#86	251
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	161	842	414	864	497	423	2447	1500	136	2619
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.51	0.70	0.65	0.33	0.52	0.66	0.34	0.76	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



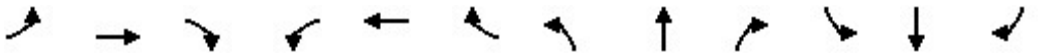
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	293	98	265	512	147	201	1479	469	95	1186	53
Future Volume (veh/h)	89	293	98	265	512	147	201	1479	469	95	1186	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	98	322	108	291	563	162	221	1625	0	104	1303	58
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	144	494	157	350	696	310	282	2521		141	2849	127
Arrive On Green	0.05	0.14	0.14	0.12	0.21	0.21	0.10	0.52	0.00	0.05	0.47	0.47
Sat Flow, veh/h	2910	3633	1155	2910	3367	1502	2910	4837	1502	2910	6027	268
Grp Volume(v), veh/h	98	284	146	291	563	162	221	1625	0	104	988	373
Grp Sat Flow(s),veh/h/ln	1455	1612	1564	1455	1683	1502	1455	1612	1502	1455	1524	1724
Q Serve(g_s), s	3.4	8.6	9.2	10.1	16.4	9.9	7.7	25.0	0.0	3.6	15.0	15.1
Cycle Q Clear(g_c), s	3.4	8.6	9.2	10.1	16.4	9.9	7.7	25.0	0.0	3.6	15.0	15.1
Prop In Lane	1.00		0.74	1.00		1.00	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	144	439	213	350	696	310	282	2521		141	2161	815
V/C Ratio(X)	0.68	0.65	0.69	0.83	0.81	0.52	0.78	0.64		0.74	0.46	0.46
Avail Cap(c_a), veh/h	166	562	273	428	890	397	437	2521		141	2161	815
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.3	42.3	42.5	44.4	39.0	36.4	45.6	17.8	0.0	48.5	18.3	18.3
Incr Delay (d2), s/veh	9.0	1.7	4.9	11.1	4.4	1.4	5.0	1.3	0.0	18.3	0.7	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	3.5	3.8	4.2	7.1	3.7	2.9	9.1	0.0	1.7	5.3	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.2	43.9	47.4	55.5	43.4	37.8	50.5	19.1	0.0	66.8	19.0	20.2
LnGrp LOS	E	D	D	E	D	D	D	B		E	B	C
Approach Vol, veh/h		528			1016			1846	A		1465	
Approach Delay, s/veh		47.4			46.0			22.9			22.7	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	58.3	16.9	18.5	14.5	53.3	9.6	25.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	53.8	15.2	18.0	15.5	43.3	5.9	27.3
Max Q Clear Time (g_c+I1), s	5.6	27.0	12.1	11.2	9.7	17.1	5.4	18.4
Green Ext Time (p_c), s	0.0	14.6	0.3	1.5	0.4	11.0	0.0	2.9

Intersection Summary	
HCM 6th Ctrl Delay	30.3
HCM 6th LOS	C

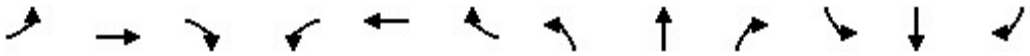
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.988				0.850			0.850		0.850	
Flt Protected	0.950			0.950			0.950					
Satd. Flow (prot)	1583	5998	0	1583	4818	1500	1583	1765	1500	1667	2850	0
Flt Permitted	0.950			0.950			0.950					
Satd. Flow (perm)	1583	5998	0	1583	4818	1500	1583	1765	1500	1667	2850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25				164			164		327	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	37	476	40	1	676	54	43	1	1	0	0	3
Future Volume (vph)	37	476	40	1	676	54	43	1	1	0	0	3
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	41	529	44	1	751	60	48	1	1	0	0	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	573	0	1	751	60	48	1	1	0	3	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBT	Ø1
Lane Configurations										
Traffic Volume (vph)	37	476	1	676	54	43	1	1	0	
Future Volume (vph)	37	476	1	676	54	43	1	1	0	
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	NA	
Protected Phases	7	4	3	8		5	2		6	1
Permitted Phases					8			2		
Detector Phase	7	4	3	8	8	5	2	2	6	
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	22.5	9.5
Total Split (s)	9.5	22.5	9.5	22.5	22.5	11.3	23.0	23.0	26.7	15.0
Total Split (%)	13.6%	32.1%	13.6%	32.1%	32.1%	16.1%	32.9%	32.9%	38.1%	21%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	Min	Min	None
Act Effct Green (s)	5.7	15.7	5.7	14.4	14.4	7.0	9.4	9.4	6.3	
Actuated g/C Ratio	0.16	0.43	0.16	0.39	0.39	0.19	0.26	0.26	0.17	
v/c Ratio	0.17	0.22	0.00	0.40	0.09	0.16	0.00	0.00	0.00	
Control Delay	21.7	7.6	21.0	10.4	0.2	19.7	12.0	0.0	0.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	21.7	7.6	21.0	10.4	0.2	19.7	12.0	0.0	0.0	
LOS	C	A	C	B	A	B	B	A	A	
Approach Delay		8.5		9.7			19.1			
Approach LOS		A		A			B			

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 36.7	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.40	
Intersection Signal Delay: 9.5	Intersection LOS: A
Intersection Capacity Utilization 38.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street

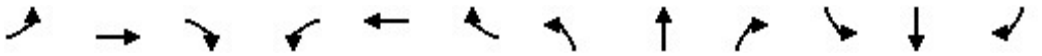
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	41	573	1	751	60	48	1	1	3
v/c Ratio	0.17	0.22	0.00	0.40	0.09	0.16	0.00	0.00	0.00
Control Delay	21.7	7.6	21.0	10.4	0.2	19.7	12.0	0.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	7.6	21.0	10.4	0.2	19.7	12.0	0.0	0.0
Queue Length 50th (ft)	6	10	0	19	0	6	0	0	0
Queue Length 95th (ft)	36	53	4	95	0	39	3	0	0
Internal Link Dist (ft)		2546		362			269		358
Turn Bay Length (ft)	130		130		145	165		165	
Base Capacity (vph)	245	3572	245	2696	911	334	1015	932	2067
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.16	0.00	0.28	0.07	0.14	0.00	0.00	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	476	40	1	676	54	43	1	1	0	0	3
Future Volume (veh/h)	37	476	40	1	676	54	43	1	1	0	0	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	41	529	44	1	751	60	48	1	1	0	0	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	74	1943	159	4	1407	437	84	540	457	4	223	199
Arrive On Green	0.05	0.34	0.34	0.00	0.29	0.29	0.05	0.30	0.30	0.00	0.00	0.13
Sat Flow, veh/h	1594	5786	472	1594	4837	1502	1594	1772	1502	1594	1683	1502
Grp Volume(v), veh/h	41	416	157	1	751	60	48	1	1	0	0	3
Grp Sat Flow(s),veh/h/ln	1594	1524	1687	1594	1612	1502	1594	1772	1502	1594	1683	1502
Q Serve(g_s), s	0.9	2.5	2.6	0.0	4.9	1.1	1.1	0.0	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.9	2.5	2.6	0.0	4.9	1.1	1.1	0.0	0.0	0.0	0.0	0.1
Prop In Lane	1.00		0.28	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	74	1535	567	4	1407	437	84	540	457	4	223	199
V/C Ratio(X)	0.56	0.27	0.28	0.24	0.53	0.14	0.57	0.00	0.00	0.00	0.00	0.02
Avail Cap(c_a), veh/h	211	2184	806	211	2311	717	288	870	737	444	992	885
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	17.6	9.1	9.2	18.8	11.2	9.9	17.4	9.1	9.1	0.0	0.0	14.2
Incr Delay (d2), s/veh	6.4	0.1	0.3	26.4	0.3	0.1	6.1	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.6	0.7	0.0	1.4	0.3	0.5	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.0	9.2	9.4	45.2	11.5	10.0	23.5	9.1	9.1	0.0	0.0	14.2
LnGrp LOS	C	A	A	D	B	B	C	A	A	A	A	B
Approach Vol, veh/h		614			812			50			3	
Approach Delay, s/veh		10.3			11.5			23.0			14.2	
Approach LOS		B			B			C			B	

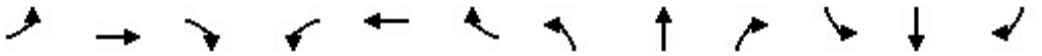
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	0.0	16.0	4.6	17.2	6.5	9.5	6.2	15.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	18.5	5.0	18.0	6.8	22.2	5.0	18.0
Max Q Clear Time (g_c+I1), s	0.0	2.0	2.0	4.6	3.1	2.1	2.9	6.9
Green Ext Time (p_c), s	0.0	0.0	0.0	3.1	0.0	0.0	0.0	4.1

Intersection Summary	
HCM 6th Ctrl Delay	11.4
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.996				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.956	
Satd. Flow (prot)	2891	6065	0	1583	4798	0	1583	1765	1500	0	1687	1500
Flt Permitted	0.950			0.950			0.732				0.741	
Satd. Flow (perm)	2891	6065	0	1583	4798	0	1220	1765	1500	0	1308	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			7				109			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



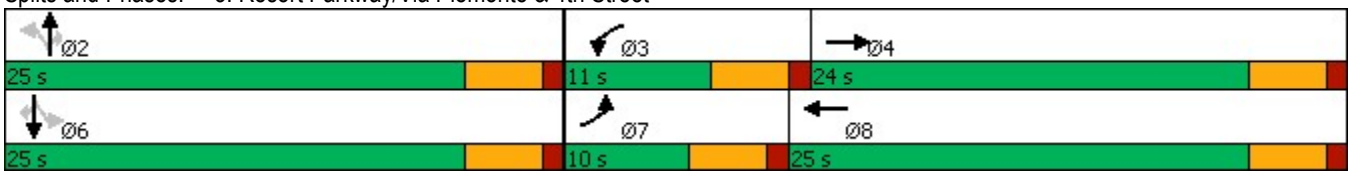
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	14	472	4	35	675	19	28	3	31	33	3	16
Future Volume (vph)	14	472	4	35	675	19	28	3	31	33	3	16
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	15	508	4	38	726	20	30	3	33	35	3	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	15	512	0	38	746	0	30	3	33	0	38	17

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	14	472	35	675	28	3	31	33	3	16
Future Volume (vph)	14	472	35	675	28	3	31	33	3	16
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8		2			6	
Permitted Phases					2		2	6		6
Detector Phase	7	4	3	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	10.0	24.0	11.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (%)	16.7%	40.0%	18.3%	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	5.8	11.9	6.4	12.0	6.8	6.8	6.8		6.8	6.8
Actuated g/C Ratio	0.20	0.40	0.22	0.41	0.23	0.23	0.23		0.23	0.23
v/c Ratio	0.03	0.21	0.11	0.38	0.11	0.01	0.08		0.13	0.04
Control Delay	14.1	6.6	13.9	7.3	13.1	12.7	0.4		13.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	14.1	6.6	13.9	7.3	13.1	12.7	0.4		13.2	0.2
LOS	B	A	B	A	B	B	A		B	A
Approach Delay		6.8		7.6		6.7			9.2	
Approach LOS		A		A		A			A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 29.6	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.38	
Intersection Signal Delay: 7.3	Intersection LOS: A
Intersection Capacity Utilization 38.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	15	512	38	746	30	3	33	38	17
v/c Ratio	0.03	0.21	0.11	0.38	0.11	0.01	0.08	0.13	0.04
Control Delay	14.1	6.6	13.9	7.3	13.1	12.7	0.4	13.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	6.6	13.9	7.3	13.1	12.7	0.4	13.2	0.2
Queue Length 50th (ft)	1	10	4	20	3	0	0	4	0
Queue Length 95th (ft)	8	39	29	71	24	6	0	28	0
Internal Link Dist (ft)		362		428		302		378	
Turn Bay Length (ft)	220		125		115		115		110
Base Capacity (vph)	570	4244	369	3531	897	1298	1132	962	1132
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.12	0.10	0.21	0.03	0.00	0.03	0.04	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	472	4	35	675	19	28	3	31	33	3	16
Future Volume (veh/h)	14	472	4	35	675	19	28	3	31	33	3	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	15	508	4	38	726	20	30	3	33	35	3	17
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	57	1953	15	73	1629	45	451	308	261	457	29	261
Arrive On Green	0.02	0.31	0.31	0.05	0.34	0.34	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	2910	6285	49	1594	4840	133	1315	1772	1502	1243	167	1502
Grp Volume(v), veh/h	15	369	143	38	483	263	30	3	33	38	0	17
Grp Sat Flow(s),veh/h/ln	1455	1524	1763	1594	1612	1748	1315	1772	1502	1410	0	1502
Q Serve(g_s), s	0.1	1.7	1.7	0.7	3.4	3.4	0.6	0.0	0.5	0.4	0.0	0.3
Cycle Q Clear(g_c), s	0.1	1.7	1.7	0.7	3.4	3.4	1.2	0.0	0.5	0.6	0.0	0.3
Prop In Lane	1.00		0.03	1.00		0.08	1.00		1.00	0.92		1.00
Lane Grp Cap(c), veh/h	57	1421	548	73	1086	589	451	308	261	486	0	261
V/C Ratio(X)	0.26	0.26	0.26	0.52	0.45	0.45	0.07	0.01	0.13	0.08	0.00	0.07
Avail Cap(c_a), veh/h	557	3102	1196	360	2300	1247	1160	1264	1071	1239	0	1071
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.9	7.4	7.4	13.4	7.4	7.4	10.6	9.8	10.0	10.0	0.0	9.9
Incr Delay (d2), s/veh	2.4	0.1	0.2	5.7	0.3	0.5	0.1	0.0	0.2	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.4	0.4	0.3	0.7	0.8	0.1	0.0	0.1	0.2	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.3	7.5	7.7	19.2	7.7	8.0	10.6	9.8	10.2	10.1	0.0	10.0
LnGrp LOS	B	A	A	B	A	A	B	A	B	B	A	B
Approach Vol, veh/h		527			784			66			55	
Approach Delay, s/veh		7.8			8.4			10.4			10.1	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	5.8	13.4		9.5	5.1	14.2				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		20.5	6.5	19.5		20.5	5.5	20.5				
Max Q Clear Time (g_c+I1), s		3.2	2.7	3.7		2.6	2.1	5.4				
Green Ext Time (p_c), s		0.1	0.0	3.0		0.2	0.0	4.3				

Intersection Summary	
HCM 6th Ctrl Delay	8.3
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.994					0.865
Flt Protected						
Satd. Flow (prot)	4789	0	0	4818	0	1526
Flt Permitted						
Satd. Flow (perm)	4789	0	0	4818	0	1526
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	528	20	0	688	0	23
Future Volume (vph)	528	20	0	688	0	23
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	574	22	0	748	0	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	596	0	0	748	0	25

Intersection Summary

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	528	20	0	688	0	23
Future Vol, veh/h	528	20	0	688	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	574	22	0	748	0	25

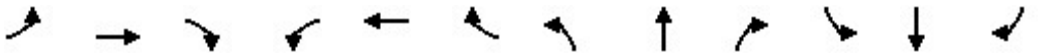
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	298
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	596
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	596
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	596	-	-	-
HCM Lane V/C Ratio	0.042	-	-	-
HCM Control Delay (s)	11.3	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5980	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5980	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			182			288			73		29	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



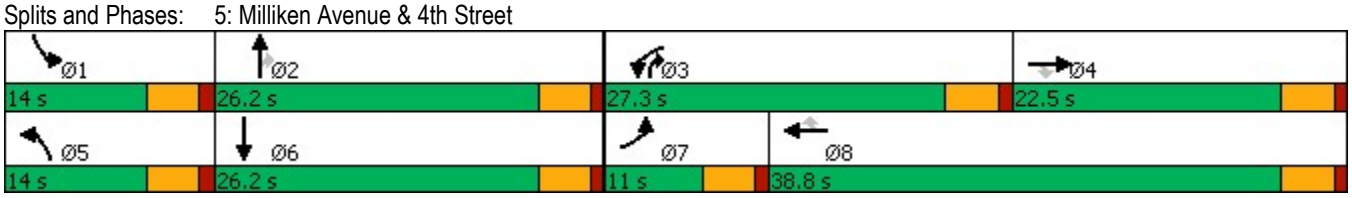
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	141	405	98	448	1152	377	191	917	150	190	795	91
Future Volume (vph)	141	405	98	448	1152	377	191	917	150	190	795	91
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	152	435	105	482	1239	405	205	986	161	204	855	98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	152	435	105	482	1239	405	205	986	161	204	953	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	141	405	98	448	1152	377	191	917	150	190	795
Future Volume (vph)	141	405	98	448	1152	377	191	917	150	190	795
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	11.0	22.5	22.5	27.3	38.8	38.8	14.0	26.2	27.3	14.0	26.2
Total Split (%)	12.2%	25.0%	25.0%	30.3%	43.1%	43.1%	15.6%	29.1%	30.3%	15.6%	29.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	6.5	19.7	19.7	19.2	32.3	32.3	9.2	20.2	43.9	9.2	20.2
Actuated g/C Ratio	0.08	0.23	0.23	0.22	0.37	0.37	0.11	0.23	0.51	0.11	0.23
v/c Ratio	0.70	0.40	0.22	0.75	0.69	0.55	0.67	0.69	0.20	0.67	0.67
Control Delay	58.5	30.7	1.4	39.6	25.2	9.4	49.9	33.4	6.8	49.7	32.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.5	30.7	1.4	39.6	25.2	9.4	49.9	33.4	6.8	49.7	32.0
LOS	E	C	A	D	C	A	D	C	A	D	C
Approach Delay		32.3			25.5			32.7			35.1
Approach LOS		C			C			C			D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 86.4	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 30.3	Intersection LOS: C
Intersection Capacity Utilization 63.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Milliken Avenue & 4th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	152	435	105	482	1239	405	205	986	161	204	953
v/c Ratio	0.70	0.40	0.22	0.75	0.69	0.55	0.67	0.69	0.20	0.67	0.67
Control Delay	58.5	30.7	1.4	39.6	25.2	9.4	49.9	33.4	6.8	49.7	32.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.5	30.7	1.4	39.6	25.2	9.4	49.9	33.4	6.8	49.7	32.0
Queue Length 50th (ft)	44	76	0	132	210	44	58	148	24	58	137
Queue Length 95th (ft)	#90	112	4	179	261	126	#102	184	53	#102	173
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	218	1099	482	767	1925	771	320	1534	860	320	1533
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.40	0.22	0.63	0.64	0.53	0.64	0.64	0.19	0.64	0.62

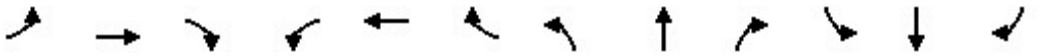
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	405	98	448	1152	377	191	917	150	190	795	91
Future Volume (veh/h)	141	405	98	448	1152	377	191	917	150	190	795	91
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	152	435	105	482	1239	405	205	986	161	204	855	98
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	216	1177	365	582	1786	555	276	1408	647	275	1291	146
Arrive On Green	0.07	0.24	0.24	0.20	0.37	0.37	0.09	0.23	0.23	0.09	0.23	0.23
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	2910	6095	1502	2910	5597	633
Grp Volume(v), veh/h	152	435	105	482	1239	405	205	986	161	204	696	257
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1455	1524	1502	1455	1524	1658
Q Serve(g_s), s	4.0	5.8	4.4	12.4	16.9	18.1	5.3	11.6	5.3	5.3	10.8	11.0
Cycle Q Clear(g_c), s	4.0	5.8	4.4	12.4	16.9	18.1	5.3	11.6	5.3	5.3	10.8	11.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.38
Lane Grp Cap(c), veh/h	216	1177	365	582	1786	555	276	1408	647	275	1054	382
V/C Ratio(X)	0.70	0.37	0.29	0.83	0.69	0.73	0.74	0.70	0.25	0.74	0.66	0.67
Avail Cap(c_a), veh/h	243	1177	365	852	2130	661	355	1698	719	355	1273	462
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.2	24.5	24.0	29.9	20.8	21.2	34.3	27.5	14.1	34.3	27.2	27.3
Incr Delay (d2), s/veh	7.8	0.2	0.4	4.5	0.8	3.4	6.0	1.0	0.2	5.9	1.0	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	2.2	1.6	4.5	6.1	6.5	2.1	4.1	1.7	2.1	3.9	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.0	24.7	24.4	34.4	21.6	24.6	40.4	28.5	14.3	40.3	28.2	30.2
LnGrp LOS	D	C	C	C	C	C	D	C	B	D	C	C
Approach Vol, veh/h		692			2126			1352			1157	
Approach Delay, s/veh		28.7			25.1			28.6			30.7	
Approach LOS		C			C			C			C	

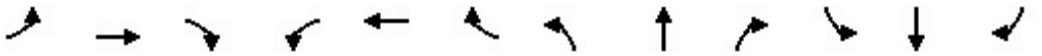
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.9	22.5	20.1	23.5	11.9	22.5	10.3	33.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	21.7	22.8	18.0	9.5	21.7	6.5	34.3
Max Q Clear Time (g_c+I1), s	7.3	13.6	14.4	7.8	7.3	13.0	6.0	20.1
Green Ext Time (p_c), s	0.1	4.4	1.2	2.4	0.1	4.1	0.0	8.6

Intersection Summary	
HCM 6th Ctrl Delay	27.7
HCM 6th LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.900	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2891	1365
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2891	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136			136			136		217	217
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



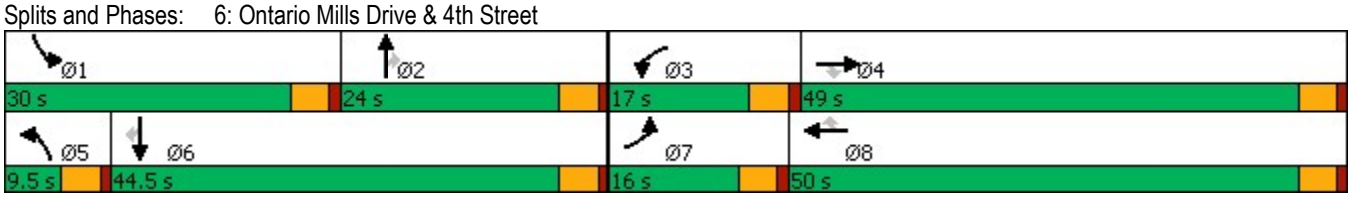
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	275	370	57	106	1253	126	69	68	75	141	214	847
Future Volume (vph)	275	370	57	106	1253	126	69	68	75	141	214	847
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	316	425	66	122	1440	145	79	78	86	162	246	974
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	316	425	66	122	1440	145	79	78	86	162	733	487

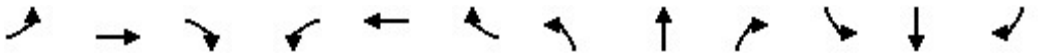
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	275	370	57	106	1253	126	69	68	75	141	214	847
Future Volume (vph)	275	370	57	106	1253	126	69	68	75	141	214	847
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	16.0	49.0	49.0	17.0	50.0	50.0	9.5	24.0	24.0	30.0	44.5	44.5
Total Split (%)	13.3%	40.8%	40.8%	14.2%	41.7%	41.7%	7.9%	20.0%	20.0%	25.0%	37.1%	37.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	11.7	43.6	43.6	10.0	41.8	41.8	5.1	21.4	21.4	16.7	33.0	33.0
Actuated g/C Ratio	0.11	0.40	0.40	0.09	0.38	0.38	0.05	0.19	0.19	0.15	0.30	0.30
v/c Ratio	1.03	0.22	0.10	0.47	0.79	0.22	1.08	0.12	0.21	0.68	0.72	0.87
Control Delay	108.7	23.6	0.3	56.0	34.5	5.9	183.2	39.6	2.7	59.7	28.0	36.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	108.7	23.6	0.3	56.0	34.5	5.9	183.2	39.6	2.7	59.7	28.0	36.9
LOS	F	C	A	E	C	A	F	D	A	E	C	D
Approach Delay		55.0			33.6			73.2			34.8	
Approach LOS		E			C			E			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 110	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 40.5	Intersection LOS: D
Intersection Capacity Utilization 78.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Ontario Mills Drive & 4th Street



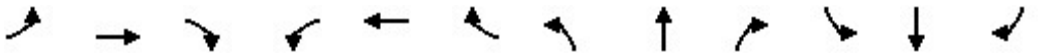


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	316	425	66	122	1440	145	79	78	86	162	733	487
v/c Ratio	1.03	0.22	0.10	0.47	0.79	0.22	1.08	0.12	0.21	0.68	0.72	0.87
Control Delay	108.7	23.6	0.3	56.0	34.5	5.9	183.2	39.6	2.7	59.7	28.0	36.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	108.7	23.6	0.3	56.0	34.5	5.9	183.2	39.6	2.7	59.7	28.0	36.9
Queue Length 50th (ft)	~145	79	0	46	354	4	~73	25	0	120	188	221
Queue Length 95th (ft)	#228	105	0	75	398	42	#169	48	8	178	246	363
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	308	2011	705	334	2031	711	73	693	418	374	1208	642
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.21	0.09	0.37	0.71	0.20	1.08	0.11	0.21	0.43	0.61	0.76

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



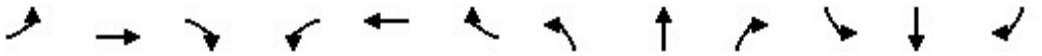
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	275	370	57	106	1253	126	69	68	75	141	214	847
Future Volume (veh/h)	275	370	57	106	1253	126	69	68	75	141	214	847
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	316	425	66	122	1440	145	79	78	86	162	246	974
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	290	1934	600	171	1735	539	69	896	400	190	606	1027
Arrive On Green	0.10	0.40	0.40	0.06	0.36	0.36	0.04	0.27	0.27	0.12	0.34	0.34
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	1594	3367	1502	1594	1772	3003
Grp Volume(v), veh/h	316	425	66	122	1440	145	79	78	86	162	246	974
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1594	1683	1502	1594	1772	1502
Q Serve(g_s), s	11.5	6.7	3.2	4.7	31.3	7.9	5.0	2.0	5.1	11.5	12.2	36.4
Cycle Q Clear(g_c), s	11.5	6.7	3.2	4.7	31.3	7.9	5.0	2.0	5.1	11.5	12.2	36.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	290	1934	600	171	1735	539	69	896	400	190	606	1027
V/C Ratio(X)	1.09	0.22	0.11	0.71	0.83	0.27	1.14	0.09	0.22	0.85	0.41	0.95
Avail Cap(c_a), veh/h	290	1934	600	316	1910	593	69	896	400	353	615	1043
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.9	22.7	21.7	53.3	33.7	26.2	55.1	31.8	32.9	49.8	29.0	36.9
Incr Delay (d2), s/veh	78.3	0.1	0.1	5.5	3.0	0.3	152.0	0.0	0.3	10.3	0.4	16.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	2.5	1.1	1.9	12.5	2.9	4.9	0.8	1.9	5.1	5.3	15.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	130.2	22.8	21.8	58.8	36.7	26.5	207.1	31.8	33.2	60.1	29.4	53.7
LnGrp LOS	F	C	C	E	D	C	F	C	C	E	C	D
Approach Vol, veh/h		807			1707			243			1382	
Approach Delay, s/veh		64.8			37.4			89.3			50.2	
Approach LOS		E			D			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.2	35.2	11.3	50.6	9.5	43.9	16.0	45.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	25.5	19.5	12.5	44.5	5.0	40.0	11.5	45.5
Max Q Clear Time (g_c+I1), s	13.5	7.1	6.7	8.7	7.0	38.4	13.5	33.3
Green Ext Time (p_c), s	0.3	0.5	0.2	3.4	0.0	1.0	0.0	8.0

Intersection Summary	
HCM 6th Ctrl Delay	50.1
HCM 6th LOS	D

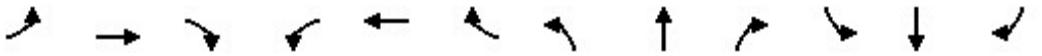
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.983			0.891				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.966	
Satd. Flow (prot)	2891	4818	1500	1583	4736	0	1583	2987	0	1504	1619	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.966	
Satd. Flow (perm)	2891	4818	1500	1583	4736	0	1583	2987	0	1504	1619	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127		25			58				512
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



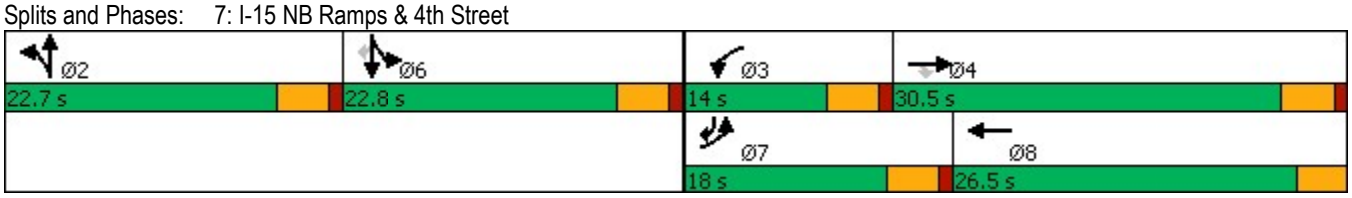
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	205	334	74	43	460	60	106	21	55	356	63	924
Future Volume (vph)	205	334	74	43	460	60	106	21	55	356	63	924
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	216	352	78	45	484	63	112	22	58	375	66	973
Shared Lane Traffic (%)										42%		
Lane Group Flow (vph)	216	352	78	45	547	0	112	80	0	217	224	973

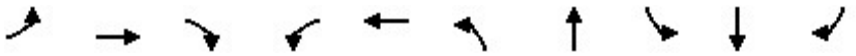
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	205	334	74	43	460	106	21	356	63	924
Future Volume (vph)	205	334	74	43	460	106	21	356	63	924
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	18.0	30.5	30.5	14.0	26.5	22.7	22.7	22.8	22.8	18.0
Total Split (%)	20.0%	33.9%	33.9%	15.6%	29.4%	25.2%	25.2%	25.3%	25.3%	20.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	11.7	22.4	22.4	7.5	14.0	10.4	10.4	14.8	14.8	31.2
Actuated g/C Ratio	0.17	0.33	0.33	0.11	0.20	0.15	0.15	0.22	0.22	0.46
v/c Ratio	0.44	0.22	0.14	0.26	0.56	0.46	0.16	0.67	0.64	0.66
Control Delay	30.8	20.3	2.0	35.8	26.6	35.6	13.1	38.0	35.7	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.8	20.3	2.0	35.8	26.6	35.6	13.1	38.0	35.7	9.3
LOS	C	C	A	D	C	D	B	D	D	A
Approach Delay		21.6			27.3		26.2		17.9	
Approach LOS		C			C		C		B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 68.5	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 21.3	Intersection LOS: C
Intersection Capacity Utilization 62.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street

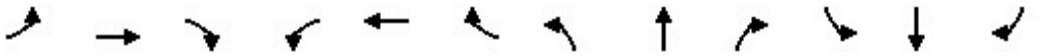




Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	216	352	78	45	547	112	80	217	224	973
v/c Ratio	0.44	0.22	0.14	0.26	0.56	0.46	0.16	0.67	0.64	0.66
Control Delay	30.8	20.3	2.0	35.8	26.6	35.6	13.1	38.0	35.7	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.8	20.3	2.0	35.8	26.6	35.6	13.1	38.0	35.7	9.3
Queue Length 50th (ft)	43	44	0	18	74	45	4	89	91	71
Queue Length 95th (ft)	88	78	11	53	121	101	23	#203	192	175
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	589	1903	669	227	1660	434	862	415	447	1548
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.18	0.12	0.20	0.33	0.26	0.09	0.52	0.50	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	334	74	43	460	60	106	21	55	356	63	924
Future Volume (veh/h)	205	334	74	43	460	60	106	21	55	356	63	924
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	216	352	78	45	484	63	112	22	58	422	0	973
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	314	1214	377	70	811	104	174	184	164	958	0	1227
Arrive On Green	0.11	0.25	0.25	0.04	0.19	0.19	0.11	0.11	0.11	0.30	0.00	0.30
Sat Flow, veh/h	2910	4837	1502	1594	4341	556	1594	1683	1502	3188	0	3003
Grp Volume(v), veh/h	216	352	78	45	357	190	112	22	58	422	0	973
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1594	1612	1672	1594	1683	1502	1594	0	1502
Q Serve(g_s), s	4.4	3.6	2.5	1.7	6.2	6.3	4.1	0.7	2.2	6.5	0.0	17.3
Cycle Q Clear(g_c), s	4.4	3.6	2.5	1.7	6.2	6.3	4.1	0.7	2.2	6.5	0.0	17.3
Prop In Lane	1.00		1.00	1.00		0.33	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	314	1214	377	70	602	312	174	184	164	958	0	1227
V/C Ratio(X)	0.69	0.29	0.21	0.65	0.59	0.61	0.64	0.12	0.35	0.44	0.00	0.79
Avail Cap(c_a), veh/h	645	2065	641	249	1218	631	476	503	449	958	0	1227
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.2	18.4	18.0	28.7	22.6	22.7	26.0	24.5	25.1	17.2	0.0	15.8
Incr Delay (d2), s/veh	2.7	0.1	0.3	9.6	0.9	1.9	3.9	0.3	1.3	0.3	0.0	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	1.3	0.8	0.8	2.3	2.5	1.7	0.3	0.8	2.2	0.0	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.8	18.6	18.3	38.2	23.6	24.6	29.9	24.8	26.4	17.5	0.0	19.4
LnGrp LOS	C	B	B	D	C	C	C	C	C	B	A	B
Approach Vol, veh/h		646			592			192			1395	
Approach Delay, s/veh		22.0			25.0			28.3			18.8	
Approach LOS		C			C			C			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		11.2	7.2	19.8		22.8	11.1	15.9				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		18.2	9.5	26.0		18.3	13.5	* 23				
Max Q Clear Time (g_c+I1), s		6.1	3.7	5.6		19.3	6.4	8.3				
Green Ext Time (p_c), s		0.6	0.0	2.5		0.0	0.4	3.0				

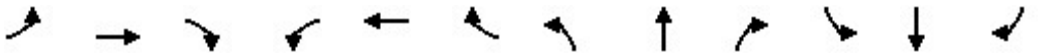
Intersection Summary	
HCM 6th Ctrl Delay	21.5
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

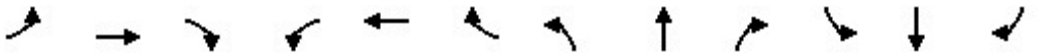
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

User approved changes to right turn type.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.903				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3028	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3028	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		87				182			182			182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



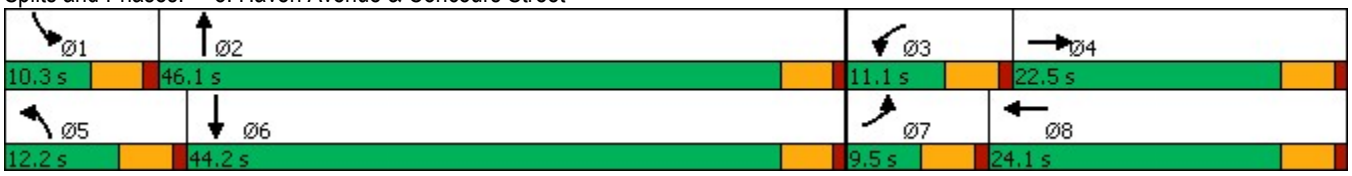
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	20	43	78	157	57	17	68	1742	141	93	1352	42
Future Volume (vph)	20	43	78	157	57	17	68	1742	141	93	1352	42
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	22	48	87	174	63	19	76	1936	157	103	1502	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	135	0	174	63	19	76	1936	157	103	1502	47

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	20	43	157	57	17	68	1742	141	93	1352	42
Future Volume (vph)	20	43	157	57	17	68	1742	141	93	1352	42
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	11.1	24.1		12.2	46.1		10.3	44.2	
Total Split (%)	10.6%	25.0%	12.3%	26.8%		13.6%	51.2%		11.4%	49.1%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.1	7.0	6.7	14.6	75.2	7.0	40.1	75.2	5.9	38.9	75.2
Actuated g/C Ratio	0.07	0.09	0.09	0.19	1.00	0.09	0.53	1.00	0.08	0.52	1.00
v/c Ratio	0.11	0.38	0.50	0.10	0.01	0.28	0.60	0.10	0.46	0.48	0.03
Control Delay	37.0	17.8	39.9	29.7	0.0	36.6	13.5	0.1	42.5	12.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	17.8	39.9	29.7	0.0	36.6	13.5	0.1	42.5	12.9	0.0
LOS	D	B	D	C	A	D	B	A	D	B	A
Approach Delay		20.5		34.4			13.4			14.4	
Approach LOS		C		C			B			B	

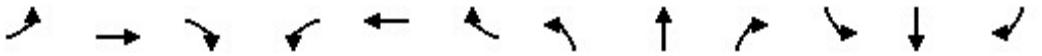
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 75.2	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization 54.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	22	135	174	63	19	76	1936	157	103	1502	47
v/c Ratio	0.11	0.38	0.50	0.10	0.01	0.28	0.60	0.10	0.46	0.48	0.03
Control Delay	37.0	17.8	39.9	29.7	0.0	36.6	13.5	0.1	42.5	12.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	17.8	39.9	29.7	0.0	36.6	13.5	0.1	42.5	12.9	0.0
Queue Length 50th (ft)	5	11	29	12	0	18	178	0	25	131	0
Queue Length 95th (ft)	17	37	52	33	0	39	230	0	51	173	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	195	801	351	887	1500	300	3409	1500	226	3274	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.17	0.50	0.07	0.01	0.25	0.57	0.10	0.46	0.46	0.03

Intersection Summary



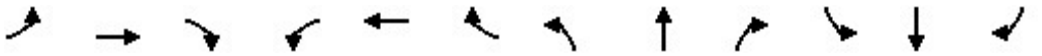
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	43	78	157	57	17	68	1742	141	93	1352	42
Future Volume (veh/h)	20	43	78	157	57	17	68	1742	141	93	1352	42
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	22	48	87	174	63	0	76	1936	0	103	1502	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	73	154	138	284	465		164	3081		185	3125	
Arrive On Green	0.03	0.09	0.09	0.07	0.14	0.00	0.06	0.51	0.00	0.06	0.51	0.00
Sat Flow, veh/h	2910	1683	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	22	48	87	174	63	0	76	1936	0	103	1502	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	0.5	1.8	3.8	2.9	1.1	0.0	1.7	15.5	0.0	2.3	10.7	0.0
Cycle Q Clear(g_c), s	0.5	1.8	3.8	2.9	1.1	0.0	1.7	15.5	0.0	2.3	10.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	73	154	138	284	465		164	3081		185	3125	
V/C Ratio(X)	0.30	0.31	0.63	0.61	0.14		0.46	0.63		0.56	0.48	
Avail Cap(c_a), veh/h	216	451	402	389	982		333	3773		251	3600	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.2	28.5	29.4	30.3	25.4	0.0	30.7	12.0	0.0	30.6	10.6	0.0
Incr Delay (d2), s/veh	2.3	1.1	4.7	2.2	0.1	0.0	2.0	0.2	0.0	2.6	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.7	1.5	0.9	0.4	0.0	0.6	4.6	0.0	0.8	3.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.5	29.7	34.2	32.5	25.6	0.0	32.8	12.3	0.0	33.2	10.7	0.0
LnGrp LOS	C	C	C	C	C		C	B		C	B	
Approach Vol, veh/h		157			237	A		2012	A		1605	A
Approach Delay, s/veh		32.8			30.6			13.0			12.1	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.8	38.5	9.3	10.7	8.3	39.0	6.2	13.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.8	41.6	6.6	18.0	7.7	39.7	5.0	19.6
Max Q Clear Time (g_c+I1), s	4.3	17.5	4.9	5.8	3.7	12.7	2.5	3.1
Green Ext Time (p_c), s	0.0	16.5	0.1	0.5	0.1	13.3	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	14.5
HCM 6th LOS	B

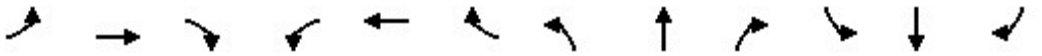
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.992			0.973			0.994			0.979	
Flt Protected	0.950	0.955			0.971		0.950			0.950		
Satd. Flow (prot)	1593	1588	0	0	1667	0	1676	4789	0	1676	4716	0
Flt Permitted	0.950	0.955					0.950			0.950		
Satd. Flow (perm)	1593	1588	0	0	1717	0	1676	4789	0	1676	4716	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		143			1			7			36	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



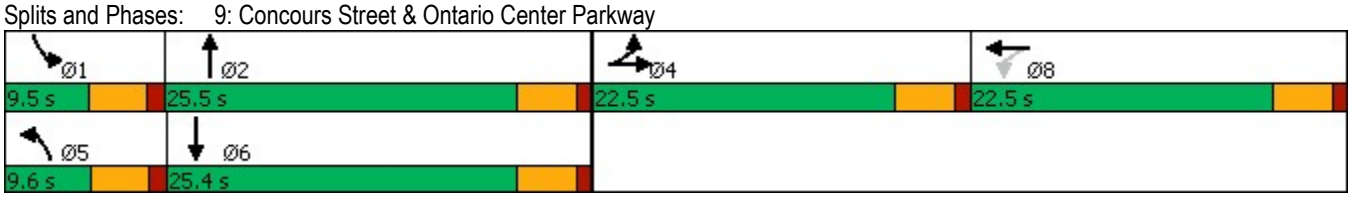
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	99	0	3	3	1	1	47	476	20	1	656	104
Future Volume (vph)	99	0	3	3	1	1	47	476	20	1	656	104
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	110	0	3	3	1	1	52	529	22	1	729	116
Shared Lane Traffic (%)	48%											
Lane Group Flow (vph)	57	56	0	0	5	0	52	551	0	1	845	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	99	0	3	1	47	476	1	656
Future Volume (vph)	99	0	3	1	47	476	1	656
Turn Type	Split	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	4	4		8	5	2	1	6
Permitted Phases			8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	9.6	25.5	9.5	25.4
Total Split (%)	28.1%	28.1%	28.1%	28.1%	12.0%	31.9%	11.9%	31.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	7.4	7.4		6.1	5.5	26.0	5.3	24.1
Actuated g/C Ratio	0.18	0.18		0.15	0.13	0.63	0.13	0.58
v/c Ratio	0.20	0.14		0.02	0.24	0.18	0.00	0.31
Control Delay	19.6	0.7		19.5	23.5	6.7	22.0	8.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	19.6	0.7		19.5	23.5	6.7	22.0	8.4
LOS	B	A		B	C	A	C	A
Approach Delay		10.2		19.5		8.2		8.4
Approach LOS		B		B		A		A

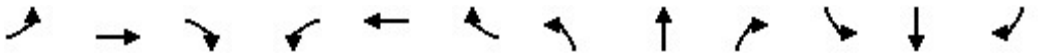
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 41.4	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.31	
Intersection Signal Delay: 8.5	Intersection LOS: A
Intersection Capacity Utilization 35.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	57	56	5	52	551	1	845
v/c Ratio	0.20	0.14	0.02	0.24	0.18	0.00	0.31
Control Delay	19.6	0.7	19.5	23.5	6.7	22.0	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.6	0.7	19.5	23.5	6.7	22.0	8.4
Queue Length 50th (ft)	9	0	1	9	15	0	24
Queue Length 95th (ft)	48	0	10	48	75	5	115
Internal Link Dist (ft)		319	68		111		176
Turn Bay Length (ft)	170			115		120	
Base Capacity (vph)	740	814	798	220	3040	216	2883
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.07	0.01	0.24	0.18	0.00	0.29

Intersection Summary



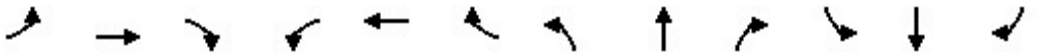
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	0	3	3	1	1	47	476	20	1	656	104
Future Volume (veh/h)	99	0	3	3	1	1	47	476	20	1	656	104
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	113	0	0	3	1	1	52	529	22	1	729	116
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	320	168	0	7	2	2	95	1849	77	5	1403	221
Arrive On Green	0.09	0.00	0.00	0.01	0.01	0.01	0.06	0.39	0.39	0.00	0.33	0.33
Sat Flow, veh/h	3375	1772	0	997	332	332	1688	4764	197	1688	4213	664
Grp Volume(v), veh/h	113	0	0	5	0	0	52	357	194	1	556	289
Grp Sat Flow(s),veh/h/ln	1688	1772	0	1662	0	0	1688	1612	1736	1688	1612	1652
Q Serve(g_s), s	1.1	0.0	0.0	0.1	0.0	0.0	1.1	2.7	2.7	0.0	4.9	5.0
Cycle Q Clear(g_c), s	1.1	0.0	0.0	0.1	0.0	0.0	1.1	2.7	2.7	0.0	4.9	5.0
Prop In Lane	1.00		0.00	0.60		0.20	1.00		0.11	1.00		0.40
Lane Grp Cap(c), veh/h	320	168	0	11	0	0	95	1252	674	5	1074	550
V/C Ratio(X)	0.35	0.00	0.00	0.44	0.00	0.00	0.54	0.29	0.29	0.21	0.52	0.52
Avail Cap(c_a), veh/h	1718	902	0	846	0	0	243	1915	1031	239	1905	976
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.0	0.0	0.0	17.5	0.0	0.0	16.2	7.4	7.5	17.6	9.5	9.5
Incr Delay (d2), s/veh	0.7	0.0	0.0	25.1	0.0	0.0	4.8	0.1	0.2	20.4	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.1	0.0	0.0	0.5	0.7	0.7	0.0	1.3	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.7	0.0	0.0	42.5	0.0	0.0	21.0	7.6	7.7	38.1	9.9	10.3
LnGrp LOS	B	A	A	D	A	A	C	A	A	D	A	B
Approach Vol, veh/h		113			5			603			846	
Approach Delay, s/veh		15.7			42.5			8.8			10.1	
Approach LOS		B			D			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.5	18.2		7.9	6.5	16.3		4.7				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	21.0		18.0	5.1	20.9		18.0				
Max Q Clear Time (g_c+I1), s	2.0	4.7		3.1	3.1	7.0		2.1				
Green Ext Time (p_c), s	0.0	3.2		0.3	0.0	4.8		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		10.1
HCM 6th LOS		B

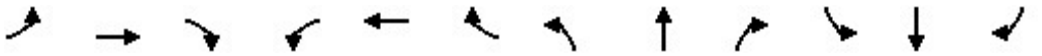
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			234			234			234			280
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



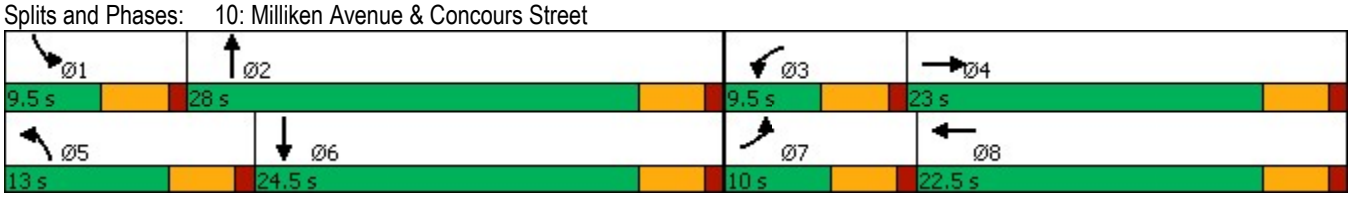
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	97	23	119	47	75	38	184	902	57	51	864	241
Future Volume (vph)	97	23	119	47	75	38	184	902	57	51	864	241
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	113	27	138	55	87	44	214	1049	66	59	1005	280
Shared Lane Traffic (%)												
Lane Group Flow (vph)	113	27	138	55	87	44	214	1049	66	59	1005	280

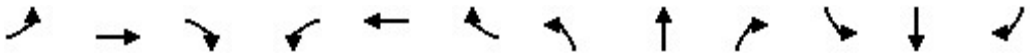
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	97	23	119	47	75	38	184	902	57	51	864	241
Future Volume (vph)	97	23	119	47	75	38	184	902	57	51	864	241
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	10.0	23.0		9.5	22.5		13.0	28.0		9.5	24.5	
Total Split (%)	14.3%	32.9%		13.6%	32.1%		18.6%	40.0%		13.6%	35.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	5.6	11.0	54.3	5.1	6.9	54.3	8.1	29.3	54.3	5.1	20.6	54.3
Actuated g/C Ratio	0.10	0.20	1.00	0.09	0.13	1.00	0.15	0.54	1.00	0.09	0.38	1.00
v/c Ratio	0.38	0.04	0.09	0.20	0.20	0.03	0.49	0.32	0.04	0.22	0.44	0.19
Control Delay	29.2	21.0	0.1	27.2	24.3	0.0	27.3	11.1	0.1	27.4	15.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.2	21.0	0.1	27.2	24.3	0.0	27.3	11.1	0.1	27.4	15.3	0.3
LOS	C	C	A	C	C	A	C	B	A	C	B	A
Approach Delay		13.9			19.4			13.2			12.7	
Approach LOS		B			B			B			B	

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 54.3	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 40.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 10: Milliken Avenue & Concours Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	113	27	138	55	87	44	214	1049	66	59	1005	280
v/c Ratio	0.38	0.04	0.09	0.20	0.20	0.03	0.49	0.32	0.04	0.22	0.44	0.19
Control Delay	29.2	21.0	0.1	27.2	24.3	0.0	27.3	11.1	0.1	27.4	15.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.2	21.0	0.1	27.2	24.3	0.0	27.3	11.1	0.1	27.4	15.3	0.3
Queue Length 50th (ft)	19	3	0	9	14	0	35	75	0	10	79	0
Queue Length 95th (ft)	40	13	0	23	31	0	64	99	0	25	104	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	299	1168	1500	272	1137	1500	463	3301	1500	272	2429	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.02	0.09	0.20	0.08	0.03	0.46	0.32	0.04	0.22	0.41	0.19

Intersection Summary

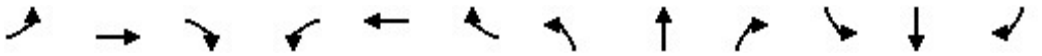
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	97	23	119	47	75	38	184	902	57	51	864	241
Future Volume (veh/h)	97	23	119	47	75	38	184	902	57	51	864	241
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	113	27	0	55	87	0	214	1049	0	59	1005	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	245	428		161	330		325	2177		169	1850	
Arrive On Green	0.08	0.13	0.00	0.06	0.10	0.00	0.11	0.36	0.00	0.06	0.30	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	113	27	0	55	87	0	214	1049	0	59	1005	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	1.7	0.3	0.0	0.8	1.1	0.0	3.2	6.0	0.0	0.9	6.2	0.0
Cycle Q Clear(g_c), s	1.7	0.3	0.0	0.8	1.1	0.0	3.2	6.0	0.0	0.9	6.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	245	428		161	330		325	2177		169	1850	
V/C Ratio(X)	0.46	0.06		0.34	0.26		0.66	0.48		0.35	0.54	
Avail Cap(c_a), veh/h	358	1392		325	1355		553	3202		325	2725	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.5	17.2	0.0	20.3	18.7	0.0	19.1	11.2	0.0	20.3	13.0	0.0
Incr Delay (d2), s/veh	1.3	0.1	0.0	1.2	0.4	0.0	2.3	0.2	0.0	1.2	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.1	0.0	0.3	0.4	0.0	1.0	1.6	0.0	0.3	1.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.9	17.2	0.0	21.6	19.1	0.0	21.3	11.3	0.0	21.5	13.2	0.0
LnGrp LOS	C	B		C	B		C	B		C	B	
Approach Vol, veh/h		140	A		142	A		1263	A		1064	A
Approach Delay, s/veh		20.2			20.1			13.0			13.7	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	20.5	7.0	10.2	9.5	18.1	8.3	8.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	23.5	5.0	18.5	8.5	20.0	5.5	18.0
Max Q Clear Time (g_c+I1), s	2.9	8.0	2.8	2.3	5.2	8.2	3.7	3.1
Green Ext Time (p_c), s	0.0	6.7	0.0	0.1	0.2	5.4	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	14.1
HCM 6th LOS	B

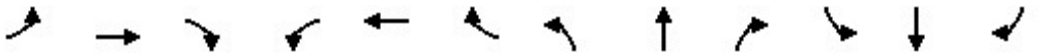
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			236			433			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



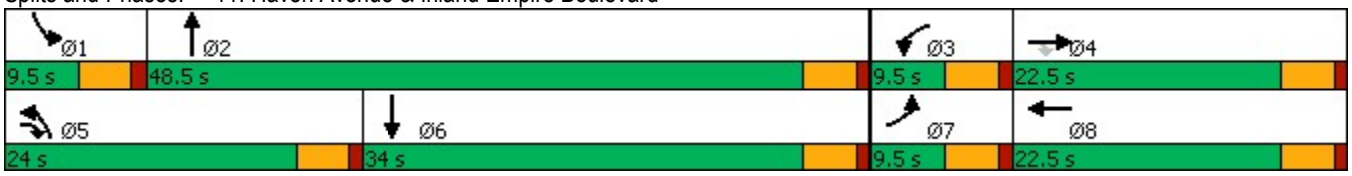
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	51	94	230	113	99	20	442	2014	622	50	1331	72
Future Volume (vph)	51	94	230	113	99	20	442	2014	622	50	1331	72
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	55	101	247	122	106	22	475	2166	669	54	1431	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	101	247	122	106	22	475	2166	669	54	1431	77

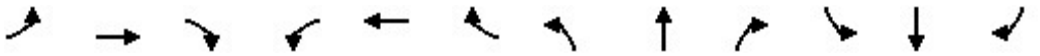
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	94	230	113	99	20	442	2014	622	50	1331	72
Future Volume (vph)	51	94	230	113	99	20	442	2014	622	50	1331	72
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	24.0	9.5	22.5		24.0	48.5		9.5	34.0	
Total Split (%)	10.6%	25.0%	26.7%	10.6%	25.0%		26.7%	53.9%		10.6%	37.8%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.4	8.1	26.6	5.4	9.9	71.1	17.3	46.7	71.1	5.4	27.9	71.1
Actuated g/C Ratio	0.08	0.11	0.37	0.08	0.14	1.00	0.24	0.66	1.00	0.08	0.39	1.00
v/c Ratio	0.25	0.27	0.41	0.41	0.23	0.01	0.67	0.54	0.45	0.25	0.60	0.05
Control Delay	39.1	34.8	14.0	40.8	33.2	0.0	32.1	10.9	1.0	39.1	20.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	34.8	14.0	40.8	33.2	0.0	32.1	10.9	1.0	39.1	20.3	0.1
LOS	D	C	B	D	C	A	C	B	A	D	C	A
Approach Delay		22.7			34.0			11.9			19.9	
Approach LOS		C			C			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 71.1	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 16.0	Intersection LOS: B
Intersection Capacity Utilization 56.0%	ICU Level of Service B
Analysis Period (min) 15	

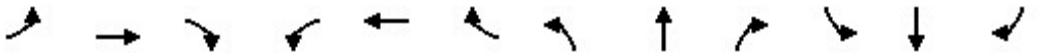
Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	55	101	247	122	106	22	475	2166	669	54	1431	77
v/c Ratio	0.25	0.27	0.41	0.41	0.23	0.01	0.67	0.54	0.45	0.25	0.60	0.05
Control Delay	39.1	34.8	14.0	40.8	33.2	0.0	32.1	10.9	1.0	39.1	20.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	34.8	14.0	40.8	33.2	0.0	32.1	10.9	1.0	39.1	20.3	0.1
Queue Length 50th (ft)	13	25	58	21	26	0	111	203	0	13	166	0
Queue Length 95th (ft)	32	48	114	40	50	0	166	256	0	31	214	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	219	915	680	298	915	1500	854	3989	1500	219	2721	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.11	0.36	0.41	0.12	0.01	0.56	0.54	0.45	0.25	0.53	0.05

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	94	230	113	99	20	442	2014	622	50	1331	72
Future Volume (veh/h)	51	94	230	113	99	20	442	2014	622	50	1331	72
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	55	101	247	122	106	0	475	2166	0	54	1431	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	130	546	535	235	595		564	3077		128	2164	
Arrive On Green	0.04	0.16	0.16	0.06	0.18	0.00	0.19	0.50	0.00	0.04	0.36	0.00
Sat Flow, veh/h	2910	3367	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	55	101	247	122	106	0	475	2166	0	54	1431	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	1.4	2.0	9.9	2.3	2.1	0.0	12.3	21.4	0.0	1.4	15.5	0.0
Cycle Q Clear(g_c), s	1.4	2.0	9.9	2.3	2.1	0.0	12.3	21.4	0.0	1.4	15.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	130	546	535	235	595		564	3077		128	2164	
V/C Ratio(X)	0.42	0.19	0.46	0.52	0.18		0.84	0.70		0.42	0.66	
Avail Cap(c_a), veh/h	186	773	636	253	773		724	3422		186	2294	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	36.5	28.4	19.5	35.8	27.4	0.0	30.4	14.9	0.0	36.5	21.3	0.0
Incr Delay (d2), s/veh	2.2	0.2	0.6	1.8	0.1	0.0	7.1	0.6	0.0	2.2	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.8	3.4	0.8	0.8	0.0	4.7	6.8	0.0	0.5	5.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.7	28.5	20.1	37.5	27.6	0.0	37.5	15.5	0.0	38.7	22.0	0.0
LnGrp LOS	D	C	C	D	C		D	B		D	C	
Approach Vol, veh/h		403			228	A		2641	A		1485	A
Approach Delay, s/veh		24.7			32.9			19.5			22.6	
Approach LOS		C			C			B			C	

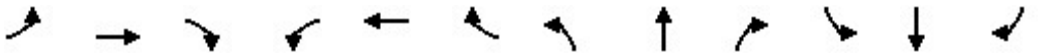
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	44.1	9.1	17.2	19.7	32.3	8.0	18.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	44.0	5.0	18.0	19.5	29.5	5.0	18.0
Max Q Clear Time (g_c+I1), s	3.4	23.4	4.3	11.9	14.3	17.5	3.4	4.1
Green Ext Time (p_c), s	0.0	16.2	0.0	0.8	0.9	7.6	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	21.5
HCM 6th LOS	C

Notes

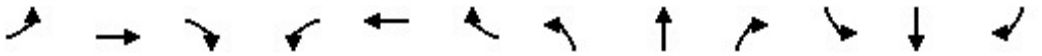
User approved changes to right turn type.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			236			236			236			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



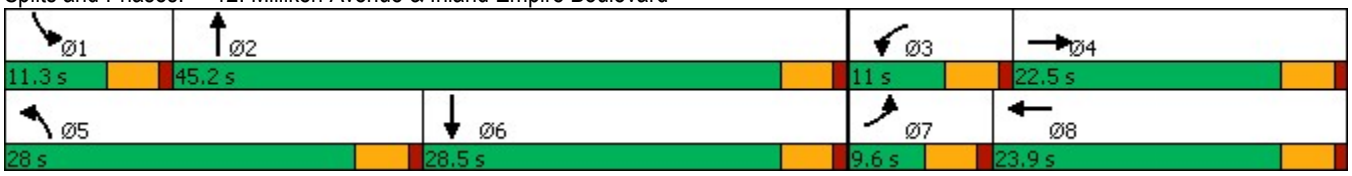
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	61	32	50	95	75	19	390	1044	106	31	862	125
Future Volume (vph)	61	32	50	95	75	19	390	1044	106	31	862	125
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	71	37	58	110	87	22	453	1214	123	36	1002	145
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	37	58	110	87	22	453	1214	123	36	1002	145

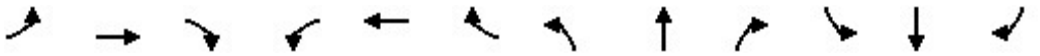
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	32	50	95	75	19	390	1044	106	31	862	125
Future Volume (vph)	61	32	50	95	75	19	390	1044	106	31	862	125
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.6	22.5		11.0	23.9		28.0	45.2		11.3	28.5	
Total Split (%)	10.7%	25.0%		12.2%	26.6%		31.1%	50.2%		12.6%	31.7%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	5.8	7.1	61.5	9.1	7.9	61.5	15.9	39.1	61.5	6.9	19.8	61.5
Actuated g/C Ratio	0.09	0.12	1.00	0.15	0.13	1.00	0.26	0.64	1.00	0.11	0.32	1.00
v/c Ratio	0.26	0.10	0.04	0.26	0.20	0.01	0.61	0.31	0.08	0.11	0.51	0.10
Control Delay	34.9	31.1	0.0	32.0	30.6	0.0	26.4	8.8	0.1	31.8	19.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	31.1	0.0	32.0	30.6	0.0	26.4	8.8	0.1	31.8	19.8	0.1
LOS	C	C	A	C	C	A	C	A	A	C	B	A
Approach Delay		21.9			28.2			12.7			17.7	
Approach LOS		C			C			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 61.5	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 15.9	Intersection LOS: B
Intersection Capacity Utilization 47.5%	ICU Level of Service A
Analysis Period (min) 15	

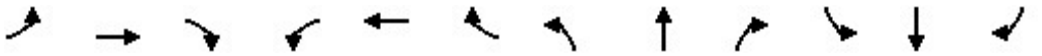
Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	71	37	58	110	87	22	453	1214	123	36	1002	145
v/c Ratio	0.26	0.10	0.04	0.26	0.20	0.01	0.61	0.31	0.08	0.11	0.51	0.10
Control Delay	34.9	31.1	0.0	32.0	30.6	0.0	26.4	8.8	0.1	31.8	19.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	31.1	0.0	32.0	30.6	0.0	26.4	8.8	0.1	31.8	19.8	0.1
Queue Length 50th (ft)	14	7	0	22	17	0	87	61	0	7	98	0
Queue Length 95th (ft)	35	21	0	48	39	0	134	119	0	21	139	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	274	1123	1500	440	1211	1500	1264	4077	1500	366	2712	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.03	0.04	0.25	0.07	0.01	0.36	0.30	0.08	0.10	0.37	0.10

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	32	50	95	75	19	390	1044	106	31	862	125
Future Volume (veh/h)	61	32	50	95	75	19	390	1044	106	31	862	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	71	37	0	110	87	0	453	1214	0	36	1002	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	177	297		219	345		609	2814		113	1774	
Arrive On Green	0.06	0.09	0.00	0.08	0.10	0.00	0.21	0.46	0.00	0.04	0.29	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	71	37	0	110	87	0	453	1214	0	36	1002	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	1.3	0.5	0.0	1.9	1.3	0.0	7.8	7.2	0.0	0.6	7.5	0.0
Cycle Q Clear(g_c), s	1.3	0.5	0.0	1.9	1.3	0.0	7.8	7.2	0.0	0.6	7.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	177	297		219	345		609	2814		113	1774	
V/C Ratio(X)	0.40	0.12		0.50	0.25		0.74	0.43		0.32	0.56	
Avail Cap(c_a), veh/h	277	1132		353	1220		1277	4633		370	2732	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.2	22.5	0.0	23.8	22.1	0.0	19.8	9.7	0.0	25.1	16.1	0.0
Incr Delay (d2), s/veh	1.5	0.2	0.0	1.8	0.4	0.0	1.8	0.1	0.0	1.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.2	0.0	0.7	0.5	0.0	2.5	2.0	0.0	0.2	2.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.7	22.7	0.0	25.6	22.5	0.0	21.6	9.8	0.0	26.7	16.4	0.0
LnGrp LOS	C	C		C	C		C	A		C	B	
Approach Vol, veh/h		108	A		197	A		1667	A		1038	A
Approach Delay, s/veh		24.6			24.2			13.0			16.7	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.6	29.2	8.5	9.2	15.7	20.1	7.8	10.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.8	40.7	6.5	18.0	23.5	24.0	5.1	19.4
Max Q Clear Time (g_c+I1), s	2.6	9.2	3.9	2.5	9.8	9.5	3.3	3.3
Green Ext Time (p_c), s	0.0	10.8	0.1	0.1	1.4	6.1	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	15.5
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.943	0.850				
Flt Protected	0.970					
Satd. Flow (prot)	2958	1365	6071	0	0	6071
Flt Permitted	0.970					
Satd. Flow (perm)	2958	1365	6071	0	0	6071
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	2	2				
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

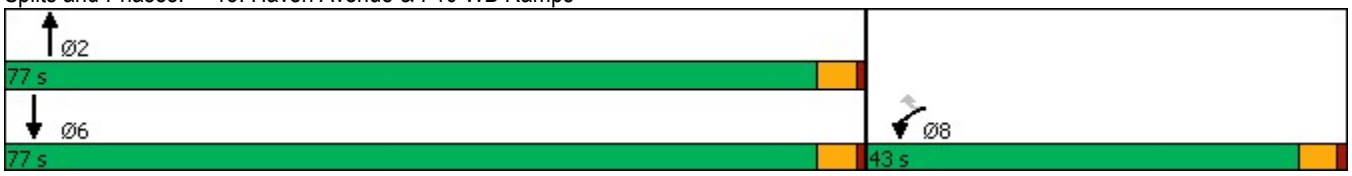
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	477	653	2518	0	0	1478
Future Volume (vph)	477	653	2518	0	0	1478
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	524	718	2767	0	0	1624
Shared Lane Traffic (%)		45%				
Lane Group Flow (vph)	847	395	2767	0	0	1624

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	477	653	2518	1478
Future Volume (vph)	477	653	2518	1478
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	43.0	43.0	77.0	77.0
Total Split (%)	35.8%	35.8%	64.2%	64.2%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	37.0	37.0	72.5	72.5
Actuated g/C Ratio	0.31	0.31	0.61	0.61
v/c Ratio	0.92	0.93	0.74	0.44
Control Delay	54.8	68.3	18.2	12.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	54.8	68.3	18.2	12.8
LOS	D	E	B	B
Approach Delay	59.1		18.2	12.8
Approach LOS	E		B	B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 118.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 25.7	Intersection LOS: C
Intersection Capacity Utilization 77.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps



Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	847	395	2767	1624
v/c Ratio	0.92	0.93	0.74	0.44
Control Delay	54.8	68.3	18.2	12.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	54.8	68.3	18.2	12.8
Queue Length 50th (ft)	320	318	425	185
Queue Length 95th (ft)	#434	#527	470	212
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	962	445	3715	3715
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.88	0.89	0.74	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

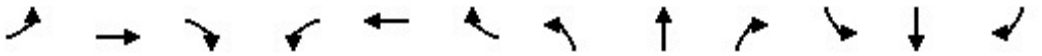
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	477	653	2518	0	0	1478
Future Volume (veh/h)	477	653	2518	0	0	1478
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1673	1772	1772	0	0	1772
Adj Flow Rate, veh/h	414	836	2767	0	0	1624
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	495	934	3711	0	0	3711
Arrive On Green	0.31	0.31	0.61	0.00	0.00	0.61
Sat Flow, veh/h	1594	3003	6592	0	0	6592
Grp Volume(v), veh/h	414	836	2767	0	0	1624
Grp Sat Flow(s),veh/h/ln	1594	1502	1524	0	0	1524
Q Serve(g_s), s	27.1	29.8	36.4	0.0	0.0	15.9
Cycle Q Clear(g_c), s	27.1	29.8	36.4	0.0	0.0	15.9
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	495	934	3711	0	0	3711
V/C Ratio(X)	0.84	0.90	0.75	0.00	0.00	0.44
Avail Cap(c_a), veh/h	548	1033	3947	0	0	3947
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	35.9	36.8	15.7	0.0	0.0	11.7
Incr Delay (d2), s/veh	10.0	9.6	0.8	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.8	12.0	12.0	0.0	0.0	5.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	45.9	46.5	16.4	0.0	0.0	11.8
LnGrp LOS	D	D	B	A	A	B
Approach Vol, veh/h	1250		2767			1624
Approach Delay, s/veh	46.3		16.4			11.8
Approach LOS	D		B			B

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		72.7			72.7	39.3
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		72.5			72.5	38.5
Max Q Clear Time (g_c+I1), s		38.4			17.9	31.8
Green Ext Time (p_c), s		29.7			19.7	3.0

Intersection Summary		
HCM 6th Ctrl Delay	21.7	
HCM 6th LOS	C	

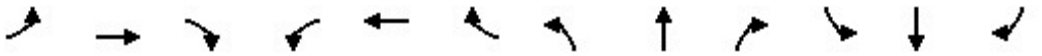
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			256			182			325			249
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



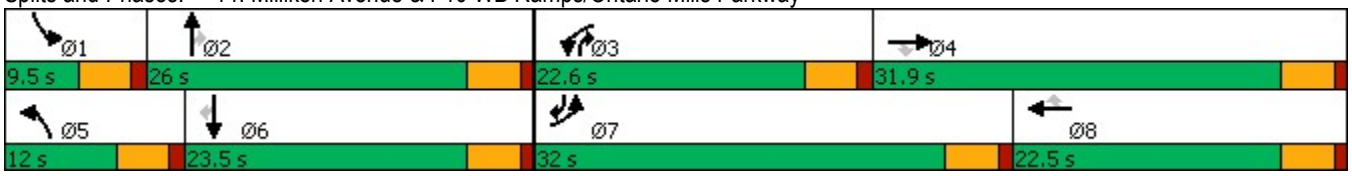
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	594	86	228	156	178	33	148	864	289	80	595	243
Future Volume (vph)	594	86	228	156	178	33	148	864	289	80	595	243
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	667	97	256	175	200	37	166	971	325	90	669	273
Shared Lane Traffic (%)												
Lane Group Flow (vph)	667	97	256	175	200	37	166	971	325	90	669	273

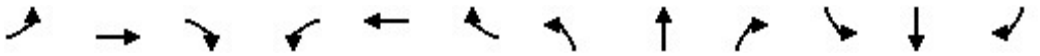
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	594	86	228	156	178	33	148	864	289	80	595	243
Future Volume (vph)	594	86	228	156	178	33	148	864	289	80	595	243
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	32.0	31.9	31.9	22.6	22.5	22.5	12.0	26.0	22.6	9.5	23.5	32.0
Total Split (%)	35.6%	35.4%	35.4%	25.1%	25.0%	25.0%	13.3%	28.9%	25.1%	10.6%	26.1%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	22.4	22.2	22.2	10.2	10.0	10.0	7.5	21.1	35.9	5.1	16.2	43.2
Actuated g/C Ratio	0.30	0.30	0.30	0.14	0.13	0.13	0.10	0.28	0.48	0.07	0.22	0.58
v/c Ratio	0.77	0.19	0.41	0.44	0.45	0.10	0.57	0.56	0.36	0.45	0.51	0.28
Control Delay	31.0	21.7	5.3	35.0	34.8	0.6	43.6	25.9	3.0	44.8	27.7	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.0	21.7	5.3	35.0	34.8	0.6	43.6	25.9	3.0	44.8	27.7	2.2
LOS	C	C	A	D	C	A	D	C	A	D	C	A
Approach Delay		23.6			31.8			22.8			22.5	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 74.5	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 23.9	Intersection LOS: C
Intersection Capacity Utilization 57.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway

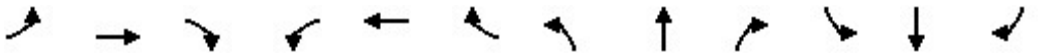




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	667	97	256	175	200	37	166	971	325	90	669	273
v/c Ratio	0.77	0.19	0.41	0.44	0.45	0.10	0.57	0.56	0.36	0.45	0.51	0.28
Control Delay	31.0	21.7	5.3	35.0	34.8	0.6	43.6	25.9	3.0	44.8	27.7	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.0	21.7	5.3	35.0	34.8	0.6	43.6	25.9	3.0	44.8	27.7	2.2
Queue Length 50th (ft)	150	34	0	41	47	0	40	118	0	22	80	4
Queue Length 95th (ft)	218	74	50	72	83	0	#83	167	40	#47	118	33
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	1093	664	724	719	829	508	298	1795	1023	198	1586	1071
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.15	0.35	0.24	0.24	0.07	0.56	0.54	0.32	0.45	0.42	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	594	86	228	156	178	33	148	864	289	80	595	243
Future Volume (veh/h)	594	86	228	156	178	33	148	864	289	80	595	243
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	667	97	256	175	200	37	166	971	325	90	669	273
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	809	513	435	266	347	155	243	1698	556	180	1568	804
Arrive On Green	0.28	0.29	0.29	0.09	0.10	0.10	0.08	0.28	0.28	0.06	0.26	0.26
Sat Flow, veh/h	2910	1772	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	667	97	256	175	200	37	166	971	325	90	669	273
Grp Sat Flow(s),veh/h/ln	1455	1772	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	13.9	2.7	9.4	3.8	3.7	1.5	3.6	8.8	11.3	1.9	5.9	6.7
Cycle Q Clear(g_c), s	13.9	2.7	9.4	3.8	3.7	1.5	3.6	8.8	11.3	1.9	5.9	6.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	809	513	435	266	347	155	243	1698	556	180	1568	804
V/C Ratio(X)	0.82	0.19	0.59	0.66	0.58	0.24	0.68	0.57	0.58	0.50	0.43	0.34
Avail Cap(c_a), veh/h	1238	751	636	815	937	418	338	2027	637	225	1791	859
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.9	17.3	19.7	28.4	27.6	26.7	28.8	20.0	16.4	29.4	20.0	8.5
Incr Delay (d2), s/veh	2.8	0.2	1.3	2.8	1.5	0.8	3.4	0.3	1.1	2.1	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	1.0	3.2	1.4	1.5	0.5	1.3	2.9	3.7	0.7	2.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.7	17.4	20.9	31.1	29.2	27.4	32.2	20.3	17.4	31.5	20.2	8.8
LnGrp LOS	C	B	C	C	C	C	C	C	B	C	C	A
Approach Vol, veh/h		1020			412			1462			1032	
Approach Delay, s/veh		23.0			29.8			21.0			18.2	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.5	22.5	10.4	23.2	9.9	21.1	22.5	11.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	21.5	18.1	27.4	7.5	19.0	27.5	18.0
Max Q Clear Time (g_c+I1), s	3.9	13.3	5.8	11.4	5.6	8.7	15.9	5.7
Green Ext Time (p_c), s	0.0	4.8	0.4	1.3	0.1	4.1	2.1	1.0

Intersection Summary	
HCM 6th Ctrl Delay	21.7
HCM 6th LOS	C

Notes

User approved changes to right turn type.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.993	0.850				
Flt Protected	0.954					
Satd. Flow (prot)	3063	1365	0	6071	6071	0
Flt Permitted	0.954					
Satd. Flow (perm)	3063	1365	0	6071	6071	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	4	4				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

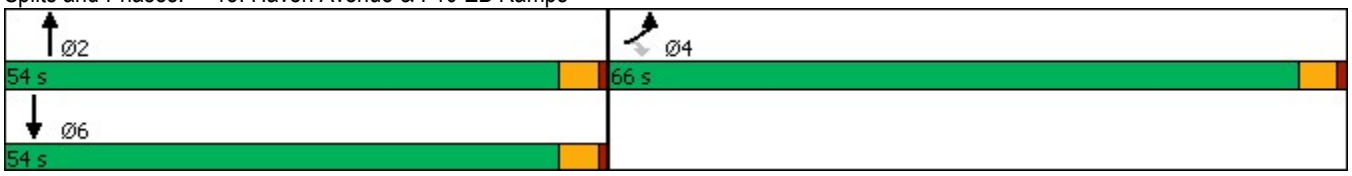
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	1205	560	0	1629	1467	0
Future Volume (vph)	1205	560	0	1629	1467	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1354	629	0	1830	1648	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	1417	566	0	1830	1648	0

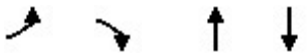
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1205	560	1629	1467
Future Volume (vph)	1205	560	1629	1467
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	66.0	66.0	54.0	54.0
Total Split (%)	55.0%	55.0%	45.0%	45.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	57.3	57.3	47.3	47.3
Actuated g/C Ratio	0.50	0.50	0.42	0.42
v/c Ratio	0.92	0.82	0.72	0.65
Control Delay	36.8	35.6	30.2	28.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	36.8	35.6	30.2	28.5
LOS	D	D	C	C
Approach Delay	36.5		30.2	28.5
Approach LOS	D		C	C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 113.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 32.0	Intersection LOS: C
Intersection Capacity Utilization 77.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1417	566	1830	1648
v/c Ratio	0.92	0.82	0.72	0.65
Control Delay	36.8	35.6	30.2	28.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	36.8	35.6	30.2	28.5
Queue Length 50th (ft)	494	384	341	294
Queue Length 95th (ft)	598	561	379	331
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	1676	748	2672	2672
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.85	0.76	0.68	0.62

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1205	560	0	1629	1467	0
Future Volume (veh/h)	1205	560	0	1629	1467	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1772	0	1772	1772	0
Adj Flow Rate, veh/h	1354	629	0	1830	1648	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	1567	738	0	2551	2551	0
Arrive On Green	0.49	0.49	0.00	0.42	0.42	0.00
Sat Flow, veh/h	3188	1502	0	6592	6592	0
Grp Volume(v), veh/h	1354	629	0	1830	1648	0
Grp Sat Flow(s),veh/h/ln	1594	1502	0	1524	1524	0
Q Serve(g_s), s	37.5	36.6	0.0	24.9	21.5	0.0
Cycle Q Clear(g_c), s	37.5	36.6	0.0	24.9	21.5	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	1567	738	0	2551	2551	0
V/C Ratio(X)	0.86	0.85	0.00	0.72	0.65	0.00
Avail Cap(c_a), veh/h	1961	924	0	3019	3019	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.5	22.2	0.0	24.2	23.2	0.0
Incr Delay (d2), s/veh	3.6	6.4	0.0	0.7	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.0	13.5	0.0	8.8	7.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.0	28.6	0.0	24.8	23.5	0.0
LnGrp LOS	C	C	A	C	C	A
Approach Vol, veh/h	1983			1830	1648	
Approach Delay, s/veh	26.9			24.8	23.5	
Approach LOS	C			C	C	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		46.3		53.6		46.3
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		49.5		61.5		49.5
Max Q Clear Time (g_c+I1), s		26.9		39.5		23.5
Green Ext Time (p_c), s		14.9		9.6		14.5

Intersection Summary		
HCM 6th Ctrl Delay		25.2
HCM 6th LOS		C

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1600	1800	1600	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2891	1500	2891	6071	6071	1500
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2891	1500	2891	6071	6071	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		8				323
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	629	564	153	676	709	281
Future Volume (vph)	629	564	153	676	709	281
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	723	648	176	777	815	323
Shared Lane Traffic (%)						
Lane Group Flow (vph)	723	648	176	777	815	323

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	629	564	153	676	709	281
Future Volume (vph)	629	564	153	676	709	281
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	38.0	27.0	27.0	52.0	25.0	38.0
Total Split (%)	42.2%	30.0%	30.0%	57.8%	27.8%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	22.5	38.8	11.5	32.7	16.4	43.7
Actuated g/C Ratio	0.35	0.60	0.18	0.51	0.25	0.68
v/c Ratio	0.72	0.72	0.34	0.25	0.53	0.29
Control Delay	23.7	14.4	27.2	9.8	23.7	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	14.4	27.2	9.8	23.7	1.4
LOS	C	B	C	A	C	A
Approach Delay	19.3			13.0	17.3	
Approach LOS	B			B	B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 64.7	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 16.9	Intersection LOS: B
Intersection Capacity Utilization 55.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

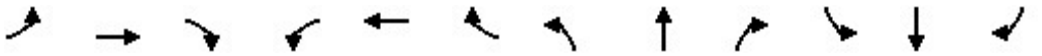
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	723	648	176	777	815	323
v/c Ratio	0.72	0.72	0.34	0.25	0.53	0.29
Control Delay	23.7	14.4	27.2	9.8	23.7	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	14.4	27.2	9.8	23.7	1.4
Queue Length 50th (ft)	120	154	31	46	77	0
Queue Length 95th (ft)	223	273	66	80	146	23
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	1581	1185	1062	4641	2032	1331
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.55	0.17	0.17	0.40	0.24

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	629	564	153	676	709	281
Future Volume (veh/h)	629	564	153	676	709	281
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1772	1575	1772	1772	1772
Adj Flow Rate, veh/h	723	648	176	777	815	323
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1308	816	274	2458	1436	1028
Arrive On Green	0.45	0.45	0.09	0.40	0.24	0.24
Sat Flow, veh/h	2910	1502	2910	6343	6343	1502
Grp Volume(v), veh/h	723	648	176	777	815	323
Grp Sat Flow(s),veh/h/ln	1455	1502	1455	1524	1524	1502
Q Serve(g_s), s	11.1	21.2	3.6	5.3	7.2	5.3
Cycle Q Clear(g_c), s	11.1	21.2	3.6	5.3	7.2	5.3
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1308	816	274	2458	1436	1028
V/C Ratio(X)	0.55	0.79	0.64	0.32	0.57	0.31
Avail Cap(c_a), veh/h	1595	965	1071	4738	2045	1179
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.3	11.2	26.7	12.5	20.6	3.9
Incr Delay (d2), s/veh	0.4	4.0	2.5	0.1	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.9	1.3	1.6	2.4	4.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.7	15.2	29.2	12.5	21.0	4.0
LnGrp LOS	B	B	C	B	C	A
Approach Vol, veh/h	1371			953	1138	
Approach Delay, s/veh	13.9			15.6	16.2	
Approach LOS	B			B	B	

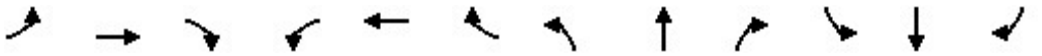
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		29.1		32.0	10.3	18.9
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		47.5		33.5	22.5	20.5
Max Q Clear Time (g_c+I1), s		7.3		23.2	5.6	9.2
Green Ext Time (p_c), s		6.4		4.3	0.5	5.2

Intersection Summary	
HCM 6th Ctrl Delay	15.1
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.965				0.850			0.850		0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4649	0	2891	3353	1500	2891	4818	1500	2891	5888	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4649	0	2891	3353	1500	2891	4818	1500	2891	5888	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		64				136			177		65	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	350	675	208	155	577	123	242	1468	186	170	1412	356
Future Volume (vph)	350	675	208	155	577	123	242	1468	186	170	1412	356
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	380	734	226	168	627	134	263	1596	202	185	1535	387
Shared Lane Traffic (%)												
Lane Group Flow (vph)	380	960	0	168	627	134	263	1596	202	185	1922	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	350	675	155	577	123	242	1468	186	170	1412
Future Volume (vph)	350	675	155	577	123	242	1468	186	170	1412
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	22.0	37.0	14.0	29.0	29.0	14.0	57.0		12.0	55.0
Total Split (%)	18.3%	30.8%	11.7%	24.2%	24.2%	11.7%	47.5%		10.0%	45.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	17.3	32.3	9.4	24.3	24.3	9.5	52.5	119.6	7.5	50.5
Actuated g/C Ratio	0.14	0.27	0.08	0.20	0.20	0.08	0.44	1.00	0.06	0.42
v/c Ratio	0.91	0.74	0.75	0.92	0.33	1.15	0.75	0.13	1.02	0.76
Control Delay	76.8	41.1	74.3	67.1	8.7	154.3	31.1	0.2	128.6	30.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.8	41.1	74.3	67.1	8.7	154.3	31.1	0.2	128.6	30.8
LOS	E	D	E	E	A	F	C	A	F	C
Approach Delay		51.2		59.9			43.8			39.4
Approach LOS		D		E			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.6	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay: 46.2	Intersection LOS: D
Intersection Capacity Utilization 79.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Haven Avenue & 4th Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	380	960	168	627	134	263	1596	202	185	1922
v/c Ratio	0.91	0.74	0.75	0.92	0.33	1.15	0.75	0.13	1.02	0.76
Control Delay	76.8	41.1	74.3	67.1	8.7	154.3	31.1	0.2	128.6	30.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.8	41.1	74.3	67.1	8.7	154.3	31.1	0.2	128.6	30.8
Queue Length 50th (ft)	151	232	66	252	0	~123	373	0	~78	352
Queue Length 95th (ft)	#240	285	#118	#361	51	#210	434	0	#155	399
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	422	1309	229	686	415	229	2114	1500	181	2523
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.73	0.73	0.91	0.32	1.15	0.75	0.13	1.02	0.76

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

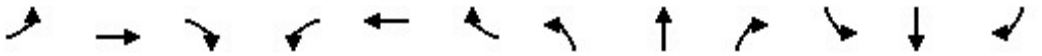
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	350	675	208	155	577	123	242	1468	186	170	1412	356
Future Volume (veh/h)	350	675	208	155	577	123	242	1468	186	170	1412	356
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	380	734	226	168	627	134	263	1596	0	185	1535	387
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	423	1007	306	214	681	304	231	2125		183	2065	521
Arrive On Green	0.15	0.27	0.27	0.07	0.20	0.20	0.08	0.44	0.00	0.06	0.42	0.42
Sat Flow, veh/h	2910	3677	1119	2910	3367	1502	2910	4837	1502	2910	4889	1233
Grp Volume(v), veh/h	380	643	317	168	627	134	263	1596	0	185	1435	487
Grp Sat Flow(s),veh/h/ln	1455	1612	1571	1455	1683	1502	1455	1612	1502	1455	1524	1550
Q Serve(g_s), s	15.3	21.6	22.0	6.8	21.8	9.3	9.5	33.0	0.0	7.5	31.6	31.6
Cycle Q Clear(g_c), s	15.3	21.6	22.0	6.8	21.8	9.3	9.5	33.0	0.0	7.5	31.6	31.6
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		0.80
Lane Grp Cap(c), veh/h	423	883	430	214	681	304	231	2125		183	1931	655
V/C Ratio(X)	0.90	0.73	0.74	0.79	0.92	0.44	1.14	0.75		1.01	0.74	0.74
Avail Cap(c_a), veh/h	426	883	430	231	690	308	231	2125		183	1931	655
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.2	39.3	39.5	54.4	46.8	41.8	55.0	28.1	0.0	56.0	29.1	29.1
Incr Delay (d2), s/veh	21.3	3.0	6.5	15.2	17.7	1.0	101.1	2.5	0.0	70.1	2.6	7.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	8.9	9.2	2.9	10.8	3.6	6.7	13.0	0.0	4.5	11.8	12.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.6	42.4	46.0	69.6	64.4	42.8	156.1	30.6	0.0	126.1	31.7	36.5
LnGrp LOS	E	D	D	E	E	D	F	C		F	C	D
Approach Vol, veh/h		1340			929			1859	A		2107	
Approach Delay, s/veh		51.5			62.3			48.3			41.1	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	57.0	13.3	37.2	14.0	55.0	21.9	28.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	52.5	9.5	32.5	9.5	50.5	17.5	24.5
Max Q Clear Time (g_c+I1), s	9.5	35.0	8.8	24.0	11.5	33.6	17.3	23.8
Green Ext Time (p_c), s	0.0	10.9	0.0	4.1	0.0	12.2	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	48.6
HCM 6th LOS	D

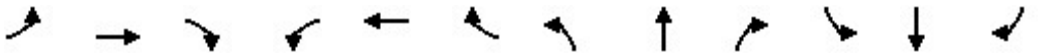
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.995				0.850			0.850		0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	6040	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	6040	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				127			202		186	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	4	1731	65	1	1069	14	63	0	9	45	0	12
Future Volume (vph)	4	1731	65	1	1069	14	63	0	9	45	0	12
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	4	1822	68	1	1125	15	66	0	9	47	0	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	1890	0	1	1125	15	66	0	9	47	13	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	4	1731	1	1069	14	63	9	45	0
Future Volume (vph)	4	1731	1	1069	14	63	9	45	0
Turn Type	Prot	NA	Prot	NA	Perm	Prot	Perm	Prot	NA
Protected Phases	7	4	3	8		5		1	6
Permitted Phases					8		2		
Detector Phase	7	4	3	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.5	42.4	9.5	42.4	42.4	11.8	23.7	14.4	26.3
Total Split (%)	10.6%	47.1%	10.6%	47.1%	47.1%	13.1%	26.3%	16.0%	29.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.3	35.3	5.3	35.3	35.3	7.1	5.8	7.5	6.4
Actuated g/C Ratio	0.09	0.60	0.09	0.60	0.60	0.12	0.10	0.13	0.11
v/c Ratio	0.03	0.52	0.01	0.39	0.02	0.35	0.03	0.23	0.03
Control Delay	31.5	8.8	31.0	8.0	0.0	34.1	0.1	30.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.5	8.8	31.0	8.0	0.0	34.1	0.1	30.4	0.1
LOS	C	A	C	A	A	C	A	C	A
Approach Delay		8.9		7.9					23.8
Approach LOS		A		A					C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 58.8	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 9.3	Intersection LOS: A
Intersection Capacity Utilization 47.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street

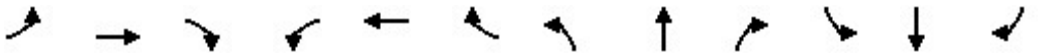
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	4	1890	1	1125	15	66	9	47	13
v/c Ratio	0.03	0.52	0.01	0.39	0.02	0.35	0.03	0.23	0.03
Control Delay	31.5	8.8	31.0	8.0	0.0	34.1	0.1	30.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.5	8.8	31.0	8.0	0.0	34.1	0.1	30.4	0.1
Queue Length 50th (ft)	2	112	0	75	0	24	0	17	0
Queue Length 95th (ft)	11	216	5	155	0	68	0	51	0
Internal Link Dist (ft)		2546		362					358
Turn Bay Length (ft)	130		130		145	165	165	50	
Base Capacity (vph)	142	4125	142	3288	1064	207	650	282	1231
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.46	0.01	0.34	0.01	0.32	0.01	0.17	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1731	65	1	1069	14	63	0	9	45	0	12
Future Volume (veh/h)	4	1731	65	1	1069	14	63	0	9	45	0	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	4	1822	68	1	1125	15	66	0	9	47	0	13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	9	3172	118	3	2506	778	92	181	154	74	153	137
Arrive On Green	0.01	0.52	0.52	0.00	0.52	0.52	0.06	0.00	0.10	0.05	0.00	0.09
Sat Flow, veh/h	1594	6076	227	1594	4837	1502	1594	1772	1502	1594	1683	1502
Grp Volume(v), veh/h	4	1371	519	1	1125	15	66	0	9	47	0	13
Grp Sat Flow(s),veh/h/ln	1594	1524	1731	1594	1612	1502	1594	1772	1502	1594	1683	1502
Q Serve(g_s), s	0.1	11.2	11.2	0.0	8.0	0.3	2.2	0.0	0.3	1.6	0.0	0.4
Cycle Q Clear(g_c), s	0.1	11.2	11.2	0.0	8.0	0.3	2.2	0.0	0.3	1.6	0.0	0.4
Prop In Lane	1.00		0.13	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	9	2387	904	3	2506	778	92	181	154	74	153	137
V/C Ratio(X)	0.47	0.57	0.57	0.34	0.45	0.02	0.72	0.00	0.06	0.63	0.00	0.10
Avail Cap(c_a), veh/h	145	3155	1195	145	3338	1036	212	619	525	287	668	596
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.2	9.0	9.0	27.4	8.3	6.4	25.4	0.0	22.3	25.7	0.0	22.9
Incr Delay (d2), s/veh	34.5	0.2	0.6	58.7	0.1	0.0	9.9	0.0	0.2	8.6	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	2.9	3.4	0.1	2.2	0.1	1.0	0.0	0.1	0.7	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.7	9.2	9.5	86.1	8.4	6.5	35.3	0.0	22.4	34.3	0.0	23.2
LnGrp LOS	E	A	A	F	A	A	D	A	C	C	A	C
Approach Vol, veh/h		1894			1141			75			60	
Approach Delay, s/veh		9.4			8.5			33.8			31.9	
Approach LOS		A			A			C			C	

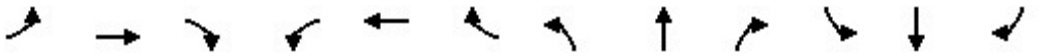
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	10.1	4.6	33.2	7.7	9.5	4.8	32.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.9	19.2	5.0	37.9	7.3	21.8	5.0	37.9
Max Q Clear Time (g_c+I1), s	3.6	2.3	2.0	13.2	4.2	2.4	2.1	10.0
Green Ext Time (p_c), s	0.0	0.0	0.0	15.4	0.0	0.0	0.0	9.5

Intersection Summary	
HCM 6th Ctrl Delay	10.1
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.995				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.953	
Satd. Flow (prot)	2891	6065	0	1583	4794	0	1583	1765	1500	0	1682	1500
Flt Permitted	0.950			0.950			0.728				0.731	
Satd. Flow (perm)	2891	6065	0	1583	4794	0	1213	1765	1500	0	1290	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			10				155			94
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



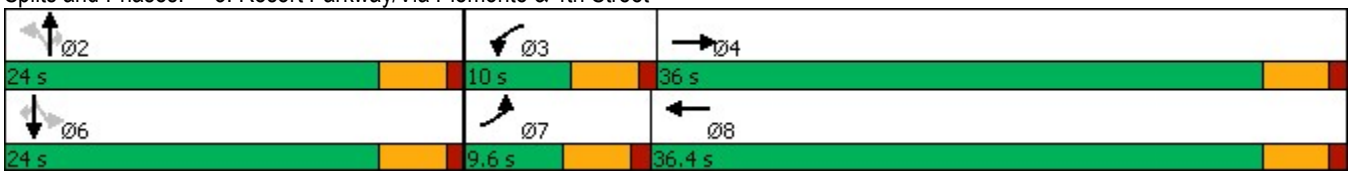
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	28	1747	8	65	1044	37	36	0	44	41	1	19
Future Volume (vph)	28	1747	8	65	1044	37	36	0	44	41	1	19
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	29	1839	8	68	1099	39	38	0	46	43	1	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	1847	0	68	1138	0	38	0	46	0	44	20

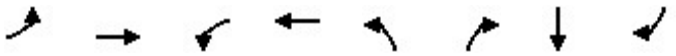
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	28	1747	65	1044	36	44	41	1	19
Future Volume (vph)	28	1747	65	1044	36	44	41	1	19
Turn Type	Prot	NA	Prot	NA	Perm	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8				6	
Permitted Phases					2	2	6		6
Detector Phase	7	4	3	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.6	36.0	10.0	36.4	24.0	24.0	24.0	24.0	24.0
Total Split (%)	13.7%	51.4%	14.3%	52.0%	34.3%	34.3%	34.3%	34.3%	34.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min
Act Effct Green (s)	5.3	29.9	5.7	31.9	7.4	7.4		7.4	7.4
Actuated g/C Ratio	0.10	0.58	0.11	0.61	0.14	0.14		0.14	0.14
v/c Ratio	0.10	0.53	0.39	0.39	0.22	0.13		0.24	0.07
Control Delay	25.9	8.3	32.9	6.4	25.5	0.8		25.7	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	25.9	8.3	32.9	6.4	25.5	0.8		25.7	0.4
LOS	C	A	C	A	C	A		C	A
Approach Delay		8.6		7.9				17.8	
Approach LOS		A		A				B	

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 52	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 8.6	Intersection LOS: A
Intersection Capacity Utilization 51.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street





Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBT	SBR
Lane Group Flow (vph)	29	1847	68	1138	38	46	44	20
v/c Ratio	0.10	0.53	0.39	0.39	0.22	0.13	0.24	0.07
Control Delay	25.9	8.3	32.9	6.4	25.5	0.8	25.7	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.9	8.3	32.9	6.4	25.5	0.8	25.7	0.4
Queue Length 50th (ft)	5	108	23	38	12	0	14	0
Queue Length 95th (ft)	15	154	#66	113	35	0	39	0
Internal Link Dist (ft)		362		428			378	
Turn Bay Length (ft)	220		125		115	115		110
Base Capacity (vph)	294	3814	173	3216	472	678	501	641
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.48	0.39	0.35	0.08	0.07	0.09	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	1747	8	65	1044	37	36	0	44	41	1	19
Future Volume (veh/h)	28	1747	8	65	1044	37	36	0	44	41	1	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	29	1839	8	68	1099	39	38	0	46	43	1	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	98	3348	15	101	2687	95	264	194	165	302	5	165
Arrive On Green	0.03	0.53	0.53	0.06	0.56	0.56	0.11	0.00	0.11	0.11	0.11	0.11
Sat Flow, veh/h	2910	6311	27	1594	4796	170	1314	1772	1502	1324	47	1502
Grp Volume(v), veh/h	29	1332	515	68	739	399	38	0	46	44	0	20
Grp Sat Flow(s),veh/h/ln	1455	1524	1767	1594	1612	1741	1314	1772	1502	1371	0	1502
Q Serve(g_s), s	0.4	8.8	8.8	1.9	6.0	6.0	1.2	0.0	1.3	1.3	0.0	0.5
Cycle Q Clear(g_c), s	0.4	8.8	8.8	1.9	6.0	6.0	2.6	0.0	1.3	1.3	0.0	0.5
Prop In Lane	1.00		0.02	1.00		0.10	1.00		1.00	0.98		1.00
Lane Grp Cap(c), veh/h	98	2425	937	101	1806	975	264	194	165	307	0	165
V/C Ratio(X)	0.30	0.55	0.55	0.67	0.41	0.41	0.14	0.00	0.28	0.14	0.00	0.12
Avail Cap(c_a), veh/h	326	3161	1222	192	2258	1219	682	759	643	742	0	643
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.5	7.1	7.1	20.9	5.7	5.7	19.8	0.0	18.6	18.6	0.0	18.3
Incr Delay (d2), s/veh	1.7	0.2	0.5	7.6	0.1	0.3	0.2	0.0	0.9	0.2	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.0	2.3	0.8	1.3	1.5	0.4	0.0	0.4	0.4	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.1	7.3	7.6	28.4	5.9	6.0	20.1	0.0	19.5	18.9	0.0	18.6
LnGrp LOS	C	A	A	C	A	A	C	A	B	B	A	B
Approach Vol, veh/h		1876			1206			84			64	
Approach Delay, s/veh		7.6			7.2			19.8			18.8	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	7.4	28.7		9.5	6.0	30.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		19.5	5.5	31.5		19.5	5.1	31.9				
Max Q Clear Time (g_c+I1), s		4.6	3.9	10.8		3.3	2.4	8.0				
Green Ext Time (p_c), s		0.2	0.0	13.4		0.2	0.0	8.5				

Intersection Summary	
HCM 6th Ctrl Delay	8.0
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.995					0.865
Flt Protected						
Satd. Flow (prot)	4794	0	0	4818	0	1526
Flt Permitted						
Satd. Flow (perm)	4794	0	0	4818	0	1526
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	1779	61	0	1120	0	51
Future Volume (vph)	1779	61	0	1120	0	51
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1853	64	0	1167	0	53
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1917	0	0	1167	0	53

Intersection Summary

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1779	61	0	1120	0	51
Future Vol, veh/h	1779	61	0	1120	0	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1853	64	0	1167	0	53

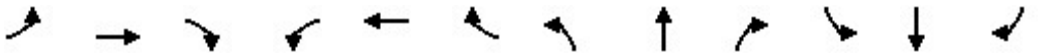
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	959
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	221
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	221
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	26.4
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	221	-	-	-
HCM Lane V/C Ratio	0.24	-	-	-
HCM Control Delay (s)	26.4	-	-	-
HCM Lane LOS	D	-	-	-
HCM 95th %tile Q(veh)	0.9	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.980	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5949	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5949	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			179			275			55		31	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



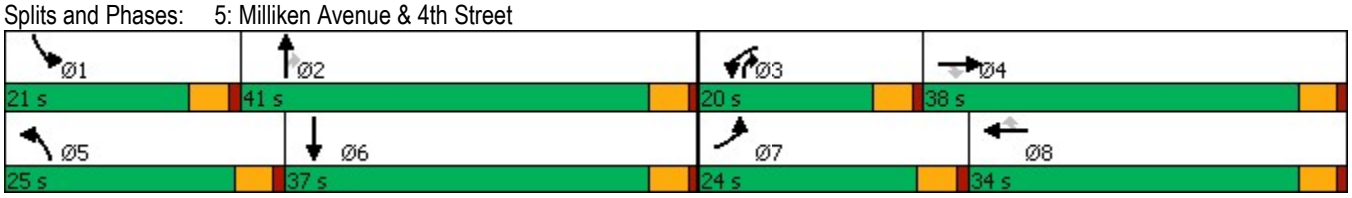
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	419	1079	198	369	873	264	290	1455	363	415	914	138
Future Volume (vph)	419	1079	198	369	873	264	290	1455	363	415	914	138
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	436	1124	206	384	909	275	302	1516	378	432	952	144
Shared Lane Traffic (%)												
Lane Group Flow (vph)	436	1124	206	384	909	275	302	1516	378	432	1096	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	419	1079	198	369	873	264	290	1455	363	415	914
Future Volume (vph)	419	1079	198	369	873	264	290	1455	363	415	914
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	24.0	38.0	38.0	20.0	34.0	34.0	25.0	41.0	20.0	21.0	37.0
Total Split (%)	20.0%	31.7%	31.7%	16.7%	28.3%	28.3%	20.8%	34.2%	16.7%	17.5%	30.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	19.4	32.7	32.7	15.5	28.8	28.8	17.2	36.1	56.1	16.5	35.4
Actuated g/C Ratio	0.16	0.28	0.28	0.13	0.24	0.24	0.14	0.30	0.47	0.14	0.30
v/c Ratio	0.93	0.85	0.38	1.02	0.78	0.48	0.72	0.82	0.51	1.08	0.61
Control Delay	76.2	47.9	9.3	102.6	47.5	7.3	58.9	42.9	21.4	115.4	37.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.2	47.9	9.3	102.6	47.5	7.3	58.9	42.9	21.4	115.4	37.0
LOS	E	D	A	F	D	A	E	D	C	F	D
Approach Delay		50.4			53.9			41.4			59.2
Approach LOS		D			D			D			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 118.8	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 50.3	Intersection LOS: D
Intersection Capacity Utilization 85.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 5: Milliken Avenue & 4th Street

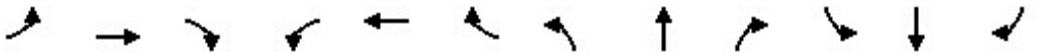


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	436	1124	206	384	909	275	302	1516	378	432	1096
v/c Ratio	0.93	0.85	0.38	1.02	0.78	0.48	0.72	0.82	0.51	1.08	0.61
Control Delay	76.2	47.9	9.3	102.6	47.5	7.3	58.9	42.9	21.4	115.4	37.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.2	47.9	9.3	102.6	47.5	7.3	58.9	42.9	21.4	115.4	37.0
Queue Length 50th (ft)	173	300	15	~163	240	0	116	315	169	~193	206
Queue Length 95th (ft)	#271	357	77	#264	293	69	161	363	261	#297	254
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	474	1359	551	377	1196	579	498	1865	737	401	1796
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.83	0.37	1.02	0.76	0.47	0.61	0.81	0.51	1.08	0.61

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

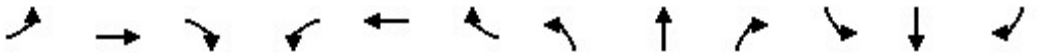
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	419	1079	198	369	873	264	290	1455	363	415	914	138
Future Volume (veh/h)	419	1079	198	369	873	264	290	1455	363	415	914	138
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	436	1124	206	384	909	275	302	1516	378	432	952	144
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	480	1309	406	388	1155	359	360	1827	650	413	1714	256
Arrive On Green	0.16	0.27	0.27	0.13	0.24	0.24	0.12	0.30	0.30	0.14	0.32	0.32
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	2910	6095	1502	2910	5394	805
Grp Volume(v), veh/h	436	1124	206	384	909	275	302	1516	378	432	805	291
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1455	1524	1502	1455	1524	1627
Q Serve(g_s), s	17.1	25.7	13.5	15.3	20.5	19.9	11.8	27.0	22.2	16.5	17.0	17.3
Cycle Q Clear(g_c), s	17.1	25.7	13.5	15.3	20.5	19.9	11.8	27.0	22.2	16.5	17.0	17.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.49
Lane Grp Cap(c), veh/h	480	1309	406	388	1155	359	360	1827	650	413	1453	517
V/C Ratio(X)	0.91	0.86	0.51	0.99	0.79	0.77	0.84	0.83	0.58	1.05	0.55	0.56
Avail Cap(c_a), veh/h	488	1392	432	388	1226	381	513	1912	671	413	1453	517
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.7	40.3	35.9	50.4	41.5	41.3	49.9	38.0	25.0	49.9	32.9	33.0
Incr Delay (d2), s/veh	20.6	5.4	1.0	43.2	3.3	8.6	8.3	3.1	1.2	57.2	0.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	10.7	5.0	7.9	8.5	8.2	4.7	10.4	8.0	9.2	6.3	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.3	45.7	36.9	93.5	44.8	49.9	58.2	41.1	26.2	107.1	33.3	34.4
LnGrp LOS	E	D	D	F	D	D	E	D	C	F	C	C
Approach Vol, veh/h		1766			1568			2196			1528	
Approach Delay, s/veh		50.3			57.6			40.9			54.4	
Approach LOS		D			E			D			D	

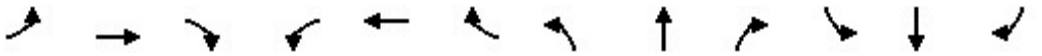
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	39.4	20.0	36.0	18.9	41.5	23.7	32.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	36.5	15.5	33.5	20.5	32.5	19.5	29.5
Max Q Clear Time (g_c+I1), s	18.5	29.0	17.3	27.7	13.8	19.3	19.1	22.5
Green Ext Time (p_c), s	0.0	5.9	0.0	3.8	0.6	6.1	0.1	3.9

Intersection Summary	
HCM 6th Ctrl Delay	49.9
HCM 6th LOS	D



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.925	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2971	1365
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2971	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			125			186			276		199	328
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



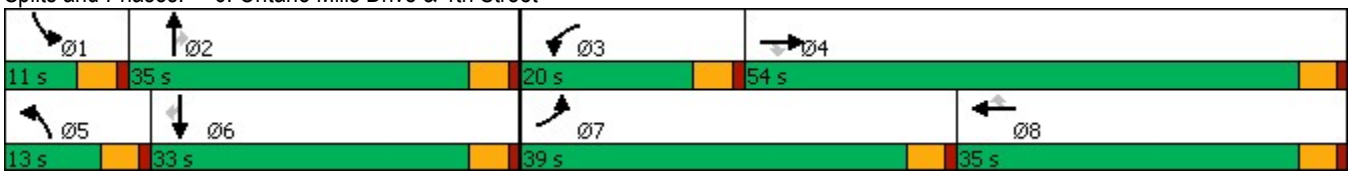
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	919	1216	115	217	954	300	136	298	338	75	300	604
Future Volume (vph)	919	1216	115	217	954	300	136	298	338	75	300	604
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	999	1322	125	236	1037	326	148	324	367	82	326	657
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	999	1322	125	236	1037	326	148	324	367	82	655	328

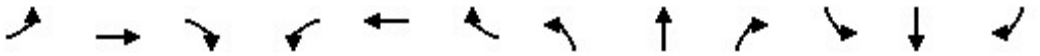
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	919	1216	115	217	954	300	136	298	338	75	300	604
Future Volume (vph)	919	1216	115	217	954	300	136	298	338	75	300	604
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	39.0	54.0	54.0	20.0	35.0	35.0	13.0	35.0	35.0	11.0	33.0	33.0
Total Split (%)	32.5%	45.0%	45.0%	16.7%	29.2%	29.2%	10.8%	29.2%	29.2%	9.2%	27.5%	27.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	34.6	50.7	50.7	13.7	29.9	29.9	8.5	27.1	27.1	6.5	25.1	25.1
Actuated g/C Ratio	0.30	0.44	0.44	0.12	0.26	0.26	0.07	0.23	0.23	0.06	0.22	0.22
v/c Ratio	1.16	0.63	0.17	0.69	0.84	0.62	1.28	0.41	0.65	0.93	0.82	0.59
Control Delay	122.7	27.8	4.4	60.7	48.3	22.1	218.8	39.4	16.4	133.8	39.2	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	122.7	27.8	4.4	60.7	48.3	22.1	218.8	39.4	16.4	133.8	39.2	8.9
LOS	F	C	A	E	D	C	F	D	B	F	D	A
Approach Delay		65.4			44.8			61.0			37.2	
Approach LOS		E			D			E			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 116.1	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.28	
Intersection Signal Delay: 54.2	Intersection LOS: D
Intersection Capacity Utilization 89.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 6: Ontario Mills Drive & 4th Street



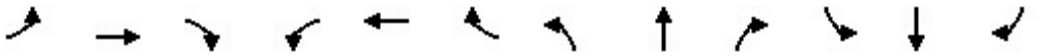


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	999	1322	125	236	1037	326	148	324	367	82	655	328
v/c Ratio	1.16	0.63	0.17	0.69	0.84	0.62	1.28	0.41	0.65	0.93	0.82	0.59
Control Delay	122.7	27.8	4.4	60.7	48.3	22.1	218.8	39.4	16.4	133.8	39.2	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	122.7	27.8	4.4	60.7	48.3	22.1	218.8	39.4	16.4	133.8	39.2	8.9
Queue Length 50th (ft)	~481	294	0	90	279	93	~147	109	56	64	185	0
Queue Length 95th (ft)	#614	352	37	134	337	197	#284	153	163	#169	260	87
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	861	2104	725	386	1268	531	116	883	598	88	881	583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.16	0.63	0.17	0.61	0.82	0.61	1.28	0.37	0.61	0.93	0.74	0.56

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



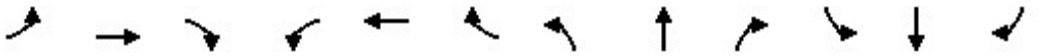
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	919	1216	115	217	954	300	136	298	338	75	300	604
Future Volume (veh/h)	919	1216	115	217	954	300	136	298	338	75	300	604
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	999	1322	125	236	1037	326	148	324	367	82	326	657
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	845	2121	658	287	1195	371	114	864	385	87	425	720
Arrive On Green	0.29	0.44	0.44	0.10	0.25	0.25	0.07	0.26	0.26	0.05	0.24	0.24
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	1594	3367	1502	1594	1772	3003
Grp Volume(v), veh/h	999	1322	125	236	1037	326	148	324	367	82	326	657
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1594	1683	1502	1594	1772	1502
Q Serve(g_s), s	34.5	25.1	6.1	9.5	24.4	24.8	8.5	9.4	28.6	6.1	20.4	25.3
Cycle Q Clear(g_c), s	34.5	25.1	6.1	9.5	24.4	24.8	8.5	9.4	28.6	6.1	20.4	25.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	845	2121	658	287	1195	371	114	864	385	87	425	720
V/C Ratio(X)	1.18	0.62	0.19	0.82	0.87	0.88	1.30	0.38	0.95	0.94	0.77	0.91
Avail Cap(c_a), veh/h	845	2121	658	379	1241	385	114	864	385	87	425	720
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.2	25.8	20.4	52.5	42.9	43.0	55.2	36.3	43.5	56.0	42.1	44.0
Incr Delay (d2), s/veh	94.3	0.6	0.1	10.4	6.6	19.6	184.4	0.3	33.7	76.8	8.2	16.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	23.3	9.6	2.2	3.9	10.4	11.2	9.2	3.9	14.1	4.3	9.8	10.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	136.5	26.4	20.6	62.9	49.5	62.7	239.6	36.6	77.1	132.7	50.3	60.0
LnGrp LOS	F	C	C	E	D	E	F	D	E	F	D	E
Approach Vol, veh/h		2446			1599			839			1065	
Approach Delay, s/veh		71.0			54.2			90.1			62.6	
Approach LOS		E			D			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	35.0	16.2	56.6	13.0	33.0	39.0	33.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	30.5	15.5	49.5	8.5	28.5	34.5	30.5
Max Q Clear Time (g_c+I1), s	8.1	30.6	11.5	27.1	10.5	27.3	36.5	26.8
Green Ext Time (p_c), s	0.0	0.0	0.3	10.9	0.0	0.6	0.0	2.5

Intersection Summary	
HCM 6th Ctrl Delay	67.7
HCM 6th LOS	E

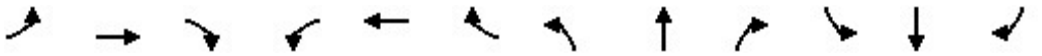
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.973			0.936				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.982	
Satd. Flow (prot)	2891	4818	1500	1583	4688	0	1583	3138	0	1504	1646	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.982	
Satd. Flow (perm)	2891	4818	1500	1583	4688	0	1583	3138	0	1504	1646	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			97		38			58				310
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



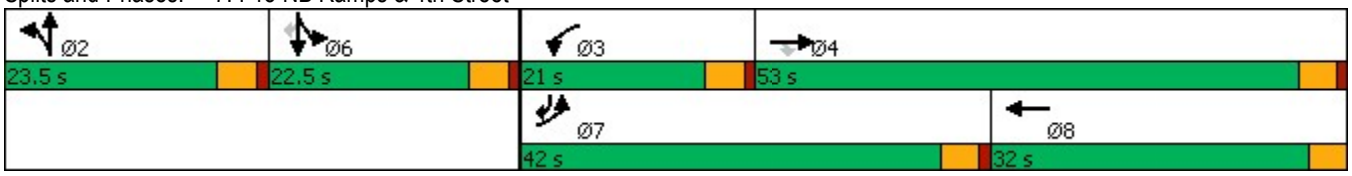
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	829	698	93	76	743	164	114	74	56	138	65	601
Future Volume (vph)	829	698	93	76	743	164	114	74	56	138	65	601
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	864	727	97	79	774	171	119	77	58	144	68	626
Shared Lane Traffic (%)										28%		
Lane Group Flow (vph)	864	727	97	79	945	0	119	135	0	104	108	626

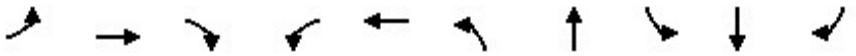
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	829	698	93	76	743	114	74	138	65	601
Future Volume (vph)	829	698	93	76	743	114	74	138	65	601
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	42.0	53.0	53.0	21.0	32.0	23.5	23.5	22.5	22.5	42.0
Total Split (%)	35.0%	44.2%	44.2%	17.5%	26.7%	19.6%	19.6%	18.8%	18.8%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	36.2	53.5	53.5	10.7	26.3	13.2	13.2	12.5	12.5	53.3
Actuated g/C Ratio	0.34	0.51	0.51	0.10	0.25	0.13	0.13	0.12	0.12	0.51
v/c Ratio	0.87	0.30	0.12	0.49	0.79	0.60	0.30	0.58	0.55	0.42
Control Delay	45.0	17.9	4.6	58.0	42.1	58.7	27.6	59.6	57.0	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.0	17.9	4.6	58.0	42.1	58.7	27.6	59.6	57.0	9.0
LOS	D	B	A	E	D	E	C	E	E	A
Approach Delay		31.0			43.3		42.2		21.5	
Approach LOS		C			D		D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 105.5	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 33.0	Intersection LOS: C
Intersection Capacity Utilization 74.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street

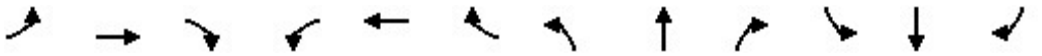




Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	864	727	97	79	945	119	135	104	108	626
v/c Ratio	0.87	0.30	0.12	0.49	0.79	0.60	0.30	0.58	0.55	0.42
Control Delay	45.0	17.9	4.6	58.0	42.1	58.7	27.6	59.6	57.0	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.0	17.9	4.6	58.0	42.1	58.7	27.6	59.6	57.0	9.0
Queue Length 50th (ft)	290	106	0	53	215	80	25	73	76	69
Queue Length 95th (ft)	#469	176	33	107	301	147	57	140	143	126
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	1045	2441	808	251	1316	290	622	260	285	1530
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.30	0.12	0.31	0.72	0.41	0.22	0.40	0.38	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	829	698	93	76	743	164	114	74	56	138	65	601
Future Volume (veh/h)	829	698	93	76	743	164	114	74	56	138	65	601
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	864	727	97	79	774	171	119	77	58	106	121	626
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	942	2426	753	99	952	209	158	189	130	260	289	1462
Arrive On Green	0.32	0.50	0.50	0.06	0.24	0.24	0.10	0.10	0.10	0.16	0.16	0.16
Sat Flow, veh/h	2910	4837	1502	1594	3971	869	1594	1908	1312	1594	1772	3003
Grp Volume(v), veh/h	864	727	97	79	627	318	119	67	68	106	121	626
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1594	1612	1615	1594	1683	1536	1594	1772	1502
Q Serve(g_s), s	29.5	9.1	3.6	5.0	18.9	19.2	7.5	3.9	4.3	6.2	6.3	14.0
Cycle Q Clear(g_c), s	29.5	9.1	3.6	5.0	18.9	19.2	7.5	3.9	4.3	6.2	6.3	14.0
Prop In Lane	1.00		1.00	1.00		0.54	1.00		0.85	1.00		1.00
Lane Grp Cap(c), veh/h	942	2426	753	99	774	387	158	167	152	260	289	1462
V/C Ratio(X)	0.92	0.30	0.13	0.80	0.81	0.82	0.75	0.40	0.45	0.41	0.42	0.43
Avail Cap(c_a), veh/h	1057	2426	753	255	890	446	293	310	283	278	309	1496
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.6	15.1	13.7	47.8	37.0	37.1	45.3	43.6	43.8	38.7	38.8	17.2
Incr Delay (d2), s/veh	11.5	0.1	0.1	13.6	5.1	10.3	7.1	1.6	2.0	1.0	1.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.7	3.3	1.2	2.4	7.9	8.6	3.3	1.7	1.7	2.5	2.8	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.1	15.2	13.8	61.3	42.1	47.4	52.4	45.2	45.9	39.8	39.8	17.4
LnGrp LOS	D	B	B	E	D	D	D	D	D	D	D	B
Approach Vol, veh/h		1688			1024			254			853	
Approach Delay, s/veh		30.4			45.2			48.7			23.3	
Approach LOS		C			D			D			C	

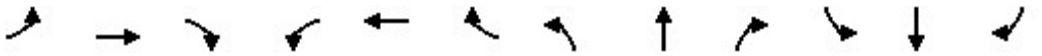
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		14.7	10.9	56.3		21.3	37.9	29.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		19.0	16.5	48.5		18.0	37.5	* 29				
Max Q Clear Time (g_c+I1), s		9.5	7.0	11.1		16.0	31.5	21.2				
Green Ext Time (p_c), s		0.7	0.1	6.3		0.9	1.9	3.5				

Intersection Summary	
HCM 6th Ctrl Delay	34.0
HCM 6th LOS	C

Notes

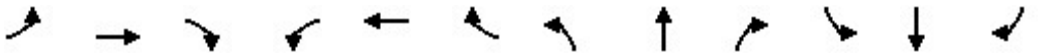
User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.907				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3041	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3041	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		63				149			149			149
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



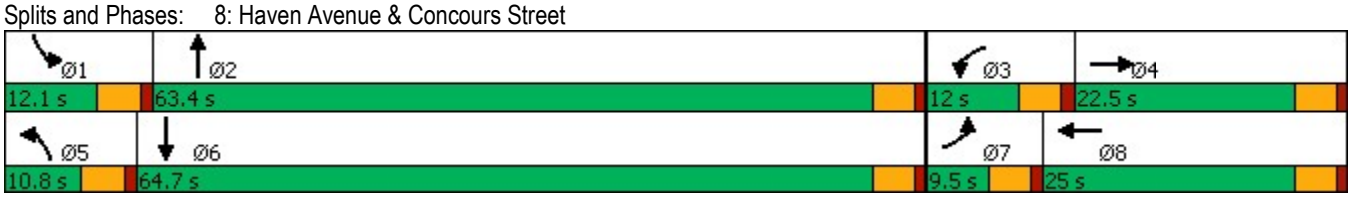
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	25	38	62	171	91	93	46	2275	206	42	1870	27
Future Volume (vph)	25	38	62	171	91	93	46	2275	206	42	1870	27
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	26	39	63	174	93	95	47	2321	210	43	1908	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	102	0	174	93	95	47	2321	210	43	1908	28

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	25	38	171	91	93	46	2275	206	42	1870	27
Future Volume (vph)	25	38	171	91	93	46	2275	206	42	1870	27
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	12.0	25.0		10.8	63.4		12.1	64.7	
Total Split (%)	8.6%	20.5%	10.9%	22.7%		9.8%	57.6%		11.0%	58.8%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.1	6.9	7.5	13.0	90.9	6.2	58.8	90.9	6.7	59.3	90.9
Actuated g/C Ratio	0.06	0.08	0.08	0.14	1.00	0.07	0.65	1.00	0.07	0.65	1.00
v/c Ratio	0.16	0.35	0.53	0.19	0.06	0.24	0.59	0.14	0.20	0.48	0.02
Control Delay	47.6	23.6	49.1	38.6	0.1	47.1	11.6	0.2	45.3	9.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.6	23.6	49.1	38.6	0.1	47.1	11.6	0.2	45.3	9.8	0.0
LOS	D	C	D	D	A	D	B	A	D	A	A
Approach Delay		28.5		33.5			11.3			10.4	
Approach LOS		C		C			B			B	

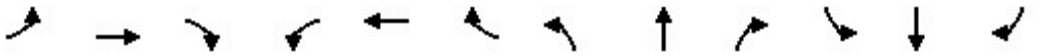
Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 90.9	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 13.0	Intersection LOS: B
Intersection Capacity Utilization 53.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	26	102	174	93	95	47	2321	210	43	1908	28
v/c Ratio	0.16	0.35	0.53	0.19	0.06	0.24	0.59	0.14	0.20	0.48	0.02
Control Delay	47.6	23.6	49.1	38.6	0.1	47.1	11.6	0.2	45.3	9.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.6	23.6	49.1	38.6	0.1	47.1	11.6	0.2	45.3	9.8	0.0
Queue Length 50th (ft)	8	12	37	25	0	14	251	0	13	182	0
Queue Length 95th (ft)	22	38	63	54	0	34	315	0	30	227	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	161	662	330	769	1500	203	4003	1500	246	4091	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.15	0.53	0.12	0.06	0.23	0.58	0.14	0.17	0.47	0.02

Intersection Summary



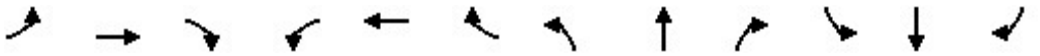
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	38	62	171	91	93	46	2275	206	42	1870	27
Future Volume (veh/h)	25	38	62	171	91	93	46	2275	206	42	1870	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	26	39	63	174	93	0	47	2321	0	43	1908	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	79	117	104	267	368		117	3679		111	3667	
Arrive On Green	0.03	0.07	0.07	0.07	0.11	0.00	0.04	0.60	0.00	0.04	0.60	0.00
Sat Flow, veh/h	2910	1683	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	26	39	63	174	93	0	47	2321	0	43	1908	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	0.7	1.8	3.3	3.5	2.1	0.0	1.3	19.8	0.0	1.2	14.8	0.0
Cycle Q Clear(g_c), s	0.7	1.8	3.3	3.5	2.1	0.0	1.3	19.8	0.0	1.2	14.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	79	117	104	267	368		117	3679		111	3667	
V/C Ratio(X)	0.33	0.33	0.61	0.65	0.25		0.40	0.63		0.39	0.52	
Avail Cap(c_a), veh/h	179	373	333	366	849		226	4419		272	4516	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.8	36.0	36.7	37.0	33.1	0.0	38.0	10.3	0.0	38.1	9.4	0.0
Incr Delay (d2), s/veh	2.4	1.7	5.6	2.7	0.4	0.0	2.2	0.2	0.0	2.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.8	1.4	1.2	0.8	0.0	0.5	5.7	0.0	0.4	4.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.1	37.7	42.3	39.6	33.5	0.0	40.2	10.5	0.0	40.3	9.5	0.0
LnGrp LOS	D	D	D	D	C		D	B		D	A	
Approach Vol, veh/h		128			267	A		2368	A		1951	A
Approach Delay, s/veh		40.7			37.5			11.1			10.2	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.6	53.5	10.0	10.1	7.8	53.4	6.7	13.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.6	58.9	7.5	18.0	6.3	60.2	5.0	20.5
Max Q Clear Time (g_c+I1), s	3.2	21.8	5.5	5.3	3.3	16.8	2.7	4.1
Green Ext Time (p_c), s	0.0	27.2	0.1	0.4	0.0	23.4	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	13.0
HCM 6th LOS	B

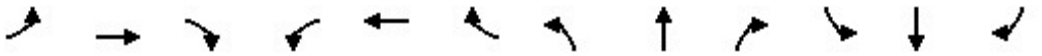
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.979			0.949						0.980	
Flt Protected	0.950	0.959			0.970		0.950			0.950		
Satd. Flow (prot)	1593	1574	0	0	1624	0	1676	4818	0	1676	4721	0
Flt Permitted	0.950	0.959					0.950			0.950		
Satd. Flow (perm)	1593	1574	0	0	1675	0	1676	4818	0	1676	4721	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		95			95						34	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



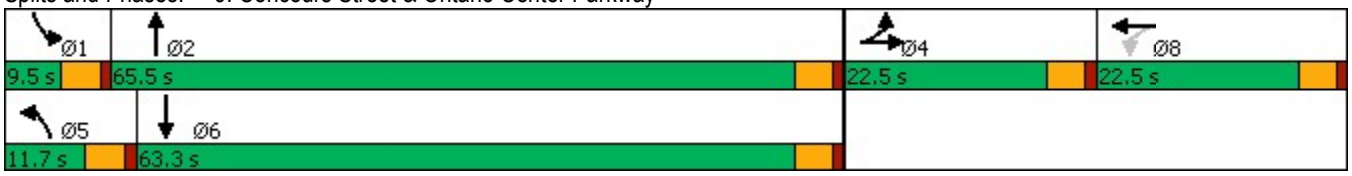
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	168	0	12	14	0	9	34	1731	5	1	1044	163
Future Volume (vph)	168	0	12	14	0	9	34	1731	5	1	1044	163
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	177	0	13	15	0	9	36	1822	5	1	1099	172
Shared Lane Traffic (%)	46%											
Lane Group Flow (vph)	96	94	0	0	24	0	36	1827	0	1	1271	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	168	0	14	0	34	1731	1	1044
Future Volume (vph)	168	0	14	0	34	1731	1	1044
Turn Type	Split	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	4	4		8	5	2	1	6
Permitted Phases			8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	11.7	65.5	9.5	63.3
Total Split (%)	18.8%	18.8%	18.8%	18.8%	9.8%	54.6%	7.9%	52.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	10.8	10.8		5.8	6.9	49.9	5.3	44.9
Actuated g/C Ratio	0.14	0.14		0.08	0.09	0.67	0.07	0.60
v/c Ratio	0.42	0.30		0.11	0.23	0.57	0.01	0.45
Control Delay	39.3	11.4		1.0	42.7	9.1	44.0	10.5
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	39.3	11.4		1.0	42.7	9.1	44.0	10.5
LOS	D	B		A	D	A	D	B
Approach Delay		25.5		1.0		9.7		10.5
Approach LOS		C		A		A		B

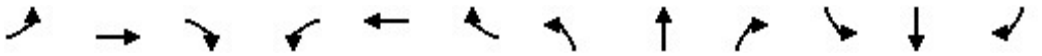
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 74.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 10.9	Intersection LOS: B
Intersection Capacity Utilization 51.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	96	94	24	36	1827	1	1271
v/c Ratio	0.42	0.30	0.11	0.23	0.57	0.01	0.45
Control Delay	39.3	11.4	1.0	42.7	9.1	44.0	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.3	11.4	1.0	42.7	9.1	44.0	10.5
Queue Length 50th (ft)	37	0	0	14	102	0	108
Queue Length 95th (ft)	116	46	0	57	339	7	212
Internal Link Dist (ft)		319	68		111		176
Turn Bay Length (ft)	170			115		120	
Base Capacity (vph)	406	472	497	170	4047	118	3896
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.20	0.05	0.21	0.45	0.01	0.33

Intersection Summary



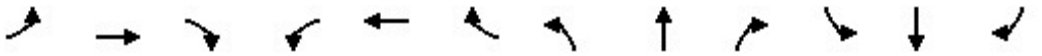
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	168	0	12	14	0	9	34	1731	5	1	1044	163
Future Volume (veh/h)	168	0	12	14	0	9	34	1731	5	1	1044	163
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	189	0	0	15	0	9	36	1822	5	1	1099	172
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	303	159	0	27	0	16	63	2965	8	3	2360	369
Arrive On Green	0.09	0.00	0.00	0.03	0.00	0.03	0.04	0.60	0.60	0.00	0.56	0.56
Sat Flow, veh/h	3375	1772	0	1008	0	605	1688	4981	14	1688	4218	660
Grp Volume(v), veh/h	189	0	0	24	0	0	36	1180	647	1	840	431
Grp Sat Flow(s),veh/h/ln	1688	1772	0	1613	0	0	1688	1612	1769	1688	1612	1653
Q Serve(g_s), s	3.4	0.0	0.0	0.9	0.0	0.0	1.3	14.7	14.7	0.0	9.8	9.8
Cycle Q Clear(g_c), s	3.4	0.0	0.0	0.9	0.0	0.0	1.3	14.7	14.7	0.0	9.8	9.8
Prop In Lane	1.00		0.00	0.62		0.37	1.00		0.01	1.00		0.40
Lane Grp Cap(c), veh/h	303	159	0	44	0	0	63	1920	1053	3	1804	925
V/C Ratio(X)	0.62	0.00	0.00	0.55	0.00	0.00	0.57	0.61	0.61	0.37	0.47	0.47
Avail Cap(c_a), veh/h	966	507	0	462	0	0	193	3129	1717	134	3016	1546
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.6	0.0	0.0	30.2	0.0	0.0	29.8	8.1	8.1	31.4	8.2	8.3
Incr Delay (d2), s/veh	2.1	0.0	0.0	10.2	0.0	0.0	8.1	0.3	0.6	69.1	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	0.0	0.5	0.0	0.0	0.7	4.0	4.5	0.1	2.8	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.7	0.0	0.0	40.4	0.0	0.0	37.8	8.4	8.7	100.5	8.4	8.6
LnGrp LOS	C	A	A	D	A	A	D	A	A	F	A	A
Approach Vol, veh/h		189			24			1863			1272	
Approach Delay, s/veh		29.7			40.4			9.1			8.6	
Approach LOS		C			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	41.9		10.1	6.8	39.7		6.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	61.0		18.0	7.2	58.8		18.0				
Max Q Clear Time (g_c+I1), s	2.0	16.7		5.4	3.3	11.8		2.9				
Green Ext Time (p_c), s	0.0	20.7		0.5	0.0	12.1		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		10.3
HCM 6th LOS		B

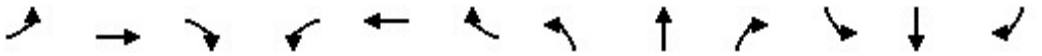
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			233			193			193			193
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



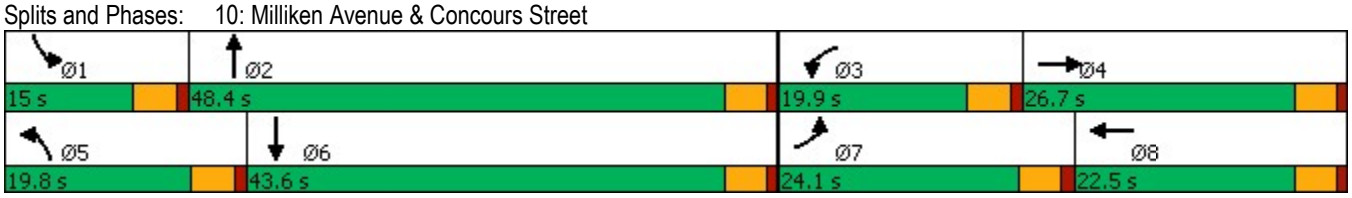
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	363	128	224	166	66	112	284	1599	125	177	1191	169
Future Volume (vph)	363	128	224	166	66	112	284	1599	125	177	1191	169
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	378	133	233	173	69	117	296	1666	130	184	1241	176
Shared Lane Traffic (%)												
Lane Group Flow (vph)	378	133	233	173	69	117	296	1666	130	184	1241	176

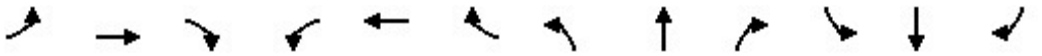
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	363	128	224	166	66	112	284	1599	125	177	1191	169
Future Volume (vph)	363	128	224	166	66	112	284	1599	125	177	1191	169
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	24.1	26.7		19.9	22.5		19.8	48.4		15.0	43.6	
Total Split (%)	21.9%	24.3%		18.1%	20.5%		18.0%	44.0%		13.6%	39.6%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	18.6	12.3	90.5	11.0	7.4	90.5	13.8	38.9	90.5	9.9	35.1	90.5
Actuated g/C Ratio	0.21	0.14	1.00	0.12	0.08	1.00	0.15	0.43	1.00	0.11	0.39	1.00
v/c Ratio	0.64	0.29	0.16	0.50	0.25	0.08	0.67	0.64	0.09	0.58	0.53	0.12
Control Delay	40.8	38.9	0.2	44.3	44.7	0.1	46.5	21.9	0.1	49.1	22.8	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	38.9	0.2	44.3	44.7	0.1	46.5	21.9	0.1	49.1	22.8	0.2
LOS	D	D	A	D	D	A	D	C	A	D	C	A
Approach Delay		27.8			30.0			24.0			23.3	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 90.5	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 24.8	Intersection LOS: C
Intersection Capacity Utilization 61.9%	ICU Level of Service B
Analysis Period (min) 15	

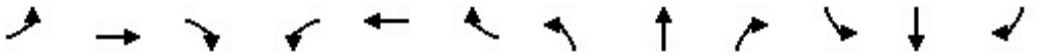
Splits and Phases: 10: Milliken Avenue & Concours Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	378	133	233	173	69	117	296	1666	130	184	1241	176
v/c Ratio	0.64	0.29	0.16	0.50	0.25	0.08	0.67	0.64	0.09	0.58	0.53	0.12
Control Delay	40.8	38.9	0.2	44.3	44.7	0.1	46.5	21.9	0.1	49.1	22.8	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	38.9	0.2	44.3	44.7	0.1	46.5	21.9	0.1	49.1	22.8	0.2
Queue Length 50th (ft)	113	38	0	52	21	0	89	221	0	56	165	0
Queue Length 95th (ft)	168	70	0	87	44	0	140	278	0	95	211	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	641	842	1500	504	683	1500	500	3017	1500	343	2688	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.16	0.16	0.34	0.10	0.08	0.59	0.55	0.09	0.54	0.46	0.12

Intersection Summary



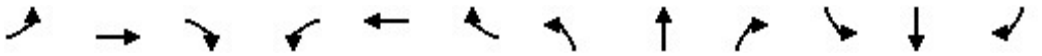
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	363	128	224	166	66	112	284	1599	125	177	1191	169
Future Volume (veh/h)	363	128	224	166	66	112	284	1599	125	177	1191	169
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	378	133	0	173	69	0	296	1666	0	184	1241	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	477	486		253	226		384	2667		259	2405	
Arrive On Green	0.16	0.14	0.00	0.09	0.07	0.00	0.13	0.44	0.00	0.09	0.39	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	378	133	0	173	69	0	296	1666	0	184	1241	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	9.3	2.6	0.0	4.3	1.4	0.0	7.3	15.7	0.0	4.6	11.5	0.0
Cycle Q Clear(g_c), s	9.3	2.6	0.0	4.3	1.4	0.0	7.3	15.7	0.0	4.6	11.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	477	486		253	226		384	2667		259	2405	
V/C Ratio(X)	0.79	0.27		0.68	0.30		0.77	0.62		0.71	0.52	
Avail Cap(c_a), veh/h	768	1006		603	816		599	3602		411	3208	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.9	28.3	0.0	32.9	33.0	0.0	31.2	16.2	0.0	32.9	17.1	0.0
Incr Delay (d2), s/veh	3.0	0.3	0.0	3.3	0.8	0.0	3.3	0.2	0.0	3.6	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	1.0	0.0	1.6	0.6	0.0	2.7	5.0	0.0	1.7	3.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.9	28.6	0.0	36.2	33.7	0.0	34.4	16.4	0.0	36.5	17.3	0.0
LnGrp LOS	C	C		D	C		C	B		D	B	
Approach Vol, veh/h		511	A		242	A		1962	A		1425	A
Approach Delay, s/veh		31.8			35.5			19.1			19.7	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.1	37.0	10.9	15.2	14.3	33.8	16.7	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	43.9	15.4	22.2	15.3	39.1	19.6	18.0
Max Q Clear Time (g_c+I1), s	6.6	17.7	6.3	4.6	9.3	13.5	11.3	3.4
Green Ext Time (p_c), s	0.2	14.8	0.3	0.6	0.5	10.3	0.9	0.2

Intersection Summary	
HCM 6th Ctrl Delay	21.9
HCM 6th LOS	C

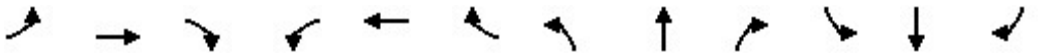
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55			177			236			177
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



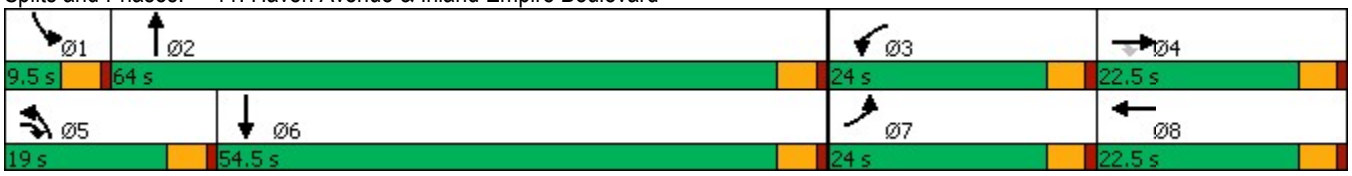
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	163	210	464	613	151	39	338	1860	418	40	2159	44
Future Volume (vph)	163	210	464	613	151	39	338	1860	418	40	2159	44
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	175	226	499	659	162	42	363	2000	449	43	2322	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	175	226	499	659	162	42	363	2000	449	43	2322	47

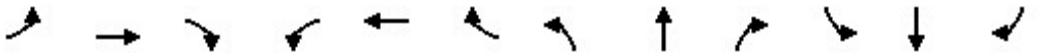
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	210	464	613	151	39	338	1860	418	40	2159	44
Future Volume (vph)	163	210	464	613	151	39	338	1860	418	40	2159	44
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	24.0	22.5	19.0	24.0	22.5		19.0	64.0		9.5	54.5	
Total Split (%)	20.0%	18.8%	15.8%	20.0%	18.8%		15.8%	53.3%		7.9%	45.4%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	12.2	13.0	32.0	19.5	20.3	115.1	14.5	61.5	115.1	5.0	50.0	115.1
Actuated g/C Ratio	0.11	0.11	0.28	0.17	0.18	1.00	0.13	0.53	1.00	0.04	0.43	1.00
v/c Ratio	0.57	0.60	1.09	0.99	0.27	0.03	1.00	0.62	0.30	0.34	0.88	0.03
Control Delay	56.4	55.3	104.9	80.0	43.0	0.0	97.5	20.4	0.5	62.1	34.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.4	55.3	104.9	80.0	43.0	0.0	97.5	20.4	0.5	62.1	34.9	0.0
LOS	E	E	F	F	D	A	F	C	A	E	C	A
Approach Delay		83.0			69.2			27.1			34.7	
Approach LOS		F			E			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 115.1	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 42.2	Intersection LOS: D
Intersection Capacity Utilization 89.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard



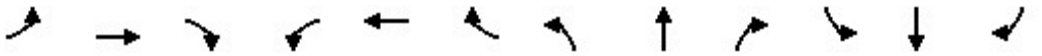


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	175	226	499	659	162	42	363	2000	449	43	2322	47
v/c Ratio	0.57	0.60	1.09	0.99	0.27	0.03	1.00	0.62	0.30	0.34	0.88	0.03
Control Delay	56.4	55.3	104.9	80.0	43.0	0.0	97.5	20.4	0.5	62.1	34.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.4	55.3	104.9	80.0	43.0	0.0	97.5	20.4	0.5	62.1	34.9	0.0
Queue Length 50th (ft)	64	85	~387	174	55	0	140	298	0	16	447	0
Queue Length 95th (ft)	101	126	#587	#271	91	0	#251	363	0	36	533	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	490	524	457	668	591	1500	364	3244	1500	125	2639	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.43	1.09	0.99	0.27	0.03	1.00	0.62	0.30	0.34	0.88	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



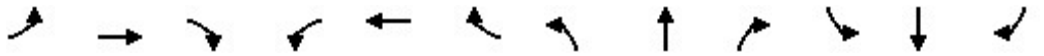
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	210	464	613	151	39	338	1860	418	40	2159	44
Future Volume (veh/h)	163	210	464	613	151	39	338	1860	418	40	2159	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	175	226	499	659	162	0	363	2000	0	43	2322	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	229	506	408	646	790		353	3074		92	2529	
Arrive On Green	0.08	0.15	0.15	0.16	0.23	0.00	0.12	0.50	0.00	0.03	0.41	0.00
Sat Flow, veh/h	2910	3367	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	175	226	499	659	162	0	363	2000	0	43	2322	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	7.1	7.3	18.0	19.5	4.6	0.0	14.5	29.0	0.0	1.7	43.1	0.0
Cycle Q Clear(g_c), s	7.1	7.3	18.0	19.5	4.6	0.0	14.5	29.0	0.0	1.7	43.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	229	506	408	646	790		353	3074		92	2529	
V/C Ratio(X)	0.76	0.45	1.22	1.02	0.20		1.03	0.65		0.46	0.92	
Avail Cap(c_a), veh/h	474	506	408	646	790		353	3074		122	2547	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	54.0	46.3	43.6	50.1	36.8	0.0	52.6	21.9	0.0	56.9	33.1	0.0
Incr Delay (d2), s/veh	5.3	0.6	120.7	40.4	0.1	0.0	55.7	0.5	0.0	3.6	5.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	3.1	25.6	8.8	1.9	0.0	8.0	10.2	0.0	0.7	16.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.3	46.9	164.2	90.5	36.9	0.0	108.2	22.4	0.0	60.5	39.0	0.0
LnGrp LOS	E	D	F	F	D		F	C		E	D	
Approach Vol, veh/h		900			821	A		2363	A		2365	A
Approach Delay, s/veh		114.4			79.9			35.6			39.4	
Approach LOS		F			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.3	64.8	24.0	22.5	19.0	54.2	13.9	32.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	59.5	19.5	18.0	14.5	50.0	19.5	18.0
Max Q Clear Time (g_c+I1), s	3.7	31.0	21.5	20.0	16.5	45.1	9.1	6.6
Green Ext Time (p_c), s	0.0	19.2	0.0	0.0	0.0	4.6	0.4	0.6

Intersection Summary	
HCM 6th Ctrl Delay	53.6
HCM 6th LOS	D

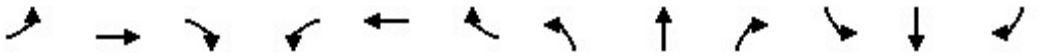
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			326			177			177			177
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



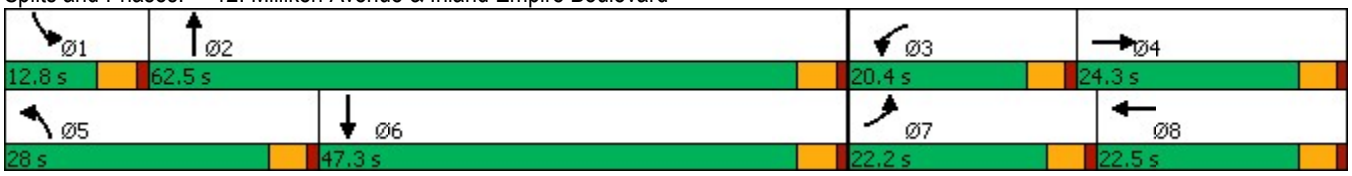
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	283	276	310	204	75	83	376	1618	351	93	1420	114
Future Volume (vph)	283	276	310	204	75	83	376	1618	351	93	1420	114
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	298	291	326	215	79	87	396	1703	369	98	1495	120
Shared Lane Traffic (%)												
Lane Group Flow (vph)	298	291	326	215	79	87	396	1703	369	98	1495	120

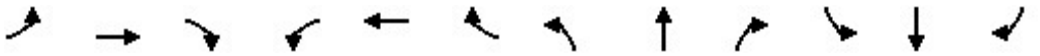
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	283	276	310	204	75	83	376	1618	351	93	1420	114
Future Volume (vph)	283	276	310	204	75	83	376	1618	351	93	1420	114
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	22.2	24.3		20.4	22.5		28.0	62.5		12.8	47.3	
Total Split (%)	18.5%	20.3%		17.0%	18.8%		23.3%	52.1%		10.7%	39.4%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	18.5	14.6	102.5	12.9	11.8	102.5	19.1	51.6	102.5	7.9	37.5	102.5
Actuated g/C Ratio	0.18	0.14	1.00	0.13	0.12	1.00	0.19	0.50	1.00	0.08	0.37	1.00
v/c Ratio	0.57	0.61	0.22	0.59	0.21	0.06	0.74	0.56	0.25	0.44	0.67	0.08
Control Delay	47.5	49.1	0.3	52.0	45.2	0.1	49.9	19.5	0.4	56.4	29.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.5	49.1	0.3	52.0	45.2	0.1	49.9	19.5	0.4	56.4	29.9	0.1
LOS	D	D	A	D	D	A	D	B	A	E	C	A
Approach Delay		31.2			38.7			21.5			29.3	
Approach LOS		C			D			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 102.5	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 26.8	Intersection LOS: C
Intersection Capacity Utilization 64.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	298	291	326	215	79	87	396	1703	369	98	1495	120
v/c Ratio	0.57	0.61	0.22	0.59	0.21	0.06	0.74	0.56	0.25	0.44	0.67	0.08
Control Delay	47.5	49.1	0.3	52.0	45.2	0.1	49.9	19.5	0.4	56.4	29.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.5	49.1	0.3	52.0	45.2	0.1	49.9	19.5	0.4	56.4	29.9	0.1
Queue Length 50th (ft)	100	100	0	72	26	0	132	232	0	33	241	0
Queue Length 95th (ft)	164	156	0	122	52	0	204	305	0	67	328	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	552	666	1500	461	606	1500	682	3536	1500	240	2609	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.44	0.22	0.47	0.13	0.06	0.58	0.48	0.25	0.41	0.57	0.08

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	283	276	310	204	75	83	376	1618	351	93	1420	114
Future Volume (veh/h)	283	276	310	204	75	83	376	1618	351	93	1420	114
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	298	291	0	215	79	0	396	1703	0	98	1495	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	383	418		294	315		493	3025		160	2329	
Arrive On Green	0.13	0.12	0.00	0.10	0.09	0.00	0.17	0.50	0.00	0.06	0.38	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	298	291	0	215	79	0	396	1703	0	98	1495	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	8.0	6.7	0.0	5.8	1.8	0.0	10.5	15.7	0.0	2.7	16.2	0.0
Cycle Q Clear(g_c), s	8.0	6.7	0.0	5.8	1.8	0.0	10.5	15.7	0.0	2.7	16.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	383	418		294	315		493	3025		160	2329	
V/C Ratio(X)	0.78	0.70		0.73	0.25		0.80	0.56		0.61	0.64	
Avail Cap(c_a), veh/h	639	828		574	752		849	4389		300	3239	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.8	33.8	0.0	35.1	33.9	0.0	32.2	14.2	0.0	37.2	20.4	0.0
Incr Delay (d2), s/veh	3.4	2.1	0.0	3.5	0.4	0.0	3.1	0.2	0.0	3.7	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	2.8	0.0	2.1	0.7	0.0	3.8	5.0	0.0	1.0	5.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.3	35.9	0.0	38.6	34.3	0.0	35.3	14.4	0.0	40.9	20.7	0.0
LnGrp LOS	D	D		D	C		D	B		D	C	
Approach Vol, veh/h		589	A		294	A		2099	A		1593	A
Approach Delay, s/veh		36.6			37.5			18.3			21.9	
Approach LOS		D			D			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.9	44.5	12.6	14.5	18.1	35.3	15.1	12.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.3	58.0	15.9	19.8	23.5	42.8	17.7	18.0
Max Q Clear Time (g_c+I1), s	4.7	17.7	7.8	8.7	12.5	18.2	10.0	3.8
Green Ext Time (p_c), s	0.1	19.0	0.4	1.3	1.1	12.6	0.6	0.3

Intersection Summary	
HCM 6th Ctrl Delay	23.2
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.983	0.850				
Flt Protected	0.957					
Satd. Flow (prot)	3042	1365	6071	0	0	6071
Flt Permitted	0.957					
Satd. Flow (perm)	3042	1365	6071	0	0	6071
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	4	4				
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	479	302	2186	0	0	2178
Future Volume (vph)	479	302	2186	0	0	2178
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	499	315	2277	0	0	2269
Shared Lane Traffic (%)		20%				
Lane Group Flow (vph)	562	252	2277	0	0	2269

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	479	302	2186	2178
Future Volume (vph)	479	302	2186	2178
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	41.0	41.0
Total Split (%)	36.9%	36.9%	63.1%	63.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	16.2	16.2	36.6	36.6
Actuated g/C Ratio	0.26	0.26	0.59	0.59
v/c Ratio	0.70	0.70	0.63	0.63
Control Delay	25.6	31.4	9.7	9.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.6	31.4	9.7	9.7
LOS	C	C	A	A
Approach Delay	27.4		9.7	9.7
Approach LOS	C		A	A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 61.8	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 12.4	Intersection LOS: B
Intersection Capacity Utilization 63.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	562	252	2277	2269
v/c Ratio	0.70	0.70	0.63	0.63
Control Delay	25.6	31.4	9.7	9.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.6	31.4	9.7	9.7
Queue Length 50th (ft)	96	91	149	148
Queue Length 95th (ft)	144	169	203	202
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	965	434	3597	3597
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.58	0.63	0.63

Intersection Summary

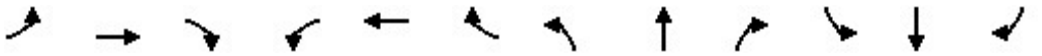
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	479	302	2186	0	0	2178
Future Volume (veh/h)	479	302	2186	0	0	2178
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1673	1772	1772	0	0	1772
Adj Flow Rate, veh/h	540	271	2277	0	0	2269
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	772	364	3617	0	0	3617
Arrive On Green	0.24	0.24	0.59	0.00	0.00	0.59
Sat Flow, veh/h	3188	1502	6592	0	0	6592
Grp Volume(v), veh/h	540	271	2277	0	0	2269
Grp Sat Flow(s),veh/h/ln	1594	1502	1524	0	0	1524
Q Serve(g_s), s	8.5	9.1	13.3	0.0	0.0	13.2
Cycle Q Clear(g_c), s	8.5	9.1	13.3	0.0	0.0	13.2
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	772	364	3617	0	0	3617
V/C Ratio(X)	0.70	0.75	0.63	0.00	0.00	0.63
Avail Cap(c_a), veh/h	1135	535	4064	0	0	4064
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	18.9	19.2	7.2	0.0	0.0	7.2
Incr Delay (d2), s/veh	1.2	3.2	0.3	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	3.2	3.1	0.0	0.0	3.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.1	22.4	7.5	0.0	0.0	7.5
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	811		2277			2269
Approach Delay, s/veh	20.9		7.5			7.5
Approach LOS	C		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		37.0			37.0	17.8
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		36.5			36.5	19.5
Max Q Clear Time (g_c+I1), s		15.3			15.2	11.1
Green Ext Time (p_c), s		17.2			17.2	2.1

Intersection Summary	
HCM 6th Ctrl Delay	9.5
HCM 6th LOS	A

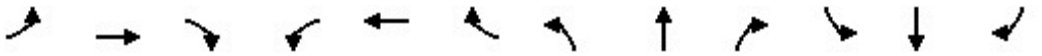
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			147			136			294			60
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



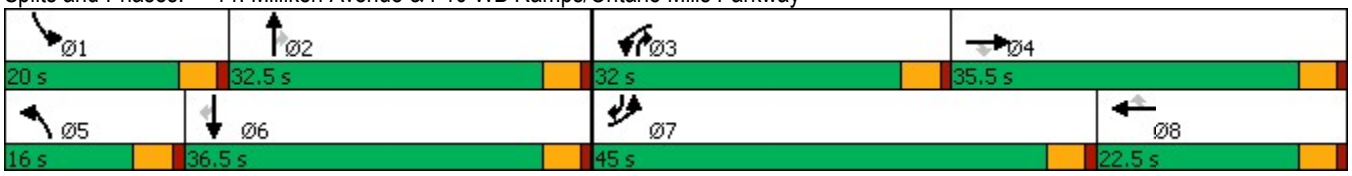
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	822	189	228	243	289	61	231	993	435	319	1101	460
Future Volume (vph)	822	189	228	243	289	61	231	993	435	319	1101	460
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	856	197	238	253	301	64	241	1034	453	332	1147	479
Shared Lane Traffic (%)												
Lane Group Flow (vph)	856	197	238	253	301	64	241	1034	453	332	1147	479

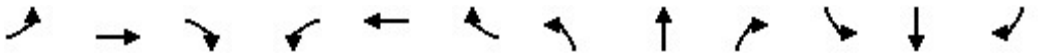
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	822	189	228	243	289	61	231	993	435	319	1101	460
Future Volume (vph)	822	189	228	243	289	61	231	993	435	319	1101	460
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	45.0	35.5	35.5	32.0	22.5	22.5	16.0	32.5	32.0	20.0	36.5	45.0
Total Split (%)	37.5%	29.6%	29.6%	26.7%	18.8%	18.8%	13.3%	27.1%	26.7%	16.7%	30.4%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	37.1	36.5	36.5	15.5	15.0	15.0	11.5	26.0	46.1	15.2	29.7	71.4
Actuated g/C Ratio	0.33	0.33	0.33	0.14	0.13	0.13	0.10	0.23	0.41	0.14	0.27	0.64
v/c Ratio	0.89	0.34	0.40	0.63	0.67	0.20	0.81	0.73	0.57	0.84	0.71	0.49
Control Delay	48.4	31.5	14.2	53.4	54.7	1.4	72.1	43.6	11.3	68.4	40.3	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.4	31.5	14.2	53.4	54.7	1.4	72.1	43.6	11.3	68.4	40.3	11.1
LOS	D	C	B	D	D	A	E	D	B	E	D	B
Approach Delay		39.5			48.6			39.1			37.9	
Approach LOS		D			D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 111.5	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 39.8	Intersection LOS: D
Intersection Capacity Utilization 77.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway

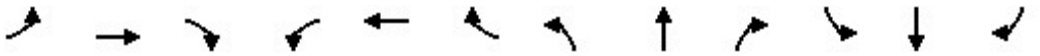




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	856	197	238	253	301	64	241	1034	453	332	1147	479
v/c Ratio	0.89	0.34	0.40	0.63	0.67	0.20	0.81	0.73	0.57	0.84	0.71	0.49
Control Delay	48.4	31.5	14.2	53.4	54.7	1.4	72.1	43.6	11.3	68.4	40.3	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.4	31.5	14.2	53.4	54.7	1.4	72.1	43.6	11.3	68.4	40.3	11.1
Queue Length 50th (ft)	310	110	48	95	115	0	94	211	83	129	227	145
Queue Length 95th (ft)	#431	186	124	135	164	0	#170	257	176	#215	275	233
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	1062	588	598	721	547	358	301	1542	925	406	1763	1032
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.34	0.40	0.35	0.55	0.18	0.80	0.67	0.49	0.82	0.65	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	822	189	228	243	289	61	231	993	435	319	1101	460
Future Volume (veh/h)	822	189	228	243	289	61	231	993	435	319	1101	460
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	856	197	238	253	301	64	241	1034	453	332	1147	479
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	939	582	493	321	391	174	292	1592	558	385	1785	924
Arrive On Green	0.32	0.33	0.33	0.11	0.12	0.12	0.10	0.26	0.26	0.13	0.29	0.29
Sat Flow, veh/h	2910	1772	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	856	197	238	253	301	64	241	1034	453	332	1147	479
Grp Sat Flow(s),veh/h/ln	1455	1772	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	30.3	9.0	13.6	9.1	9.3	4.2	8.7	16.2	28.0	12.0	17.6	19.3
Cycle Q Clear(g_c), s	30.3	9.0	13.6	9.1	9.3	4.2	8.7	16.2	28.0	12.0	17.6	19.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	939	582	493	321	391	174	292	1592	558	385	1785	924
V/C Ratio(X)	0.91	0.34	0.48	0.79	0.77	0.37	0.82	0.65	0.81	0.86	0.64	0.52
Avail Cap(c_a), veh/h	1099	582	493	746	565	252	312	1592	558	421	1819	933
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.8	27.2	28.7	46.5	46.0	43.8	47.3	35.3	30.3	45.6	33.0	11.6
Incr Delay (d2), s/veh	10.3	0.3	0.7	4.3	4.0	1.3	15.5	0.9	8.9	15.7	0.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.8	3.9	4.9	3.5	4.1	1.6	3.8	6.1	11.6	5.1	6.5	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.1	27.6	29.5	50.8	50.0	45.0	62.8	36.2	39.2	61.3	33.8	12.1
LnGrp LOS	D	C	C	D	D	D	E	D	D	E	C	B
Approach Vol, veh/h		1291			618			1728			1958	
Approach Delay, s/veh		39.5			49.8			40.7			33.1	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.7	32.5	16.3	39.7	15.3	35.9	39.1	16.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	28.0	27.5	31.0	11.5	32.0	40.5	18.0
Max Q Clear Time (g_c+I1), s	14.0	30.0	11.1	15.6	10.7	21.3	32.3	11.3
Green Ext Time (p_c), s	0.2	0.0	0.8	1.7	0.1	6.9	2.3	1.1

Intersection Summary	
HCM 6th Ctrl Delay	38.8
HCM 6th LOS	D

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.993	0.850				
Flt Protected	0.954					
Satd. Flow (prot)	3063	1365	0	6071	6071	0
Flt Permitted	0.954					
Satd. Flow (perm)	3063	1365	0	6071	6071	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	6	16				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

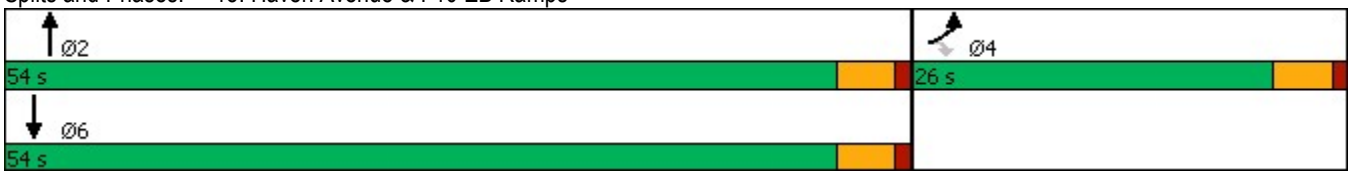
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	524	237	0	2369	1826	0
Future Volume (vph)	524	237	0	2369	1826	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	546	247	0	2468	1902	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	571	222	0	2468	1902	0

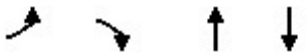
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	524	237	2369	1826
Future Volume (vph)	524	237	2369	1826
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	54.0	54.0
Total Split (%)	32.5%	32.5%	67.5%	67.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	18.6	18.6	49.1	49.1
Actuated g/C Ratio	0.24	0.24	0.64	0.64
v/c Ratio	0.76	0.65	0.64	0.49
Control Delay	34.2	33.8	9.7	8.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.2	33.8	9.7	8.1
LOS	C	C	A	A
Approach Delay	34.1		9.7	8.1
Approach LOS	C		A	A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 76.8	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 12.8	Intersection LOS: B
Intersection Capacity Utilization 63.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	571	222	2468	1902
v/c Ratio	0.76	0.65	0.64	0.49
Control Delay	34.2	33.8	9.7	8.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.2	33.8	9.7	8.1
Queue Length 50th (ft)	130	97	195	130
Queue Length 95th (ft)	185	176	243	163
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	864	394	3924	3924
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.66	0.56	0.63	0.48

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	524	237	0	2369	1826	0
Future Volume (veh/h)	524	237	0	2369	1826	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1772	0	1772	1772	0
Adj Flow Rate, veh/h	546	247	0	2468	1902	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	707	333	0	3931	3931	0
Arrive On Green	0.22	0.22	0.00	0.64	0.64	0.00
Sat Flow, veh/h	3188	1502	0	6592	6592	0
Grp Volume(v), veh/h	546	247	0	2468	1902	0
Grp Sat Flow(s),veh/h/ln	1594	1502	0	1524	1524	0
Q Serve(g_s), s	10.9	10.3	0.0	16.3	10.9	0.0
Cycle Q Clear(g_c), s	10.9	10.3	0.0	16.3	10.9	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	707	333	0	3931	3931	0
V/C Ratio(X)	0.77	0.74	0.00	0.63	0.48	0.00
Avail Cap(c_a), veh/h	1015	478	0	4469	4469	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.7	24.5	0.0	7.2	6.2	0.0
Incr Delay (d2), s/veh	2.3	3.6	0.0	0.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	3.8	0.0	4.0	2.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	27.0	28.1	0.0	7.4	6.3	0.0
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	793			2468	1902	
Approach Delay, s/veh	27.3			7.4	6.3	
Approach LOS	C			A	A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		48.0		19.5		48.0
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		49.5		21.5		49.5
Max Q Clear Time (g_c+I1), s		18.3		12.9		12.9
Green Ext Time (p_c), s		25.2		2.1		21.2

Intersection Summary	
HCM 6th Ctrl Delay	10.0
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1600	1800	1600	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2891	1500	2891	6071	6071	1500
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2891	1500	2891	6071	6071	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		11				92
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	493	194	313	1172	988	600
Future Volume (vph)	493	194	313	1172	988	600
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	508	200	323	1208	1019	619
Shared Lane Traffic (%)						
Lane Group Flow (vph)	508	200	323	1208	1019	619

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	493	194	313	1172	988	600
Future Volume (vph)	493	194	313	1172	988	600
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	22.5	14.9	14.9	37.5	22.6	22.5
Total Split (%)	37.5%	24.8%	24.8%	62.5%	37.7%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	15.0	29.3	9.7	30.6	16.3	35.8
Actuated g/C Ratio	0.27	0.54	0.18	0.56	0.30	0.65
v/c Ratio	0.64	0.25	0.63	0.36	0.56	0.61
Control Delay	22.0	7.6	28.2	7.3	18.1	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	7.6	28.2	7.3	18.1	7.5
LOS	C	A	C	A	B	A
Approach Delay	17.9			11.7	14.1	
Approach LOS	B			B	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 54.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 13.8	Intersection LOS: B
Intersection Capacity Utilization 57.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

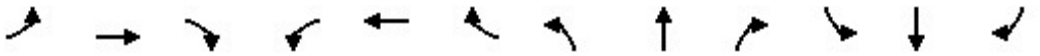
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	508	200	323	1208	1019	619
v/c Ratio	0.64	0.25	0.63	0.36	0.56	0.61
Control Delay	22.0	7.6	28.2	7.3	18.1	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	7.6	28.2	7.3	18.1	7.5
Queue Length 50th (ft)	79	32	55	60	86	77
Queue Length 95th (ft)	122	62	93	83	118	151
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	967	831	559	3724	2043	1099
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.24	0.58	0.32	0.50	0.56

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	493	194	313	1172	988	600
Future Volume (veh/h)	493	194	313	1172	988	600
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1772	1575	1772	1772	1772
Adj Flow Rate, veh/h	508	200	323	1208	1019	619
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	685	579	438	3587	2132	879
Arrive On Green	0.24	0.24	0.15	0.59	0.35	0.35
Sat Flow, veh/h	2910	1502	2910	6343	6343	1502
Grp Volume(v), veh/h	508	200	323	1208	1019	619
Grp Sat Flow(s),veh/h/ln	1455	1502	1455	1524	1524	1502
Q Serve(g_s), s	8.3	4.8	5.4	5.2	6.7	14.9
Cycle Q Clear(g_c), s	8.3	4.8	5.4	5.2	6.7	14.9
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	685	579	438	3587	2132	879
V/C Ratio(X)	0.74	0.35	0.74	0.34	0.48	0.70
Avail Cap(c_a), veh/h	1026	755	593	3940	2161	886
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.1	11.1	20.7	5.4	13.0	7.5
Incr Delay (d2), s/veh	1.6	0.4	3.2	0.1	0.2	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	4.6	1.9	1.1	2.0	7.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.7	11.5	23.9	5.4	13.1	10.0
LnGrp LOS	B	B	C	A	B	B
Approach Vol, veh/h	708			1531	1638	
Approach Delay, s/veh	17.4			9.3	11.9	
Approach LOS	B			A	B	

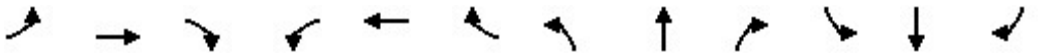
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		34.5		16.5	12.2	22.4
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		33.0		18.0	10.4	18.1
Max Q Clear Time (g_c+I1), s		7.2		10.3	7.4	16.9
Green Ext Time (p_c), s		10.0		1.8	0.3	1.0

Intersection Summary	
HCM 6th Ctrl Delay	11.9
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.972				0.850			0.850		0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4683	0	2891	3353	1500	2891	4818	1500	2891	6010	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4683	0	2891	3353	1500	2891	4818	1500	2891	6010	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		48				204			271		15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



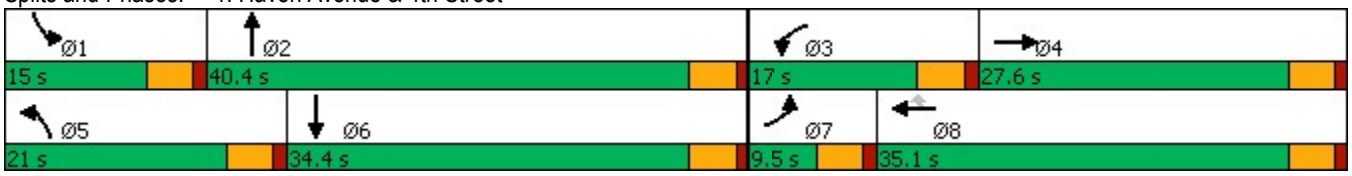
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	50	545	123	243	518	192	178	1103	362	199	1072	76
Future Volume (vph)	50	545	123	243	518	192	178	1103	362	199	1072	76
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	53	580	131	259	551	204	189	1173	385	212	1140	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	711	0	259	551	204	189	1173	385	212	1221	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	50	545	243	518	192	178	1103	362	199	1072
Future Volume (vph)	50	545	243	518	192	178	1103	362	199	1072
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	9.5	27.6	17.0	35.1	35.1	21.0	40.4		15.0	34.4
Total Split (%)	9.5%	27.6%	17.0%	35.1%	35.1%	21.0%	40.4%		15.0%	34.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	5.0	19.8	11.8	28.7	28.7	11.6	36.0	95.8	10.1	34.6
Actuated g/C Ratio	0.05	0.21	0.12	0.30	0.30	0.12	0.38	1.00	0.11	0.36
v/c Ratio	0.35	0.71	0.73	0.55	0.34	0.54	0.65	0.26	0.70	0.56
Control Delay	52.2	37.1	53.7	31.0	5.6	45.9	27.3	0.4	55.1	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.2	37.1	53.7	31.0	5.6	45.9	27.3	0.4	55.1	26.4
LOS	D	D	D	C	A	D	C	A	E	C
Approach Delay		38.2		31.7			23.4			30.7
Approach LOS		D		C			C			C

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 95.8	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 29.5	Intersection LOS: C
Intersection Capacity Utilization 66.5%	ICU Level of Service C
Analysis Period (min) 15	

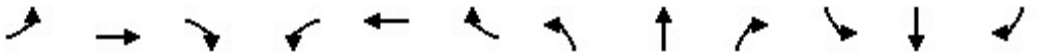
Splits and Phases: 1: Haven Avenue & 4th Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	53	711	259	551	204	189	1173	385	212	1221
v/c Ratio	0.35	0.71	0.73	0.55	0.34	0.54	0.65	0.26	0.70	0.56
Control Delay	52.2	37.1	53.7	31.0	5.6	45.9	27.3	0.4	55.1	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.2	37.1	53.7	31.0	5.6	45.9	27.3	0.4	55.1	26.4
Queue Length 50th (ft)	16	139	80	152	0	57	219	0	66	173
Queue Length 95th (ft)	37	183	#134	206	51	91	280	0	#115	231
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	151	1169	378	1074	619	499	1811	1500	317	2177
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.61	0.69	0.51	0.33	0.38	0.65	0.26	0.67	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



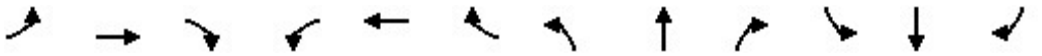
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	545	123	243	518	192	178	1103	362	199	1072	76
Future Volume (veh/h)	50	545	123	243	518	192	178	1103	362	199	1072	76
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	53	580	131	259	551	204	189	1173	0	212	1140	81
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	119	777	172	324	898	401	259	1927		275	2364	167
Arrive On Green	0.04	0.20	0.20	0.11	0.27	0.27	0.09	0.40	0.00	0.09	0.40	0.40
Sat Flow, veh/h	2910	3961	878	2910	3367	1502	2910	4837	1502	2910	5855	414
Grp Volume(v), veh/h	53	470	241	259	551	204	189	1173	0	212	889	332
Grp Sat Flow(s),veh/h/ln	1455	1612	1614	1455	1683	1502	1455	1612	1502	1455	1524	1697
Q Serve(g_s), s	1.6	12.4	12.7	7.8	12.9	10.4	5.7	17.4	0.0	6.4	13.0	13.1
Cycle Q Clear(g_c), s	1.6	12.4	12.7	7.8	12.9	10.4	5.7	17.4	0.0	6.4	13.0	13.1
Prop In Lane	1.00		0.54	1.00		1.00	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	119	632	317	324	898	401	259	1927		275	1846	685
V/C Ratio(X)	0.45	0.74	0.76	0.80	0.61	0.51	0.73	0.61		0.77	0.48	0.48
Avail Cap(c_a), veh/h	161	827	414	404	1143	510	533	1927		339	1846	685
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.2	34.1	34.2	39.1	29.0	28.0	40.0	21.5	0.0	39.9	19.9	19.9
Incr Delay (d2), s/veh	2.6	2.6	5.9	8.8	0.7	1.0	3.9	1.4	0.0	8.4	0.9	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	5.0	5.4	3.1	5.2	3.8	2.2	6.5	0.0	2.6	4.6	5.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.9	36.7	40.2	47.9	29.7	29.0	44.0	23.0	0.0	48.3	20.8	22.4
LnGrp LOS	D	D	D	D	C	C	D	C		D	C	C
Approach Vol, veh/h		764			1014			1362	A		1433	
Approach Delay, s/veh		38.4			34.2			25.9			25.2	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	40.4	14.5	22.2	12.5	40.9	8.2	28.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	35.9	12.5	23.1	16.5	29.9	5.0	30.6
Max Q Clear Time (g_c+I1), s	8.4	19.4	9.8	14.7	7.7	15.1	3.6	14.9
Green Ext Time (p_c), s	0.1	7.7	0.2	3.0	0.4	7.3	0.0	4.0

Intersection Summary	
HCM 6th Ctrl Delay	29.6
HCM 6th LOS	C

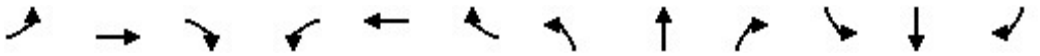
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.992				0.850			0.850		0.850	
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1667	6022	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1667	6022	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16				153			387		272	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



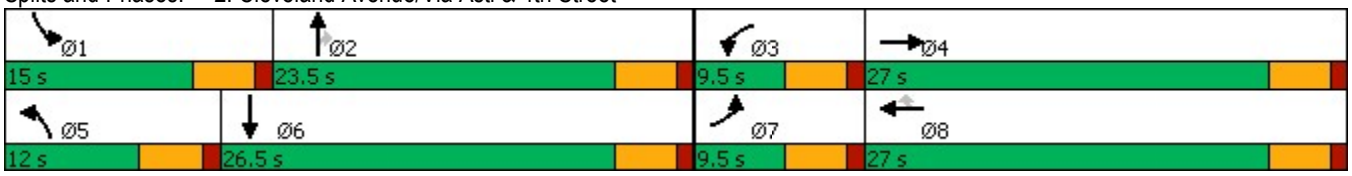
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	1125	64	3	906	4	59	0	4	3	0	1
Future Volume (vph)	0	1125	64	3	906	4	59	0	4	3	0	1
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1160	66	3	934	4	61	0	4	3	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1226	0	3	934	4	61	0	4	3	1	0

Intersection Summary

Lane Group	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT	Ø7
Lane Configurations									
Traffic Volume (vph)	1125	3	906	4	59	4	3	0	
Future Volume (vph)	1125	3	906	4	59	4	3	0	
Turn Type	NA	Prot	NA	Perm	Prot	Perm	Prot	NA	
Protected Phases	4	3	8		5		1	6	7
Permitted Phases				8		2			
Detector Phase	4	3	8	8	5	2	1	6	
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5	9.5
Total Split (s)	27.0	9.5	27.0	27.0	12.0	23.5	15.0	26.5	9.5
Total Split (%)	36.0%	12.7%	36.0%	36.0%	16.0%	31.3%	20.0%	35.3%	13%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min	None
Act Effct Green (s)	18.9	5.5	20.2	20.2	7.1	10.4	6.1	6.0	
Actuated g/C Ratio	0.45	0.13	0.48	0.48	0.17	0.25	0.15	0.14	
v/c Ratio	0.45	0.01	0.40	0.00	0.23	0.01	0.01	0.00	
Control Delay	9.7	22.7	8.0	0.0	22.2	0.0	22.0	0.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	9.7	22.7	8.0	0.0	22.2	0.0	22.0	0.0	
LOS	A	C	A	A	C	A	C	A	
Approach Delay	9.7		8.0					16.5	
Approach LOS	A		A					B	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 42	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 9.3	Intersection LOS: A
Intersection Capacity Utilization 37.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street



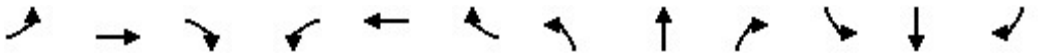
Lane Group	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	1226	3	934	4	61	4	3	1
v/c Ratio	0.45	0.01	0.40	0.00	0.23	0.01	0.01	0.00
Control Delay	9.7	22.7	8.0	0.0	22.2	0.0	22.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.7	22.7	8.0	0.0	22.2	0.0	22.0	0.0
Queue Length 50th (ft)	61	1	59	0	14	0	1	0
Queue Length 95th (ft)	120	8	83	0	50	0	8	0
Internal Link Dist (ft)	2546		362					358
Turn Bay Length (ft)		130		145	165	165	50	
Base Capacity (vph)	3531	206	2976	985	308	937	432	1747
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.01	0.31	0.00	0.20	0.00	0.01	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1125	64	3	906	4	59	0	4	3	0	1
Future Volume (veh/h)	0	1125	64	3	906	4	59	0	4	3	0	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	0	1160	66	3	934	4	61	0	4	3	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	4	2224	126	7	2360	733	97	317	269	7	205	183
Arrive On Green	0.00	0.37	0.37	0.00	0.49	0.49	0.06	0.00	0.18	0.00	0.00	0.12
Sat Flow, veh/h	1594	5946	337	1594	4837	1502	1594	1772	1502	1594	1683	1502
Grp Volume(v), veh/h	0	891	335	3	934	4	61	0	4	3	0	1
Grp Sat Flow(s),veh/h/ln	1594	1524	1711	1594	1612	1502	1594	1772	1502	1594	1683	1502
Q Serve(g_s), s	0.0	6.2	6.3	0.1	5.0	0.1	1.5	0.0	0.1	0.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	6.2	6.3	0.1	5.0	0.1	1.5	0.0	0.1	0.1	0.0	0.0
Prop In Lane	1.00		0.20	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	4	1710	640	7	2360	733	97	317	269	7	205	183
V/C Ratio(X)	0.00	0.52	0.52	0.46	0.40	0.01	0.63	0.00	0.01	0.46	0.00	0.01
Avail Cap(c_a), veh/h	194	2508	939	194	2653	824	291	821	696	408	903	805
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	10.0	10.0	20.4	6.7	5.4	18.8	0.0	13.9	20.4	0.0	15.8
Incr Delay (d2), s/veh	0.0	0.2	0.7	43.0	0.1	0.0	6.5	0.0	0.0	43.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.6	1.9	0.1	1.2	0.0	0.7	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	10.2	10.7	63.4	6.8	5.4	25.3	0.0	13.9	63.4	0.0	15.8
LnGrp LOS	A	B	B	E	A	A	C	A	B	E	A	B
Approach Vol, veh/h		1226			941			65			4	
Approach Delay, s/veh		10.3			6.9			24.6			51.5	
Approach LOS		B			A			C			D	

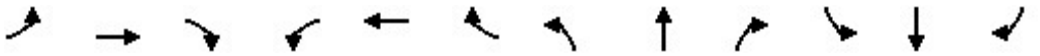
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	11.8	4.7	19.8	7.0	9.5	0.0	24.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	19.0	5.0	22.5	7.5	22.0	5.0	22.5
Max Q Clear Time (g_c+I1), s	2.1	2.1	2.1	8.3	3.5	2.0	0.0	7.0
Green Ext Time (p_c), s	0.0	0.0	0.0	7.1	0.0	0.0	0.0	5.9

Intersection Summary	
HCM 6th Ctrl Delay	9.4
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.993				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.953	
Satd. Flow (prot)	2891	6065	0	1583	4784	0	1583	1765	1500	0	1682	1500
Flt Permitted	0.950			0.950			0.726				0.731	
Satd. Flow (perm)	2891	6065	0	1583	4784	0	1210	1765	1500	0	1290	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			15				226			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



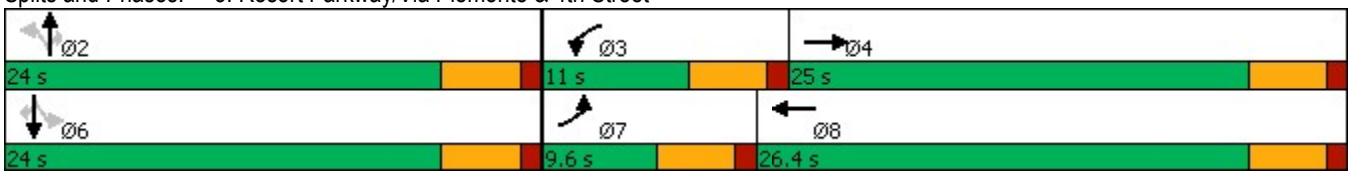
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	11	1106	8	65	850	45	32	0	37	45	1	15
Future Volume (vph)	11	1106	8	65	850	45	32	0	37	45	1	15
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	1140	8	67	876	46	33	0	38	46	1	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	1148	0	67	922	0	33	0	38	0	47	15

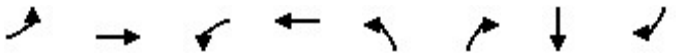
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	11	1106	65	850	32	37	45	1	15
Future Volume (vph)	11	1106	65	850	32	37	45	1	15
Turn Type	Prot	NA	Prot	NA	Perm	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8				6	
Permitted Phases					2	2	6		6
Detector Phase	7	4	3	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.6	25.0	11.0	26.4	24.0	24.0	24.0	24.0	24.0
Total Split (%)	16.0%	41.7%	18.3%	44.0%	40.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min
Act Effct Green (s)	5.5	17.1	6.6	21.0	7.3	7.3		7.3	7.3
Actuated g/C Ratio	0.14	0.43	0.17	0.53	0.18	0.18		0.18	0.18
v/c Ratio	0.03	0.44	0.25	0.36	0.15	0.08		0.20	0.04
Control Delay	19.9	9.3	21.2	6.1	18.8	0.4		19.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	19.9	9.3	21.2	6.1	18.8	0.4		19.3	0.2
LOS	B	A	C	A	B	A		B	A
Approach Delay		9.4		7.1				14.7	
Approach LOS		A		A				B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 39.6	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 8.6	Intersection LOS: A
Intersection Capacity Utilization 43.2%	ICU Level of Service A
Analysis Period (min) 15	

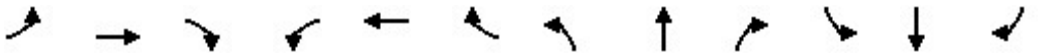
Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street





Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBT	SBR
Lane Group Flow (vph)	11	1148	67	922	33	38	47	15
v/c Ratio	0.03	0.44	0.25	0.36	0.15	0.08	0.20	0.04
Control Delay	19.9	9.3	21.2	6.1	18.8	0.4	19.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.9	9.3	21.2	6.1	18.8	0.4	19.3	0.2
Queue Length 50th (ft)	1	59	16	28	8	0	11	0
Queue Length 95th (ft)	7	90	47	89	27	0	34	0
Internal Link Dist (ft)		362		428			378	
Turn Bay Length (ft)	220		125		115	115		110
Base Capacity (vph)	402	3398	281	3214	644	904	687	850
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.34	0.24	0.29	0.05	0.04	0.07	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1106	8	65	850	45	32	0	37	45	1	15
Future Volume (veh/h)	11	1106	8	65	850	45	32	0	37	45	1	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	11	1140	8	67	876	46	33	0	38	46	1	15
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	42	2432	17	110	2075	109	367	261	221	406	7	221
Arrive On Green	0.01	0.39	0.39	0.07	0.44	0.44	0.15	0.00	0.15	0.15	0.15	0.15
Sat Flow, veh/h	2910	6291	44	1594	4706	247	1320	1772	1502	1335	44	1502
Grp Volume(v), veh/h	11	828	320	67	600	322	33	0	38	47	0	15
Grp Sat Flow(s),veh/h/ln	1455	1524	1764	1594	1612	1728	1320	1772	1502	1380	0	1502
Q Serve(g_s), s	0.1	4.6	4.6	1.4	4.3	4.4	0.8	0.0	0.8	1.0	0.0	0.3
Cycle Q Clear(g_c), s	0.1	4.6	4.6	1.4	4.3	4.4	1.8	0.0	0.8	1.0	0.0	0.3
Prop In Lane	1.00		0.03	1.00		0.14	1.00		1.00	0.98		1.00
Lane Grp Cap(c), veh/h	42	1767	682	110	1422	762	367	261	221	413	0	221
V/C Ratio(X)	0.26	0.47	0.47	0.61	0.42	0.42	0.09	0.00	0.17	0.11	0.00	0.07
Avail Cap(c_a), veh/h	437	2758	1064	305	2079	1114	930	1017	862	1000	0	862
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.6	7.8	7.8	15.4	6.5	6.5	13.6	0.0	12.7	12.8	0.0	12.5
Incr Delay (d2), s/veh	3.2	0.2	0.5	5.4	0.2	0.4	0.1	0.0	0.4	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.0	1.2	0.6	0.9	1.0	0.2	0.0	0.2	0.3	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.8	8.0	8.3	20.7	6.7	6.9	13.7	0.0	13.0	12.9	0.0	12.6
LnGrp LOS	B	A	A	C	A	A	B	A	B	B	A	B
Approach Vol, veh/h		1159			989			71			62	
Approach Delay, s/veh		8.2			7.7			13.3			12.8	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	6.8	17.6		9.5	5.0	19.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		19.5	6.5	20.5		19.5	5.1	21.9				
Max Q Clear Time (g_c+I1), s		3.8	3.4	6.6		3.0	2.1	6.4				
Green Ext Time (p_c), s		0.1	0.0	6.5		0.2	0.0	5.5				

Intersection Summary	
HCM 6th Ctrl Delay	8.3
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.991					0.865
Flt Protected						
Satd. Flow (prot)	4774	0	0	4818	0	1526
Flt Permitted						
Satd. Flow (perm)	4774	0	0	4818	0	1526
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	1116	72	0	980	0	44
Future Volume (vph)	1116	72	0	980	0	44
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1175	76	0	1032	0	46
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1251	0	0	1032	0	46

Intersection Summary

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1116	72	0	980	0	44
Future Vol, veh/h	1116	72	0	980	0	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1175	76	0	1032	0	46

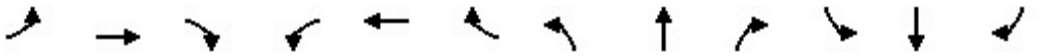
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	626
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	366
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	366
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	16.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	366	-	-	-
HCM Lane V/C Ratio	0.127	-	-	-
HCM Control Delay (s)	16.3	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.4	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.977	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5931	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5931	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			257			281			95		36	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



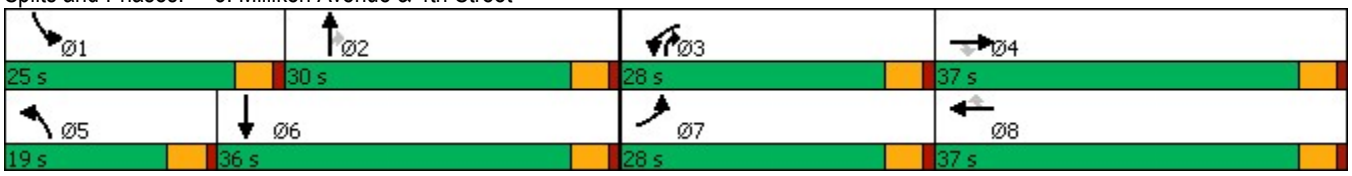
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	263	941	272	522	696	267	199	849	365	375	823	146
Future Volume (vph)	263	941	272	522	696	267	199	849	365	375	823	146
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	277	991	286	549	733	281	209	894	384	395	866	154
Shared Lane Traffic (%)												
Lane Group Flow (vph)	277	991	286	549	733	281	209	894	384	395	1020	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	263	941	272	522	696	267	199	849	365	375	823
Future Volume (vph)	263	941	272	522	696	267	199	849	365	375	823
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	28.0	37.0	37.0	28.0	37.0	37.0	19.0	30.0	28.0	25.0	36.0
Total Split (%)	23.3%	30.8%	30.8%	23.3%	30.8%	30.8%	15.8%	25.0%	23.3%	20.8%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	16.3	30.6	30.6	23.5	37.8	37.8	12.7	23.5	51.5	19.0	29.8
Actuated g/C Ratio	0.14	0.27	0.27	0.20	0.33	0.33	0.11	0.20	0.45	0.17	0.26
v/c Ratio	0.67	0.77	0.49	0.93	0.46	0.41	0.65	0.72	0.53	0.83	0.65
Control Delay	55.7	43.9	9.2	69.2	32.7	5.7	59.8	46.6	20.3	62.3	39.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.7	43.9	9.2	69.2	32.7	5.7	59.8	46.6	20.3	62.3	39.0
LOS	E	D	A	E	C	A	E	D	C	E	D
Approach Delay		39.6			40.7			41.7			45.5
Approach LOS		D			D			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 114.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 41.8	Intersection LOS: D
Intersection Capacity Utilization 77.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 5: Milliken Avenue & 4th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	277	991	286	549	733	281	209	894	384	395	1020
v/c Ratio	0.67	0.77	0.49	0.93	0.46	0.41	0.65	0.72	0.53	0.83	0.65
Control Delay	55.7	43.9	9.2	69.2	32.7	5.7	59.8	46.6	20.3	62.3	39.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.7	43.9	9.2	69.2	32.7	5.7	59.8	46.6	20.3	62.3	39.0
Queue Length 50th (ft)	106	258	17	219	164	0	80	187	158	153	196
Queue Length 95th (ft)	146	312	91	#332	217	65	121	226	254	#224	236
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	595	1372	611	595	1587	682	367	1357	727	519	1670
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.72	0.47	0.92	0.46	0.41	0.57	0.66	0.53	0.76	0.61

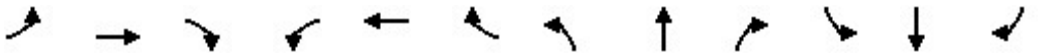
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	263	941	272	522	696	267	199	849	365	375	823	146
Future Volume (veh/h)	263	941	272	522	696	267	199	849	365	375	823	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	277	991	286	549	733	281	209	894	384	395	866	154
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	341	1234	383	596	1658	515	264	1365	644	452	1518	265
Arrive On Green	0.12	0.26	0.26	0.20	0.34	0.34	0.09	0.22	0.22	0.16	0.29	0.29
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	2910	6095	1502	2910	5260	918
Grp Volume(v), veh/h	277	991	286	549	733	281	209	894	384	395	751	269
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1455	1524	1502	1455	1524	1607
Q Serve(g_s), s	10.4	21.5	19.6	20.7	13.1	16.9	7.9	14.9	22.0	14.8	15.6	16.0
Cycle Q Clear(g_c), s	10.4	21.5	19.6	20.7	13.1	16.9	7.9	14.9	22.0	14.8	15.6	16.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.57
Lane Grp Cap(c), veh/h	341	1234	383	596	1658	515	264	1365	644	452	1319	464
V/C Ratio(X)	0.81	0.80	0.75	0.92	0.44	0.55	0.79	0.66	0.60	0.87	0.57	0.58
Avail Cap(c_a), veh/h	611	1406	436	611	1658	515	377	1390	650	533	1319	464
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.2	39.0	38.3	43.6	28.5	29.7	49.8	39.5	24.5	46.2	33.9	34.0
Incr Delay (d2), s/veh	4.7	3.1	6.0	19.3	0.2	1.2	7.3	1.1	1.5	13.3	0.6	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	8.8	7.8	9.0	5.1	6.2	3.1	5.7	7.9	6.2	5.8	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.9	42.1	44.4	62.9	28.7	30.9	57.1	40.6	26.0	59.4	34.4	35.8
LnGrp LOS	D	D	D	E	C	C	E	D	C	E	C	D
Approach Vol, veh/h		1554			1563			1487			1415	
Approach Delay, s/veh		44.4			41.1			39.1			41.7	
Approach LOS		D			D			D			D	

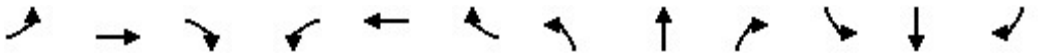
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.9	29.5	27.4	33.0	14.6	36.8	17.6	42.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	20.5	25.5	23.5	32.5	14.5	31.5	23.5	32.5
Max Q Clear Time (g_c+I1), s	16.8	24.0	22.7	23.5	9.9	18.0	12.4	18.9
Green Ext Time (p_c), s	0.5	1.1	0.2	5.1	0.3	5.8	0.7	5.2

Intersection Summary	
HCM 6th Ctrl Delay	41.6
HCM 6th LOS	D



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.945	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	3035	1365
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	3035	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			156			270			374		91	403
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



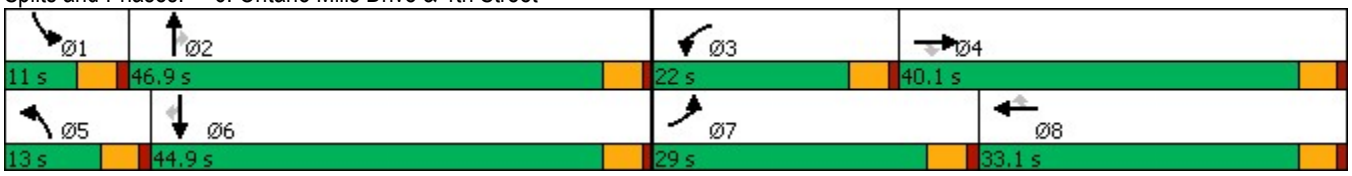
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	702	1087	150	394	871	404	175	306	469	65	607	782
Future Volume (vph)	702	1087	150	394	871	404	175	306	469	65	607	782
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	731	1132	156	410	907	421	182	319	489	68	632	815
Shared Lane Traffic (%)												45%
Lane Group Flow (vph)	731	1132	156	410	907	421	182	319	489	68	999	448

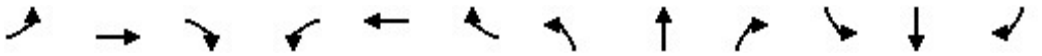
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	702	1087	150	394	871	404	175	306	469	65	607	782
Future Volume (vph)	702	1087	150	394	871	404	175	306	469	65	607	782
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	29.0	40.1	40.1	22.0	33.1	33.1	13.0	46.9	46.9	11.0	44.9	44.9
Total Split (%)	24.2%	33.4%	33.4%	18.3%	27.6%	27.6%	10.8%	39.1%	39.1%	9.2%	37.4%	37.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	24.5	34.8	34.8	17.5	27.8	27.8	8.5	41.7	41.7	6.5	39.7	39.7
Actuated g/C Ratio	0.21	0.29	0.29	0.15	0.23	0.23	0.07	0.35	0.35	0.05	0.33	0.33
v/c Ratio	1.22	0.80	0.28	0.96	0.80	0.75	1.61	0.27	0.64	0.79	0.93	0.62
Control Delay	155.5	43.8	6.3	85.8	49.1	24.3	344.8	28.4	11.7	107.5	49.8	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	155.5	43.8	6.3	85.8	49.1	24.3	344.8	28.4	11.7	107.5	49.8	8.8
LOS	F	D	A	F	D	C	F	C	B	F	D	A
Approach Delay		81.3			51.7			78.3			40.3	
Approach LOS		F			D			E			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 118.6	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.61	
Intersection Signal Delay: 62.7	Intersection LOS: E
Intersection Capacity Utilization 93.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 6: Ontario Mills Drive & 4th Street



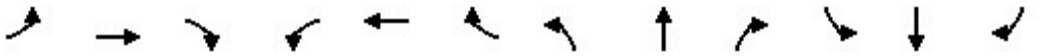


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	731	1132	156	410	907	421	182	319	489	68	999	448
v/c Ratio	1.22	0.80	0.28	0.96	0.80	0.75	1.61	0.27	0.64	0.79	0.93	0.62
Control Delay	155.5	43.8	6.3	85.8	49.1	24.3	344.8	28.4	11.7	107.5	49.8	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	155.5	43.8	6.3	85.8	49.1	24.3	344.8	28.4	11.7	107.5	49.8	8.8
Queue Length 50th (ft)	~362	295	0	164	242	109	~203	92	62	53	376	26
Queue Length 95th (ft)	#484	352	50	#267	295	239	#351	130	181	#137	#518	135
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	597	1447	559	426	1162	567	113	1199	776	86	1094	730
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.22	0.78	0.28	0.96	0.78	0.74	1.61	0.27	0.63	0.79	0.91	0.61

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



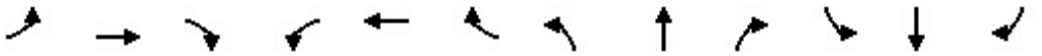
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	702	1087	150	394	871	404	175	306	469	65	607	782
Future Volume (veh/h)	702	1087	150	394	871	404	175	306	469	65	607	782
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	731	1132	156	410	907	421	182	319	489	68	632	815
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	594	1435	445	424	1153	358	113	1194	533	84	597	1011
Arrive On Green	0.20	0.30	0.30	0.15	0.24	0.24	0.07	0.35	0.35	0.05	0.34	0.34
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	1594	3367	1502	1594	1772	3003
Grp Volume(v), veh/h	731	1132	156	410	907	421	182	319	489	68	632	815
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1594	1683	1502	1594	1772	1502
Q Serve(g_s), s	24.5	25.8	9.8	16.8	21.1	28.6	8.5	8.1	37.4	5.1	40.4	29.6
Cycle Q Clear(g_c), s	24.5	25.8	9.8	16.8	21.1	28.6	8.5	8.1	37.4	5.1	40.4	29.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	594	1435	445	424	1153	358	113	1194	533	84	597	1011
V/C Ratio(X)	1.23	0.79	0.35	0.97	0.79	1.18	1.61	0.27	0.92	0.81	1.06	0.81
Avail Cap(c_a), veh/h	594	1435	445	424	1153	358	113	1194	533	86	597	1011
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.8	38.7	33.1	51.0	42.8	45.7	55.8	27.6	37.0	56.2	39.8	36.2
Incr Delay (d2), s/veh	117.9	3.0	0.5	34.8	3.7	104.8	312.5	0.1	21.0	40.9	53.6	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.5	10.5	3.6	8.2	8.8	21.0	13.2	3.3	16.6	3.0	26.2	11.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	165.6	41.8	33.6	85.8	46.5	150.5	368.2	27.7	58.1	97.1	93.4	41.1
LnGrp LOS	F	D	C	F	D	F	F	C	E	F	F	D
Approach Vol, veh/h		2019			1738			990			1515	
Approach Delay, s/veh		86.0			81.0			105.3			65.4	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.8	47.1	22.0	40.1	13.0	44.9	29.0	33.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	42.4	17.5	35.6	8.5	40.4	24.5	28.6
Max Q Clear Time (g_c+I1), s	7.1	39.4	18.8	27.8	10.5	42.4	26.5	30.6
Green Ext Time (p_c), s	0.0	1.2	0.0	4.8	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	82.7
HCM 6th LOS	F

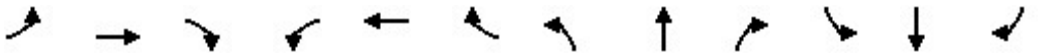
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.982			0.938				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.996	
Satd. Flow (prot)	2891	4818	1500	1583	4731	0	1583	3145	0	1504	1670	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.996	
Satd. Flow (perm)	2891	4818	1500	1583	4731	0	1583	3145	0	1504	1670	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95		17			48				442
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



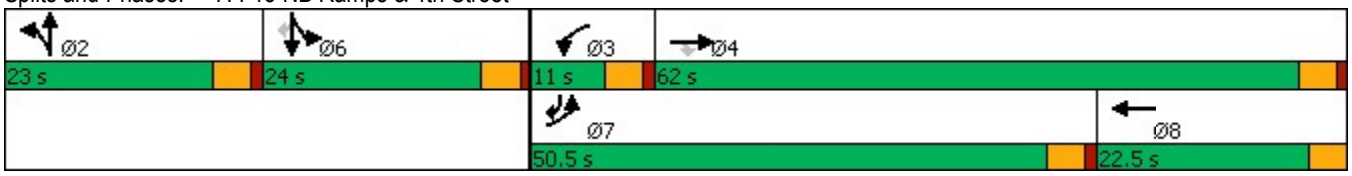
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1011	483	89	31	513	70	91	65	45	68	73	1090
Future Volume (vph)	1011	483	89	31	513	70	91	65	45	68	73	1090
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1076	514	95	33	546	74	97	69	48	72	78	1160
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	1076	514	95	33	620	0	97	117	0	65	85	1160

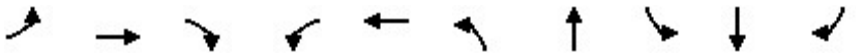
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	1011	483	89	31	513	91	65	68	73	1090
Future Volume (vph)	1011	483	89	31	513	91	65	68	73	1090
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	50.5	62.0	62.0	11.0	22.5	23.0	23.0	24.0	24.0	50.5
Total Split (%)	42.1%	51.7%	51.7%	9.2%	18.8%	19.2%	19.2%	20.0%	20.0%	42.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	44.7	59.7	59.7	6.3	17.6	11.6	11.6	10.6	10.6	59.9
Actuated g/C Ratio	0.44	0.59	0.59	0.06	0.17	0.11	0.11	0.10	0.10	0.59
v/c Ratio	0.85	0.18	0.10	0.34	0.75	0.54	0.29	0.42	0.49	0.67
Control Delay	34.5	11.7	3.3	59.3	46.1	55.5	28.2	53.0	54.8	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.5	11.7	3.3	59.3	46.1	55.5	28.2	53.0	54.8	10.7
LOS	C	B	A	E	D	E	C	D	D	B
Approach Delay		25.8			46.8		40.6		15.7	
Approach LOS		C			D		D		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 101.8	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 26.7	Intersection LOS: C
Intersection Capacity Utilization 69.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street

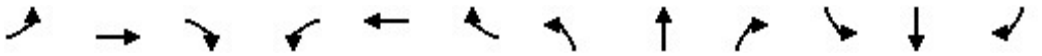




Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1076	514	95	33	620	97	117	65	85	1160
v/c Ratio	0.85	0.18	0.10	0.34	0.75	0.54	0.29	0.42	0.49	0.67
Control Delay	34.5	11.7	3.3	59.3	46.1	55.5	28.2	53.0	54.8	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.5	11.7	3.3	59.3	46.1	55.5	28.2	53.0	54.8	10.7
Queue Length 50th (ft)	321	59	0	22	139	62	22	43	57	169
Queue Length 95th (ft)	#523	98	27	57	203	120	51	92	114	278
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	1322	2846	925	102	907	291	617	291	323	1774
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.18	0.10	0.32	0.68	0.33	0.19	0.22	0.26	0.65

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1011	483	89	31	513	70	91	65	45	68	73	1090
Future Volume (veh/h)	1011	483	89	31	513	70	91	65	45	68	73	1090
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	1076	514	95	33	546	74	97	69	48	72	78	1160
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1160	2547	791	47	680	91	135	166	106	298	331	1759
Arrive On Green	0.40	0.53	0.53	0.03	0.16	0.16	0.08	0.08	0.08	0.19	0.19	0.19
Sat Flow, veh/h	2910	4837	1502	1594	4316	577	1594	1973	1257	1594	1772	3003
Grp Volume(v), veh/h	1076	514	95	33	406	214	97	58	59	72	78	1160
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1594	1612	1668	1594	1683	1546	1594	1772	1502
Q Serve(g_s), s	36.8	5.9	3.3	2.1	12.7	12.9	6.2	3.4	3.8	4.0	3.9	19.5
Cycle Q Clear(g_c), s	36.8	5.9	3.3	2.1	12.7	12.9	6.2	3.4	3.8	4.0	3.9	19.5
Prop In Lane	1.00		1.00	1.00		0.35	1.00		0.81	1.00		1.00
Lane Grp Cap(c), veh/h	1160	2547	791	47	508	263	135	142	130	298	331	1759
V/C Ratio(X)	0.93	0.20	0.12	0.70	0.80	0.82	0.72	0.41	0.45	0.24	0.24	0.66
Avail Cap(c_a), veh/h	1283	2667	828	99	587	304	283	299	274	298	331	1759
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.9	13.1	12.5	50.2	42.4	42.5	46.6	45.3	45.5	36.1	36.1	14.6
Incr Delay (d2), s/veh	11.1	0.0	0.1	17.2	6.8	13.9	7.1	1.9	2.4	0.4	0.4	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.2	2.1	1.1	1.1	5.5	6.3	2.7	1.5	1.5	1.6	1.7	8.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.0	13.1	12.5	67.4	49.1	56.4	53.6	47.1	47.9	36.5	36.4	15.5
LnGrp LOS	D	B	B	E	D	E	D	D	D	D	D	B
Approach Vol, veh/h		1685			653			214			1310	
Approach Delay, s/veh		30.9			52.4			50.3			17.9	
Approach LOS		C			D			D			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		13.3	7.6	59.4		24.0	46.1	20.9				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		18.5	6.5	57.5		19.5	46.0	* 19				
Max Q Clear Time (g_c+I1), s		8.2	4.1	7.9		21.5	38.8	14.9				
Green Ext Time (p_c), s		0.6	0.0	4.4		0.0	2.8	1.5				

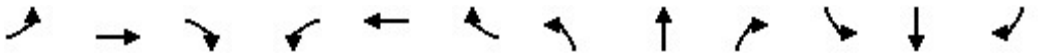
Intersection Summary	
HCM 6th Ctrl Delay	31.2
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

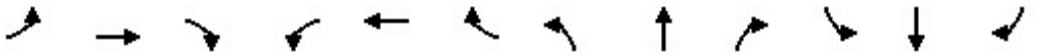
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

User approved changes to right turn type.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.903				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3028	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3028	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		48				236			236			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



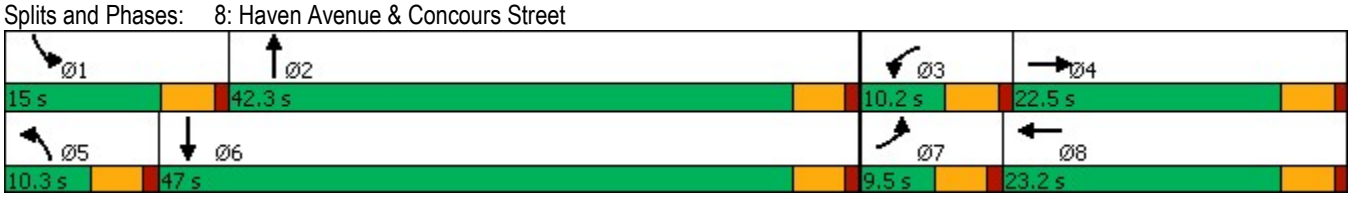
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	12	24	45	121	52	58	43	1538	222	41	1460	30
Future Volume (vph)	12	24	45	121	52	58	43	1538	222	41	1460	30
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	13	26	48	129	55	62	46	1636	236	44	1553	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	74	0	129	55	62	46	1636	236	44	1553	32

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	12	24	121	52	58	43	1538	222	41	1460	30
Future Volume (vph)	12	24	121	52	58	43	1538	222	41	1460	30
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	10.2	23.2		10.3	42.3		15.0	47.0	
Total Split (%)	10.6%	25.0%	11.3%	25.8%		11.4%	47.0%		16.7%	52.2%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.4	6.7	6.2	12.8	63.0	6.2	37.9	63.0	6.9	38.6	63.0
Actuated g/C Ratio	0.09	0.11	0.10	0.20	1.00	0.10	0.60	1.00	0.11	0.61	1.00
v/c Ratio	0.05	0.20	0.34	0.08	0.04	0.16	0.45	0.16	0.14	0.42	0.02
Control Delay	34.5	17.7	34.8	26.4	0.1	34.0	11.0	0.2	32.2	10.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.5	17.7	34.8	26.4	0.1	34.0	11.0	0.2	32.2	10.1	0.0
LOS	C	B	C	C	A	C	B	A	C	B	A
Approach Delay		20.2		24.2			10.2			10.5	
Approach LOS		C		C			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 63	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 11.4	Intersection LOS: B
Intersection Capacity Utilization 40.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	13	74	129	55	62	46	1636	236	44	1553	32
v/c Ratio	0.05	0.20	0.34	0.08	0.04	0.16	0.45	0.16	0.14	0.42	0.02
Control Delay	34.5	17.7	34.8	26.4	0.1	34.0	11.0	0.2	32.2	10.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.5	17.7	34.8	26.4	0.1	34.0	11.0	0.2	32.2	10.1	0.0
Queue Length 50th (ft)	2	5	19	10	0	9	136	0	9	125	0
Queue Length 95th (ft)	11	25	40	30	0	27	184	0	25	161	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	248	969	385	1077	1500	288	3977	1500	521	4280	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.08	0.34	0.05	0.04	0.16	0.41	0.16	0.08	0.36	0.02

Intersection Summary

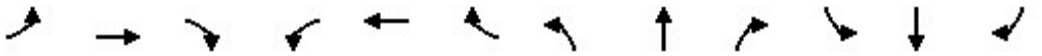
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	24	45	121	52	58	43	1538	222	41	1460	30
Future Volume (veh/h)	12	24	45	121	52	58	43	1538	222	41	1460	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	13	26	48	129	55	0	46	1636	0	44	1553	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	48	134	119	306	472		133	2917		129	2908	
Arrive On Green	0.02	0.08	0.08	0.08	0.14	0.00	0.05	0.48	0.00	0.04	0.48	0.00
Sat Flow, veh/h	2910	1683	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	13	26	48	129	55	0	46	1636	0	44	1553	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	0.2	0.8	1.7	1.7	0.8	0.0	0.9	10.7	0.0	0.8	10.0	0.0
Cycle Q Clear(g_c), s	0.2	0.8	1.7	1.7	0.8	0.0	0.9	10.7	0.0	0.8	10.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	48	134	119	306	472		133	2917		129	2908	
V/C Ratio(X)	0.27	0.19	0.40	0.42	0.12		0.35	0.56		0.34	0.53	
Avail Cap(c_a), veh/h	259	540	482	403	1122		301	4105		544	4616	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.3	24.2	24.6	24.7	21.1	0.0	26.0	10.4	0.0	26.0	10.3	0.0
Incr Delay (d2), s/veh	3.0	0.7	2.2	0.9	0.1	0.0	1.5	0.2	0.0	1.6	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.3	0.6	0.5	0.3	0.0	0.3	3.0	0.0	0.3	2.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.3	24.9	26.8	25.6	21.2	0.0	27.5	10.6	0.0	27.6	10.4	0.0
LnGrp LOS	C	C	C	C	C		C	B		C	B	
Approach Vol, veh/h		87			184	A		1682	A		1597	A
Approach Delay, s/veh		26.7			24.3			11.1			10.9	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	31.4	8.8	9.0	7.1	31.3	5.4	12.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	37.8	5.7	18.0	5.8	42.5	5.0	18.7
Max Q Clear Time (g_c+I1), s	2.8	12.7	3.7	3.7	2.9	12.0	2.2	2.8
Green Ext Time (p_c), s	0.0	14.1	0.1	0.2	0.0	14.7	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	12.1
HCM 6th LOS	B

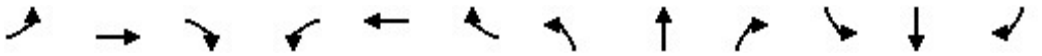
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.995									0.935	
Flt Protected	0.950	0.954					0.950					
Satd. Flow (prot)	1593	1591	0	0	1765	0	1676	4818	0	1765	4505	0
Flt Permitted	0.950	0.954					0.950					
Satd. Flow (perm)	1593	1591	0	0	1765	0	1676	4818	0	1765	4505	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		143						1			183	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



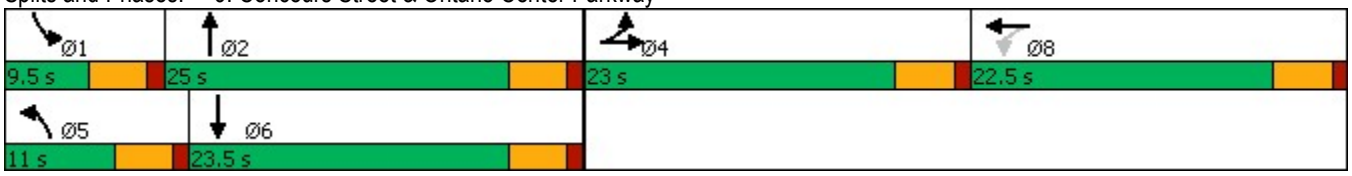
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	157	0	3	0	0	0	35	291	1	0	217	165
Future Volume (vph)	157	0	3	0	0	0	35	291	1	0	217	165
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	174	0	3	0	0	0	39	323	1	0	241	183
Shared Lane Traffic (%)	49%											
Lane Group Flow (vph)	89	88	0	0	0	0	39	324	0	0	424	0

Intersection Summary

Lane Group	EBL	EBT	NBL	NBT	SBT	Ø1	Ø8
Lane Configurations							
Traffic Volume (vph)	157	0	35	291	217		
Future Volume (vph)	157	0	35	291	217		
Turn Type	Split	NA	Prot	NA	NA		
Protected Phases	4	4	5	2	6	1	8
Permitted Phases							
Detector Phase	4	4	5	2	6		
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	9.5	22.5
Total Split (s)	23.0	23.0	11.0	25.0	23.5	9.5	22.5
Total Split (%)	28.8%	28.8%	13.8%	31.3%	29.4%	12%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		
Lead/Lag			Lead	Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	Min	Min	None	None
Act Effct Green (s)	7.6	7.6	6.3	16.2	14.5		
Actuated g/C Ratio	0.26	0.26	0.21	0.55	0.49		
v/c Ratio	0.22	0.17	0.11	0.12	0.18		
Control Delay	11.0	2.2	12.0	5.0	4.9		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	11.0	2.2	12.0	5.0	4.9		
LOS	B	A	B	A	A		
Approach Delay		6.7		5.8	4.9		
Approach LOS		A		A	A		

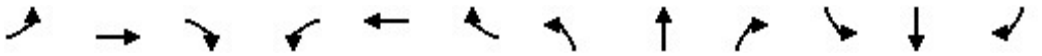
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 29.6	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.22	
Intersection Signal Delay: 5.6	Intersection LOS: A
Intersection Capacity Utilization 28.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	NBL	NBT	SBT
Lane Group Flow (vph)	89	88	39	324	424
v/c Ratio	0.22	0.17	0.11	0.12	0.18
Control Delay	11.0	2.2	12.0	5.0	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.0	2.2	12.0	5.0	4.9
Queue Length 50th (ft)	8	0	4	9	6
Queue Length 95th (ft)	43	12	25	19	32
Internal Link Dist (ft)		319		111	176
Turn Bay Length (ft)	170		115		
Base Capacity (vph)	1027	1077	380	3643	3259
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.09	0.08	0.10	0.09	0.13

Intersection Summary



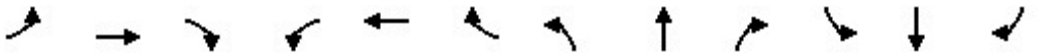
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	0	3	0	0	0	35	291	1	0	217	165
Future Volume (veh/h)	157	0	3	0	0	0	35	291	1	0	217	165
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	177	0	0	0	0	0	39	323	1	0	241	183
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	477	250	0	0	7	0	80	2491	8	7	883	411
Arrive On Green	0.14	0.00	0.00	0.00	0.00	0.00	0.05	0.50	0.50	0.00	0.27	0.27
Sat Flow, veh/h	3375	1772	0	0	1772	0	1688	4979	15	1688	3225	1502
Grp Volume(v), veh/h	177	0	0	0	0	0	39	209	115	0	241	183
Grp Sat Flow(s),veh/h/ln	1688	1772	0	0	1772	0	1688	1612	1769	1688	1612	1502
Q Serve(g_s), s	1.2	0.0	0.0	0.0	0.0	0.0	0.6	0.9	0.9	0.0	1.5	2.5
Cycle Q Clear(g_c), s	1.2	0.0	0.0	0.0	0.0	0.0	0.6	0.9	0.9	0.0	1.5	2.5
Prop In Lane	1.00		0.00	0.00		0.00	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	477	250	0	0	7	0	80	1614	885	7	883	411
V/C Ratio(X)	0.37	0.00	0.00	0.00	0.00	0.00	0.49	0.13	0.13	0.00	0.27	0.45
Avail Cap(c_a), veh/h	2487	1305	0	0	1270	0	437	2633	1444	336	2440	1136
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	9.8	0.0	0.0	0.0	0.0	0.0	11.7	3.4	3.4	0.0	7.2	7.5
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.1	0.0	0.2	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.1	0.0	0.3	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.3	0.0	0.0	0.0	0.0	0.0	16.2	3.4	3.4	0.0	7.3	8.3
LnGrp LOS	B	A	A	A	A	A	B	A	A	A	A	A
Approach Vol, veh/h		177			0			363			424	
Approach Delay, s/veh		10.3			0.0			4.8			7.7	
Approach LOS		B						A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	17.1		8.0	5.7	11.4		0.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	20.5		18.5	6.5	19.0		18.0				
Max Q Clear Time (g_c+I1), s	0.0	2.9		3.2	2.6	4.5		0.0				
Green Ext Time (p_c), s	0.0	1.8		0.5	0.0	2.3		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		7.1
HCM 6th LOS		A

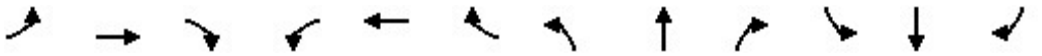
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			297			182			215			285
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



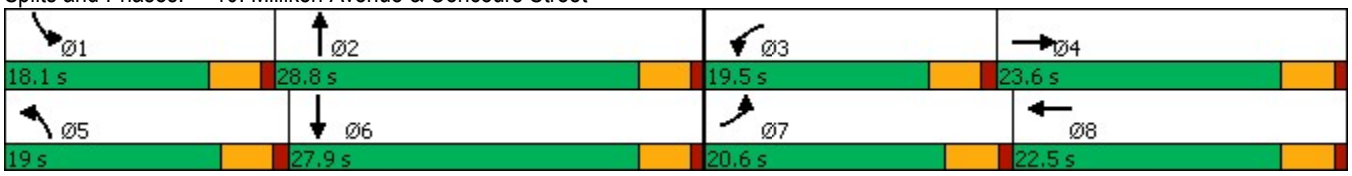
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	334	150	276	251	98	155	319	961	234	270	965	271
Future Volume (vph)	334	150	276	251	98	155	319	961	234	270	965	271
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	359	161	297	270	105	167	343	1033	252	290	1038	291
Shared Lane Traffic (%)												
Lane Group Flow (vph)	359	161	297	270	105	167	343	1033	252	290	1038	291

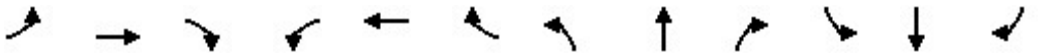
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	334	150	276	251	98	155	319	961	234	270	965	271
Future Volume (vph)	334	150	276	251	98	155	319	961	234	270	965	271
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	20.6	23.6		19.5	22.5		19.0	28.8		18.1	27.9	
Total Split (%)	22.9%	26.2%		21.7%	25.0%		21.1%	32.0%		20.1%	31.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	16.2	9.5	73.8	12.0	7.9	73.8	13.1	22.0	73.8	12.0	20.8	73.8
Actuated g/C Ratio	0.22	0.13	1.00	0.16	0.11	1.00	0.18	0.30	1.00	0.16	0.28	1.00
v/c Ratio	0.56	0.37	0.20	0.57	0.29	0.11	0.67	0.57	0.17	0.62	0.61	0.19
Control Delay	32.0	33.6	0.3	34.8	34.6	0.1	36.7	23.9	0.2	36.4	25.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.0	33.6	0.3	34.8	34.6	0.1	36.7	23.9	0.2	36.4	25.2	0.3
LOS	C	C	A	C	C	A	D	C	A	D	C	A
Approach Delay		20.8			24.1			23.0			22.7	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 73.8	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 22.6	Intersection LOS: C
Intersection Capacity Utilization 56.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Milliken Avenue & Concours Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	359	161	297	270	105	167	343	1033	252	290	1038	291
v/c Ratio	0.56	0.37	0.20	0.57	0.29	0.11	0.67	0.57	0.17	0.62	0.61	0.19
Control Delay	32.0	33.6	0.3	34.8	34.6	0.1	36.7	23.9	0.2	36.4	25.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.0	33.6	0.3	34.8	34.6	0.1	36.7	23.9	0.2	36.4	25.2	0.3
Queue Length 50th (ft)	83	38	0	63	25	0	79	120	0	68	124	0
Queue Length 95th (ft)	134	69	0	103	49	0	130	165	0	113	169	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	673	882	1500	597	831	1500	577	2033	1500	542	1957	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.18	0.20	0.45	0.13	0.11	0.59	0.51	0.17	0.54	0.53	0.19

Intersection Summary

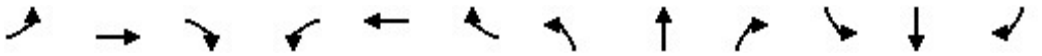
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	334	150	276	251	98	155	319	961	234	270	965	271
Future Volume (veh/h)	334	150	276	251	98	155	319	961	234	270	965	271
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	359	161	0	270	105	0	343	1033	0	290	1038	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	479	402		382	289		458	1844		400	1723	
Arrive On Green	0.16	0.12	0.00	0.13	0.09	0.00	0.16	0.30	0.00	0.14	0.28	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	359	161	0	270	105	0	343	1033	0	290	1038	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	6.8	2.6	0.0	5.2	1.7	0.0	6.6	8.3	0.0	5.6	8.6	0.0
Cycle Q Clear(g_c), s	6.8	2.6	0.0	5.2	1.7	0.0	6.6	8.3	0.0	5.6	8.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	479	402		382	289		458	1844		400	1723	
V/C Ratio(X)	0.75	0.40		0.71	0.36		0.75	0.56		0.72	0.60	
Avail Cap(c_a), veh/h	805	1105		750	1041		725	2545		680	2451	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.2	23.7	0.0	24.2	25.1	0.0	23.4	17.0	0.0	24.0	18.0	0.0
Incr Delay (d2), s/veh	2.4	0.6	0.0	2.4	0.8	0.0	2.5	0.3	0.0	2.5	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	1.0	0.0	1.8	0.7	0.0	2.2	2.6	0.0	1.9	2.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.5	24.3	0.0	26.6	25.9	0.0	25.9	17.3	0.0	26.5	18.4	0.0
LnGrp LOS	C	C		C	C		C	B		C	B	
Approach Vol, veh/h		520	A		375	A		1376	A		1328	A
Approach Delay, s/veh		25.2			26.4			19.5			20.2	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.5	22.1	12.1	11.4	13.7	21.0	14.1	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.6	24.3	15.0	19.1	14.5	23.4	16.1	18.0
Max Q Clear Time (g_c+I1), s	7.6	10.3	7.2	4.6	8.6	10.6	8.8	3.7
Green Ext Time (p_c), s	0.5	6.2	0.6	0.7	0.6	5.9	0.8	0.4

Intersection Summary	
HCM 6th Ctrl Delay	21.3
HCM 6th LOS	C

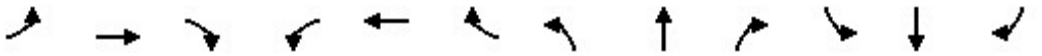
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			182			463			182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



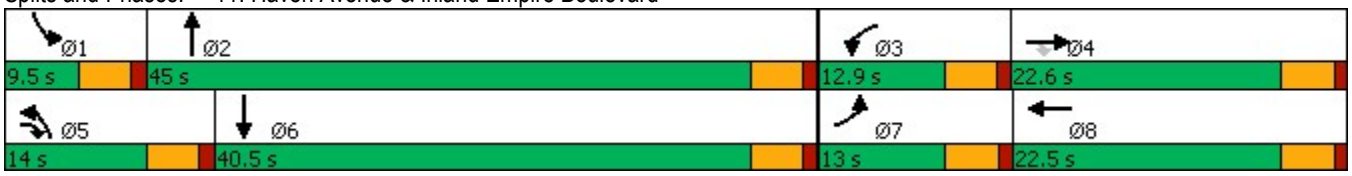
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	69	121	252	182	119	68	163	1662	548	53	1463	45
Future Volume (vph)	69	121	252	182	119	68	163	1662	548	53	1463	45
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	71	125	260	188	123	70	168	1713	565	55	1508	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	125	260	188	123	70	168	1713	565	55	1508	46

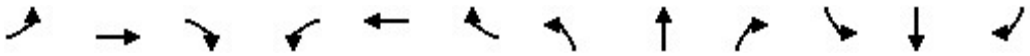
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	121	252	182	119	68	163	1662	548	53	1463	45
Future Volume (vph)	69	121	252	182	119	68	163	1662	548	53	1463	45
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	13.0	22.6	14.0	12.9	22.5		14.0	45.0		9.5	40.5	
Total Split (%)	14.4%	25.1%	15.6%	14.3%	25.0%		15.6%	50.0%		10.6%	45.0%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	7.2	8.3	18.8	8.2	9.1	72.6	8.9	40.1	72.6	5.2	31.7	72.6
Actuated g/C Ratio	0.10	0.11	0.26	0.11	0.13	1.00	0.12	0.55	1.00	0.07	0.44	1.00
v/c Ratio	0.25	0.32	0.59	0.43	0.29	0.05	0.48	0.51	0.38	0.27	0.57	0.03
Control Delay	35.8	34.9	22.8	36.2	34.0	0.1	37.5	12.5	0.7	39.5	16.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	34.9	22.8	36.2	34.0	0.1	37.5	12.5	0.7	39.5	16.9	0.0
LOS	D	C	C	D	C	A	D	B	A	D	B	A
Approach Delay		28.2			28.8			11.5			17.2	
Approach LOS		C			C			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 72.6	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 16.3	Intersection LOS: B
Intersection Capacity Utilization 54.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	71	125	260	188	123	70	168	1713	565	55	1508	46
v/c Ratio	0.25	0.32	0.59	0.43	0.29	0.05	0.48	0.51	0.38	0.27	0.57	0.03
Control Delay	35.8	34.9	22.8	36.2	34.0	0.1	37.5	12.5	0.7	39.5	16.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	34.9	22.8	36.2	34.0	0.1	37.5	12.5	0.7	39.5	16.9	0.0
Queue Length 50th (ft)	17	30	76	31	29	0	40	162	0	13	154	0
Queue Length 95th (ft)	37	56	152	54	56	0	73	208	0	32	199	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	351	867	461	473	862	1500	392	3539	1500	206	3123	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.14	0.56	0.40	0.14	0.05	0.43	0.48	0.38	0.27	0.48	0.03

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	121	252	182	119	68	163	1662	548	53	1463	45
Future Volume (veh/h)	69	121	252	182	119	68	163	1662	548	53	1463	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	71	125	260	188	123	0	168	1713	0	55	1508	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	153	642	411	295	715		242	2680		135	2456	
Arrive On Green	0.05	0.19	0.19	0.07	0.21	0.00	0.08	0.44	0.00	0.05	0.40	0.00
Sat Flow, veh/h	2910	3367	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	71	125	260	188	123	0	168	1713	0	55	1508	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	1.7	2.3	11.0	3.3	2.2	0.0	4.1	15.8	0.0	1.3	14.2	0.0
Cycle Q Clear(g_c), s	1.7	2.3	11.0	3.3	2.2	0.0	4.1	15.8	0.0	1.3	14.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	153	642	411	295	715		242	2680		135	2456	
V/C Ratio(X)	0.46	0.19	0.63	0.64	0.17		0.69	0.64		0.41	0.61	
Avail Cap(c_a), veh/h	342	843	501	461	838		383	3416		201	3036	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.3	24.6	23.1	32.5	23.3	0.0	32.2	15.8	0.0	33.5	17.1	0.0
Incr Delay (d2), s/veh	2.2	0.1	1.8	2.3	0.1	0.0	3.6	0.3	0.0	2.0	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.9	3.9	1.1	0.8	0.0	1.5	5.0	0.0	0.5	4.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.4	24.7	24.9	34.8	23.4	0.0	35.8	16.0	0.0	35.5	17.4	0.0
LnGrp LOS	D	C	C	C	C		D	B		D	B	
Approach Vol, veh/h		456			311	A		1881	A		1563	A
Approach Delay, s/veh		26.5			30.3			17.8			18.0	
Approach LOS		C			C			B			B	

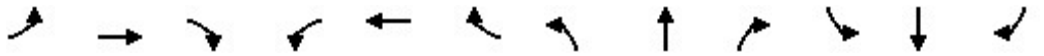
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	36.3	9.9	18.3	10.5	33.6	8.3	19.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	40.5	8.4	18.1	9.5	36.0	8.5	18.0
Max Q Clear Time (g_c+I1), s	3.3	17.8	5.3	13.0	6.1	16.2	3.7	4.2
Green Ext Time (p_c), s	0.0	14.0	0.2	0.8	0.2	11.2	0.1	0.5

Intersection Summary	
HCM 6th Ctrl Delay	19.7
HCM 6th LOS	B

Notes

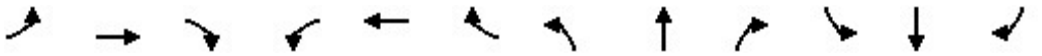
User approved changes to right turn type.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			270			193			551			193
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



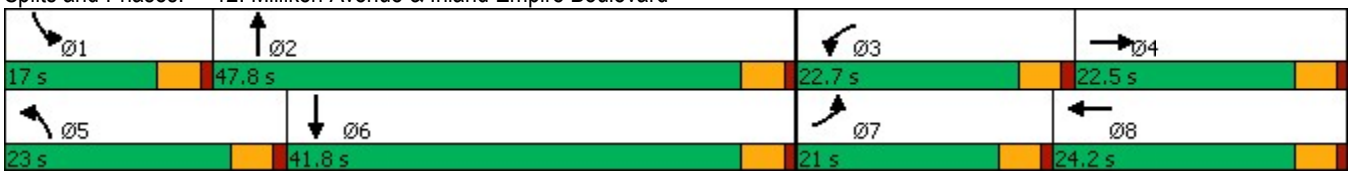
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	172	286	262	346	134	131	335	1155	763	137	1364	108
Future Volume (vph)	172	286	262	346	134	131	335	1155	763	137	1364	108
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	177	295	270	357	138	135	345	1191	787	141	1406	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	177	295	270	357	138	135	345	1191	787	141	1406	111

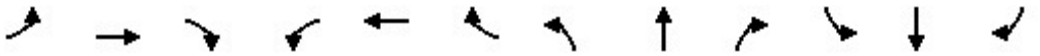
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	286	262	346	134	131	335	1155	763	137	1364	108
Future Volume (vph)	172	286	262	346	134	131	335	1155	763	137	1364	108
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	21.0	22.5		22.7	24.2		23.0	47.8		17.0	41.8	
Total Split (%)	19.1%	20.5%		20.6%	22.0%		20.9%	43.5%		15.5%	38.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	11.5	14.0	98.0	16.2	18.7	98.0	16.0	39.4	98.0	10.1	33.4	98.0
Actuated g/C Ratio	0.12	0.14	1.00	0.17	0.19	1.00	0.16	0.40	1.00	0.10	0.34	1.00
v/c Ratio	0.52	0.62	0.18	0.75	0.22	0.09	0.73	0.49	0.52	0.48	0.68	0.07
Control Delay	48.4	47.0	0.3	51.1	36.6	0.1	50.4	23.1	1.3	49.5	30.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.4	47.0	0.3	51.1	36.6	0.1	50.4	23.1	1.3	49.5	30.2	0.1
LOS	D	D	A	D	D	A	D	C	A	D	C	A
Approach Delay		30.3			37.0			19.8			29.8	
Approach LOS		C			D			B			C	

Intersection Summary		
Cycle Length: 110		
Actuated Cycle Length: 98		
Natural Cycle: 80		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.75		
Intersection Signal Delay: 26.4	Intersection LOS: C	
Intersection Capacity Utilization 67.3%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	177	295	270	357	138	135	345	1191	787	141	1406	111
v/c Ratio	0.52	0.62	0.18	0.75	0.22	0.09	0.73	0.49	0.52	0.48	0.68	0.07
Control Delay	48.4	47.0	0.3	51.1	36.6	0.1	50.4	23.1	1.3	49.5	30.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.4	47.0	0.3	51.1	36.6	0.1	50.4	23.1	1.3	49.5	30.2	0.1
Queue Length 50th (ft)	59	100	0	118	41	0	114	165	0	47	230	0
Queue Length 95th (ft)	94	147	0	#179	73	0	171	215	0	80	288	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	497	629	1500	549	711	1500	557	2758	1500	376	2362	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.47	0.18	0.65	0.19	0.09	0.62	0.43	0.52	0.38	0.60	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	172	286	262	346	134	131	335	1155	763	137	1364	108
Future Volume (veh/h)	172	286	262	346	134	131	335	1155	763	137	1364	108
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	177	295	0	357	138	0	345	1191	0	141	1406	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	253	418		444	639		433	2601		208	2131	
Arrive On Green	0.09	0.12	0.00	0.15	0.19	0.00	0.15	0.43	0.00	0.07	0.35	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	177	295	0	357	138	0	345	1191	0	141	1406	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	4.7	6.7	0.0	9.5	2.8	0.0	9.2	11.1	0.0	3.8	15.6	0.0
Cycle Q Clear(g_c), s	4.7	6.7	0.0	9.5	2.8	0.0	9.2	11.1	0.0	3.8	15.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	253	418		444	639		433	2601		208	2131	
V/C Ratio(X)	0.70	0.71		0.80	0.22		0.80	0.46		0.68	0.66	
Avail Cap(c_a), veh/h	600	757		662	829		673	3299		455	2842	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.5	33.6	0.0	32.7	27.4	0.0	32.9	16.3	0.0	36.2	22.0	0.0
Incr Delay (d2), s/veh	3.5	2.2	0.0	4.4	0.2	0.0	3.7	0.1	0.0	3.8	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	2.8	0.0	3.5	1.1	0.0	3.4	3.7	0.0	1.4	5.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.0	35.8	0.0	37.1	27.6	0.0	36.6	16.5	0.0	40.0	22.4	0.0
LnGrp LOS	D	D		D	C		D	B		D	C	
Approach Vol, veh/h		472	A		495	A		1536	A		1547	A
Approach Delay, s/veh		37.0			34.5			21.0			24.0	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	38.6	16.7	14.4	16.4	32.5	11.5	19.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	43.3	18.2	18.0	18.5	37.3	16.5	19.7
Max Q Clear Time (g_c+I1), s	5.8	13.1	11.5	8.7	11.2	17.6	6.7	4.8
Green Ext Time (p_c), s	0.2	10.4	0.7	1.2	0.7	10.4	0.4	0.6

Intersection Summary	
HCM 6th Ctrl Delay	25.6
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.925	0.850				
Flt Protected	0.976					
Satd. Flow (prot)	2919	1365	6071	0	0	6071
Flt Permitted	0.976					
Satd. Flow (perm)	2919	1365	6071	0	0	6071
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	7	7				
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

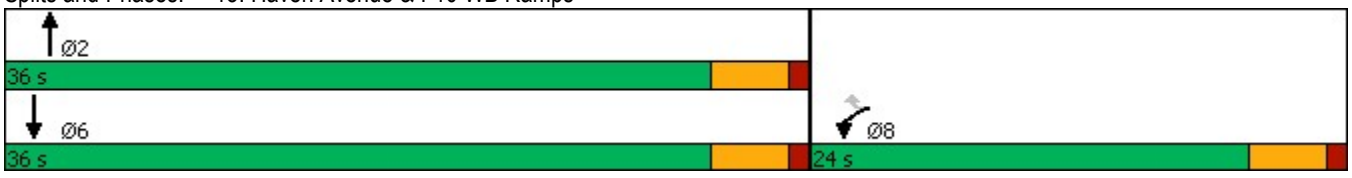
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	233	465	1871	0	0	1247
Future Volume (vph)	233	465	1871	0	0	1247
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.98	0.98	0.98	0.92	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	238	474	1909	0	0	1272
Shared Lane Traffic (%)		50%				
Lane Group Flow (vph)	475	237	1909	0	0	1272

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	233	465	1871	1247
Future Volume (vph)	233	465	1871	1247
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	36.0	36.0
Total Split (%)	40.0%	40.0%	60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	14.5	14.5	30.1	30.1
Actuated g/C Ratio	0.27	0.27	0.56	0.56
v/c Ratio	0.60	0.63	0.56	0.37
Control Delay	20.4	25.4	8.9	7.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.4	25.4	8.9	7.4
LOS	C	C	A	A
Approach Delay	22.0		8.9	7.4
Approach LOS	C		A	A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 53.8	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 10.8	Intersection LOS: B
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps



Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	475	237	1909	1272
v/c Ratio	0.60	0.63	0.56	0.37
Control Delay	20.4	25.4	8.9	7.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.4	25.4	8.9	7.4
Queue Length 50th (ft)	69	72	102	59
Queue Length 95th (ft)	107	140	159	94
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	1078	506	3608	3608
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.44	0.47	0.53	0.35

Intersection Summary

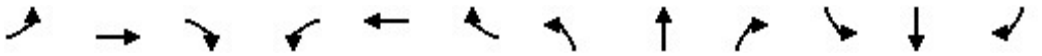
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	233	465	1871	0	0	1247
Future Volume (veh/h)	233	465	1871	0	0	1247
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1673	1772	1772	0	0	1772
Adj Flow Rate, veh/h	237	475	1909	0	0	1272
Peak Hour Factor	0.98	0.98	0.98	0.92	0.98	0.98
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	377	710	3439	0	0	3439
Arrive On Green	0.24	0.24	0.56	0.00	0.00	0.56
Sat Flow, veh/h	1594	3003	6592	0	0	6592
Grp Volume(v), veh/h	237	475	1909	0	0	1272
Grp Sat Flow(s),veh/h/ln	1594	1502	1524	0	0	1524
Q Serve(g_s), s	6.0	6.5	9.0	0.0	0.0	5.2
Cycle Q Clear(g_c), s	6.0	6.5	9.0	0.0	0.0	5.2
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	377	710	3439	0	0	3439
V/C Ratio(X)	0.63	0.67	0.56	0.00	0.00	0.37
Avail Cap(c_a), veh/h	689	1298	4256	0	0	4256
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	15.5	15.6	6.2	0.0	0.0	5.4
Incr Delay (d2), s/veh	1.7	1.1	0.1	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	2.0	1.8	0.0	0.0	1.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.2	16.7	6.4	0.0	0.0	5.5
LnGrp LOS	B	B	A	A	A	A
Approach Vol, veh/h	712		1909			1272
Approach Delay, s/veh	16.9		6.4			5.5
Approach LOS	B		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		29.9			29.9	15.2
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		31.5			31.5	19.5
Max Q Clear Time (g_c+I1), s		11.0			7.2	8.5
Green Ext Time (p_c), s		14.5			10.3	2.2

Intersection Summary	
HCM 6th Ctrl Delay	8.0
HCM 6th LOS	A

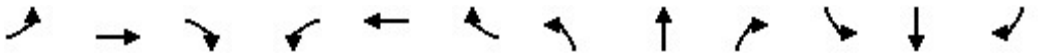
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			136			230			55
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



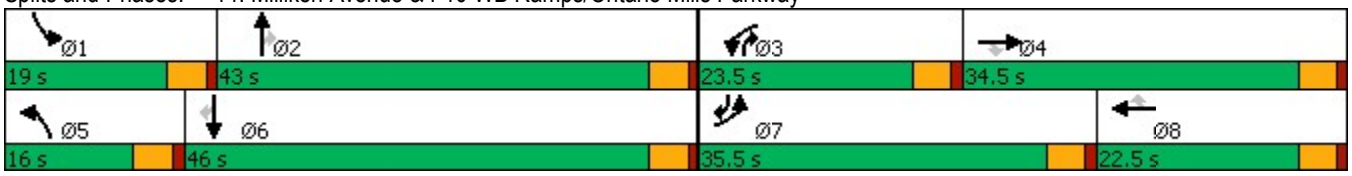
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	669	220	125	266	332	99	202	1313	404	293	1049	767
Future Volume (vph)	669	220	125	266	332	99	202	1313	404	293	1049	767
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	719	237	134	286	357	106	217	1412	434	315	1128	825
Shared Lane Traffic (%)												
Lane Group Flow (vph)	719	237	134	286	357	106	217	1412	434	315	1128	825

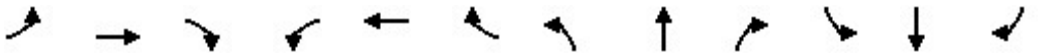
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	669	220	125	266	332	99	202	1313	404	293	1049	767
Future Volume (vph)	669	220	125	266	332	99	202	1313	404	293	1049	767
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	35.5	34.5	34.5	23.5	22.5	22.5	16.0	43.0	23.5	19.0	46.0	35.5
Total Split (%)	29.6%	28.8%	28.8%	19.6%	18.8%	18.8%	13.3%	35.8%	19.6%	15.8%	38.3%	29.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	30.8	30.8	30.8	16.3	16.3	16.3	11.2	36.1	56.9	14.4	39.3	74.7
Actuated g/C Ratio	0.27	0.27	0.27	0.14	0.14	0.14	0.10	0.31	0.49	0.12	0.34	0.65
v/c Ratio	0.93	0.50	0.29	0.70	0.76	0.32	0.78	0.75	0.51	0.88	0.55	0.84
Control Delay	62.4	41.7	14.3	57.6	59.2	6.2	71.1	38.6	10.6	75.9	32.3	24.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	41.7	14.3	57.6	59.2	6.2	71.1	38.6	10.6	75.9	32.3	24.5
LOS	E	D	B	E	E	A	E	D	B	E	C	C
Approach Delay		52.0			51.1			36.1			35.5	
Approach LOS		D			D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 115.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 40.5	Intersection LOS: D
Intersection Capacity Utilization 77.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway

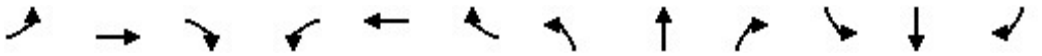




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	719	237	134	286	357	106	217	1412	434	315	1128	825
v/c Ratio	0.93	0.50	0.29	0.70	0.76	0.32	0.78	0.75	0.51	0.88	0.55	0.84
Control Delay	62.4	41.7	14.3	57.6	59.2	6.2	71.1	38.6	10.6	75.9	32.3	24.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	41.7	14.3	57.6	59.2	6.2	71.1	38.6	10.6	75.9	32.3	24.5
Queue Length 50th (ft)	284	158	23	108	140	0	86	279	92	125	202	434
Queue Length 95th (ft)	#408	244	76	155	193	30	#146	324	175	#210	239	671
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	776	470	469	476	522	348	288	2025	885	363	2183	990
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.50	0.29	0.60	0.68	0.30	0.75	0.70	0.49	0.87	0.52	0.83

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	669	220	125	266	332	99	202	1313	404	293	1049	767
Future Volume (veh/h)	669	220	125	266	332	99	202	1313	404	293	1049	767
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	719	237	134	286	357	106	217	1412	434	315	1128	825
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	765	486	412	343	436	194	265	1996	669	361	2196	936
Arrive On Green	0.26	0.27	0.27	0.12	0.13	0.13	0.09	0.33	0.33	0.12	0.36	0.36
Sat Flow, veh/h	2910	1772	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	719	237	134	286	357	106	217	1412	434	315	1128	825
Grp Sat Flow(s),veh/h/ln	1455	1772	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	27.9	12.9	8.2	11.1	11.9	7.6	8.4	23.3	26.0	12.2	16.7	41.5
Cycle Q Clear(g_c), s	27.9	12.9	8.2	11.1	11.9	7.6	8.4	23.3	26.0	12.2	16.7	41.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	765	486	412	343	436	194	265	1996	669	361	2196	936
V/C Ratio(X)	0.94	0.49	0.33	0.83	0.82	0.55	0.82	0.71	0.65	0.87	0.51	0.88
Avail Cap(c_a), veh/h	783	486	412	480	526	235	291	2038	679	366	2196	936
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.6	35.0	33.3	49.7	48.8	47.0	51.4	33.9	24.9	49.6	28.9	18.2
Incr Delay (d2), s/veh	18.9	0.8	0.5	8.6	8.4	2.4	15.4	1.1	2.1	19.9	0.2	9.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.9	5.7	3.0	4.4	5.5	3.0	3.6	8.7	9.5	5.4	6.1	19.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.5	35.8	33.8	58.3	57.2	49.3	66.8	35.0	27.0	69.4	29.1	28.0
LnGrp LOS	E	D	C	E	E	D	E	D	C	E	C	C
Approach Vol, veh/h		1090			749			2063			2268	
Approach Delay, s/veh		51.8			56.5			36.7			34.3	
Approach LOS		D			E			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.8	42.2	18.1	36.1	15.0	46.0	34.8	19.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	38.5	19.0	30.0	11.5	41.5	31.0	18.0
Max Q Clear Time (g_c+I1), s	14.2	28.0	13.1	14.9	10.4	43.5	29.9	13.9
Green Ext Time (p_c), s	0.0	7.6	0.5	1.6	0.1	0.0	0.4	1.0

Intersection Summary	
HCM 6th Ctrl Delay	40.9
HCM 6th LOS	D

Notes

User approved changes to right turn type.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.993	0.850				
Flt Protected	0.955					
Satd. Flow (prot)	3066	1365	0	6071	6071	0
Flt Permitted	0.955					
Satd. Flow (perm)	3066	1365	0	6071	6071	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	11	11				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

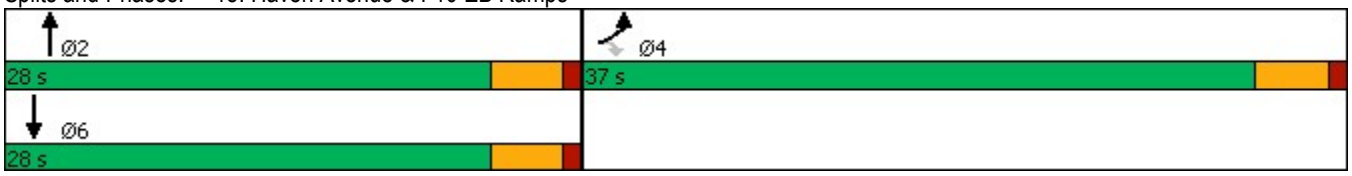
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	998	516	0	1427	1170	0
Future Volume (vph)	998	516	0	1427	1170	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1029	532	0	1471	1206	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	1082	479	0	1471	1206	0

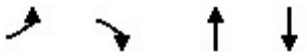
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	998	516	1427	1170
Future Volume (vph)	998	516	1427	1170
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	37.0	37.0	28.0	28.0
Total Split (%)	56.9%	56.9%	43.1%	43.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	26.9	26.9	22.6	22.6
Actuated g/C Ratio	0.46	0.46	0.39	0.39
v/c Ratio	0.77	0.76	0.63	0.52
Control Delay	17.3	21.9	16.8	15.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	17.3	21.9	16.8	15.5
LOS	B	C	B	B
Approach Delay	18.7		16.8	15.5
Approach LOS	B		B	B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 58.6	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 17.1	Intersection LOS: B
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1082	479	1471	1206
v/c Ratio	0.77	0.76	0.63	0.52
Control Delay	17.3	21.9	16.8	15.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	17.3	21.9	16.8	15.5
Queue Length 50th (ft)	156	145	122	95
Queue Length 95th (ft)	223	262	175	138
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	1736	776	2479	2479
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.62	0.62	0.59	0.49

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	998	516	0	1427	1170	0
Future Volume (veh/h)	998	516	0	1427	1170	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1772	0	1772	1772	0
Adj Flow Rate, veh/h	1040	520	0	1471	1206	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	1426	672	0	2310	2310	0
Arrive On Green	0.45	0.45	0.00	0.38	0.38	0.00
Sat Flow, veh/h	3188	1502	0	6592	6592	0
Grp Volume(v), veh/h	1040	520	0	1471	1206	0
Grp Sat Flow(s),veh/h/ln	1594	1502	0	1524	1524	0
Q Serve(g_s), s	13.9	15.2	0.0	10.2	7.9	0.0
Cycle Q Clear(g_c), s	13.9	15.2	0.0	10.2	7.9	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	1426	672	0	2310	2310	0
V/C Ratio(X)	0.73	0.77	0.00	0.64	0.52	0.00
Avail Cap(c_a), veh/h	2000	942	0	2766	2766	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	11.7	12.1	0.0	13.2	12.5	0.0
Incr Delay (d2), s/veh	0.8	2.7	0.0	0.4	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	4.5	0.0	3.0	2.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.6	14.8	0.0	13.5	12.6	0.0
LnGrp LOS	B	B	A	B	B	A
Approach Vol, veh/h	1560			1471	1206	
Approach Delay, s/veh	13.3			13.5	12.6	
Approach LOS	B			B	B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		24.1		27.7		24.1
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		23.5		32.5		23.5
Max Q Clear Time (g_c+I1), s		12.2		17.2		9.9
Green Ext Time (p_c), s		7.4		6.0		7.1

Intersection Summary		
HCM 6th Ctrl Delay	13.2	
HCM 6th LOS	B	

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1600	1800	1600	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2891	1500	2891	6071	6071	1500
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2891	1500	2891	6071	6071	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		13				138
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	853	213	152	1114	816	649
Future Volume (vph)	853	213	152	1114	816	649
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	879	220	157	1148	841	669
Shared Lane Traffic (%)						
Lane Group Flow (vph)	879	220	157	1148	841	669

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	853	213	152	1114	816	649
Future Volume (vph)	853	213	152	1114	816	649
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	39.0	12.0	12.0	36.0	24.0	39.0
Total Split (%)	52.0%	16.0%	16.0%	48.0%	32.0%	52.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	26.6	38.6	7.4	28.0	16.0	47.3
Actuated g/C Ratio	0.42	0.60	0.12	0.44	0.25	0.74
v/c Ratio	0.73	0.24	0.47	0.43	0.55	0.58
Control Delay	19.8	6.5	34.6	13.8	23.1	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.8	6.5	34.6	13.8	23.1	5.0
LOS	B	A	C	B	C	A
Approach Delay	17.1			16.3	15.1	
Approach LOS	B			B	B	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 63.9	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 16.1	Intersection LOS: B
Intersection Capacity Utilization 57.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	879	220	157	1148	841	669
v/c Ratio	0.73	0.24	0.47	0.43	0.55	0.58
Control Delay	19.8	6.5	34.6	13.8	23.1	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.8	6.5	34.6	13.8	23.1	5.0
Queue Length 50th (ft)	143	33	30	87	83	60
Queue Length 95th (ft)	217	68	65	135	127	114
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	1605	920	349	3078	1905	1321
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.24	0.45	0.37	0.44	0.51

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	853	213	152	1114	816	649
Future Volume (veh/h)	853	213	152	1114	816	649
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1772	1575	1772	1772	1772
Adj Flow Rate, veh/h	879	220	157	1148	841	669
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1088	684	237	2889	1930	1037
Arrive On Green	0.37	0.37	0.08	0.47	0.32	0.32
Sat Flow, veh/h	2910	1502	2910	6343	6343	1502
Grp Volume(v), veh/h	879	220	157	1148	841	669
Grp Sat Flow(s),veh/h/ln	1455	1502	1455	1524	1524	1502
Q Serve(g_s), s	16.0	5.5	3.1	7.2	6.5	14.7
Cycle Q Clear(g_c), s	16.0	5.5	3.1	7.2	6.5	14.7
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1088	684	237	2889	1930	1037
V/C Ratio(X)	0.81	0.32	0.66	0.40	0.44	0.65
Avail Cap(c_a), veh/h	1696	997	369	3244	2008	1056
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.6	10.3	26.4	10.1	16.0	5.1
Incr Delay (d2), s/veh	1.7	0.3	3.2	0.1	0.2	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	5.6	1.1	2.1	2.1	9.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.3	10.6	29.6	10.2	16.2	6.4
LnGrp LOS	B	B	C	B	B	A
Approach Vol, veh/h	1099			1305	1510	
Approach Delay, s/veh	16.7			12.5	11.9	
Approach LOS	B			B	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		32.6		26.6	9.3	23.2
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		31.5		34.5	7.5	19.5
Max Q Clear Time (g_c+I1), s		9.2		18.0	5.1	16.7
Green Ext Time (p_c), s		8.8		4.1	0.1	2.0

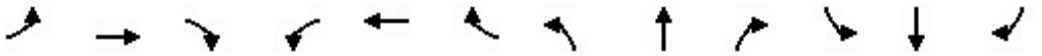
Intersection Summary	
HCM 6th Ctrl Delay	13.5
HCM 6th LOS	B

Appendix D

Intersection LOS Analysis Sheets
Opening Year Without Related Projects Without Project Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.962				0.850			0.850		0.994	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4635	0	2891	3353	1500	2891	4818	1500	2891	6034	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4635	0	2891	3353	1500	2891	4818	1500	2891	6034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		66				149			238		9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



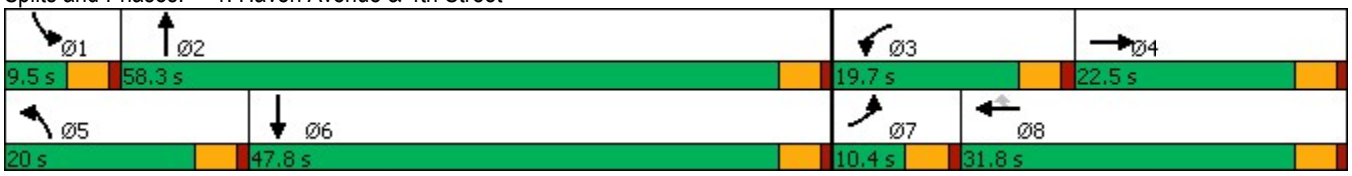
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	93	300	102	244	522	132	209	1539	483	88	1234	55
Future Volume (vph)	93	300	102	244	522	132	209	1539	483	88	1234	55
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	102	330	112	268	574	145	230	1691	531	97	1356	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	102	442	0	268	574	145	230	1691	531	97	1416	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	93	300	244	522	132	209	1539	483	88	1234
Future Volume (vph)	93	300	244	522	132	209	1539	483	88	1234
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	10.4	22.5	19.7	31.8	31.8	20.0	58.3		9.5	47.8
Total Split (%)	9.5%	20.5%	17.9%	28.9%	28.9%	18.2%	53.0%		8.6%	43.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	5.9	15.6	13.8	23.5	23.5	13.2	53.9	106.3	5.0	45.7
Actuated g/C Ratio	0.06	0.15	0.13	0.22	0.22	0.12	0.51	1.00	0.05	0.43
v/c Ratio	0.64	0.60	0.72	0.78	0.32	0.64	0.69	0.35	0.71	0.54
Control Delay	68.5	39.6	56.1	46.7	7.2	53.3	22.3	0.7	79.1	24.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.5	39.6	56.1	46.7	7.2	53.3	22.3	0.7	79.1	24.2
LOS	E	D	E	D	A	D	C	A	E	C
Approach Delay		45.0		43.5			20.5			27.7
Approach LOS		D		D			C			C

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 106.3	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 29.0	Intersection LOS: C
Intersection Capacity Utilization 70.0%	ICU Level of Service C
Analysis Period (min) 15	

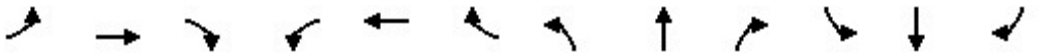
Splits and Phases: 1: Haven Avenue & 4th Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	102	442	268	574	145	230	1691	531	97	1416
v/c Ratio	0.64	0.60	0.72	0.78	0.32	0.64	0.69	0.35	0.71	0.54
Control Delay	68.5	39.6	56.1	46.7	7.2	53.3	22.3	0.7	79.1	24.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.5	39.6	56.1	46.7	7.2	53.3	22.3	0.7	79.1	24.2
Queue Length 50th (ft)	36	89	91	194	0	78	317	0	34	210
Queue Length 95th (ft)	#75	126	139	256	47	120	390	0	#79	263
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	160	840	414	862	496	422	2441	1500	136	2601
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.53	0.65	0.67	0.29	0.55	0.69	0.35	0.71	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



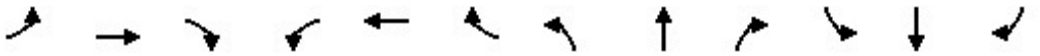
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	300	102	244	522	132	209	1539	483	88	1234	55
Future Volume (veh/h)	93	300	102	244	522	132	209	1539	483	88	1234	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	102	330	112	268	574	145	230	1691	0	97	1356	60
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	148	534	172	327	704	314	291	2508		140	2814	124
Arrive On Green	0.05	0.15	0.15	0.11	0.21	0.21	0.10	0.52	0.00	0.05	0.47	0.47
Sat Flow, veh/h	2910	3621	1166	2910	3367	1502	2910	4837	1502	2910	6029	266
Grp Volume(v), veh/h	102	292	150	268	574	145	230	1691	0	97	1028	388
Grp Sat Flow(s),veh/h/ln	1455	1612	1562	1455	1683	1502	1455	1612	1502	1455	1524	1724
Q Serve(g_s), s	3.6	8.8	9.4	9.3	16.9	8.8	8.0	26.9	0.0	3.4	16.0	16.1
Cycle Q Clear(g_c), s	3.6	8.8	9.4	9.3	16.9	8.8	8.0	26.9	0.0	3.4	16.0	16.1
Prop In Lane	1.00		0.75	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	148	476	230	327	704	314	291	2508		140	2134	805
V/C Ratio(X)	0.69	0.61	0.65	0.82	0.82	0.46	0.79	0.67		0.69	0.48	0.48
Avail Cap(c_a), veh/h	165	559	271	426	886	395	435	2508		140	2134	805
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.4	41.5	41.7	45.0	39.1	35.9	45.7	18.5	0.0	48.6	19.0	19.0
Incr Delay (d2), s/veh	9.9	1.5	4.3	9.3	4.8	1.1	5.8	1.5	0.0	13.6	0.8	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	3.6	3.9	3.8	7.4	3.3	3.1	9.9	0.0	1.5	5.7	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.4	43.0	46.0	54.3	43.9	37.0	51.5	20.0	0.0	62.2	19.8	21.1
LnGrp LOS	E	D	D	D	D	D	D	B		E	B	C
Approach Vol, veh/h		544			987			1921	A		1513	
Approach Delay, s/veh		46.7			45.7			23.7			22.9	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	58.3	16.2	19.8	14.9	52.9	9.8	26.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	53.8	15.2	18.0	15.5	43.3	5.9	27.3
Max Q Clear Time (g_c+I1), s	5.4	28.9	11.3	11.4	10.0	18.1	5.6	18.9
Green Ext Time (p_c), s	0.0	14.6	0.3	1.5	0.4	11.3	0.0	2.8

Intersection Summary	
HCM 6th Ctrl Delay	30.4
HCM 6th LOS	C

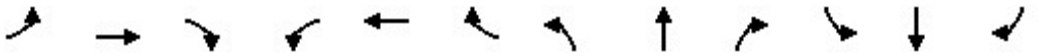
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.994				0.850			0.850		0.850	
Flt Protected	0.950			0.950			0.950					
Satd. Flow (prot)	1583	6034	0	1583	4818	1500	1583	1765	1500	1667	2850	0
Flt Permitted	0.950			0.950			0.950					
Satd. Flow (perm)	1583	6034	0	1583	4818	1500	1583	1765	1500	1667	2850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11				164			164		434	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	38	495	21	1	683	56	3	1	1	0	0	3
Future Volume (vph)	38	495	21	1	683	56	3	1	1	0	0	3
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	42	550	23	1	759	62	3	1	1	0	0	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	573	0	1	759	62	3	1	1	0	3	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBT	Ø1
Lane Configurations										
Traffic Volume (vph)	38	495	1	683	56	3	1	1	0	
Future Volume (vph)	38	495	1	683	56	3	1	1	0	
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	NA	
Protected Phases	7	4	3	8		5	2		6	1
Permitted Phases					8			2		
Detector Phase	7	4	3	8	8	5	2	2	6	
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	22.5	9.5
Total Split (s)	9.5	22.5	9.5	22.5	22.5	11.3	23.0	23.0	26.7	15.0
Total Split (%)	13.6%	32.1%	13.6%	32.1%	32.1%	16.1%	32.9%	32.9%	38.1%	21%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	Min	Min	None
Act Effct Green (s)	5.5	13.3	5.5	13.3	13.3	6.1	7.3	7.3	6.0	
Actuated g/C Ratio	0.17	0.42	0.17	0.42	0.42	0.19	0.23	0.23	0.19	
v/c Ratio	0.15	0.22	0.00	0.37	0.09	0.01	0.00	0.00	0.00	
Control Delay	17.4	6.9	17.0	7.9	0.2	16.3	12.0	0.0	0.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	17.4	6.9	17.0	7.9	0.2	16.3	12.0	0.0	0.0	
LOS	B	A	B	A	A	B	B	A	A	
Approach Delay		7.7		7.3			12.2			
Approach LOS		A		A			B			

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 31.6	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.37	
Intersection Signal Delay: 7.5	Intersection LOS: A
Intersection Capacity Utilization 33.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street

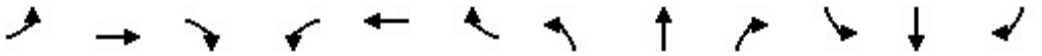
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	42	573	1	759	62	3	1	1	3
v/c Ratio	0.15	0.22	0.00	0.37	0.09	0.01	0.00	0.00	0.00
Control Delay	17.4	6.9	17.0	7.9	0.2	16.3	12.0	0.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.4	6.9	17.0	7.9	0.2	16.3	12.0	0.0	0.0
Queue Length 50th (ft)	5	10	0	19	0	0	0	0	0
Queue Length 95th (ft)	36	52	4	93	0	7	3	0	0
Internal Link Dist (ft)		2546		362			269		358
Turn Bay Length (ft)	130		130		145	165		165	
Base Capacity (vph)	273	3754	273	2994	994	371	1127	1017	2286
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.15	0.00	0.25	0.06	0.01	0.00	0.00	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	495	21	1	683	56	3	1	1	0	0	3
Future Volume (veh/h)	38	495	21	1	683	56	3	1	1	0	0	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	42	550	23	1	759	62	3	1	1	0	0	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	76	2111	87	4	1464	455	7	480	406	4	236	211
Arrive On Green	0.05	0.35	0.35	0.00	0.30	0.30	0.00	0.27	0.27	0.00	0.00	0.14
Sat Flow, veh/h	1594	6048	250	1594	4837	1502	1594	1772	1502	1594	1683	1502
Grp Volume(v), veh/h	42	414	159	1	759	62	3	1	1	0	0	3
Grp Sat Flow(s),veh/h/ln	1594	1524	1727	1594	1612	1502	1594	1772	1502	1594	1683	1502
Q Serve(g_s), s	0.9	2.3	2.3	0.0	4.6	1.1	0.1	0.0	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.9	2.3	2.3	0.0	4.6	1.1	0.1	0.0	0.0	0.0	0.0	0.1
Prop In Lane	1.00		0.15	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	76	1596	603	4	1464	455	7	480	406	4	236	211
V/C Ratio(X)	0.55	0.26	0.26	0.22	0.52	0.14	0.46	0.00	0.00	0.00	0.00	0.01
Avail Cap(c_a), veh/h	224	2309	872	224	2443	758	304	920	780	470	1049	935
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	16.6	8.3	8.3	17.8	10.3	9.0	17.7	9.5	9.5	0.0	0.0	13.2
Incr Delay (d2), s/veh	6.1	0.1	0.2	23.5	0.3	0.1	42.8	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.5	0.7	0.0	1.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.7	8.4	8.5	41.2	10.6	9.2	60.5	9.5	9.5	0.0	0.0	13.2
LnGrp LOS	C	A	A	D	B	A	E	A	A	A	A	B
Approach Vol, veh/h		615			822			5			3	
Approach Delay, s/veh		9.4			10.5			40.1			13.2	
Approach LOS		A			B			D			B	

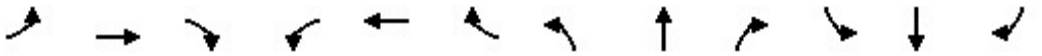
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	0.0	14.1	4.5	16.9	4.6	9.5	6.2	15.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	18.5	5.0	18.0	6.8	22.2	5.0	18.0
Max Q Clear Time (g_c+I1), s	0.0	2.0	2.0	4.3	2.1	2.1	2.9	6.6
Green Ext Time (p_c), s	0.0	0.0	0.0	3.1	0.0	0.0	0.0	4.2

Intersection Summary	
HCM 6th Ctrl Delay	10.1
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.996				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.956	
Satd. Flow (prot)	2891	6065	0	1583	4798	0	1583	1765	1500	0	1687	1500
Flt Permitted	0.950			0.950			0.731				0.740	
Satd. Flow (perm)	2891	6065	0	1583	4798	0	1218	1765	1500	0	1306	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			8				109			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



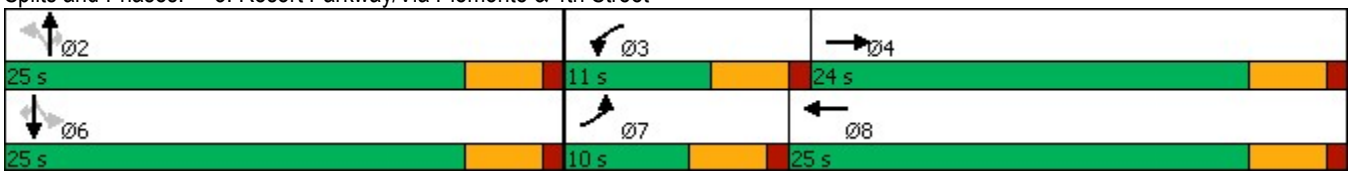
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	15	491	4	16	702	20	8	3	11	34	3	17
Future Volume (vph)	15	491	4	16	702	20	8	3	11	34	3	17
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	16	528	4	17	755	22	9	3	12	37	3	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	532	0	17	777	0	9	3	12	0	40	18

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	15	491	16	702	8	3	11	34	3	17
Future Volume (vph)	15	491	16	702	8	3	11	34	3	17
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8		2			6	
Permitted Phases					2		2	6		6
Detector Phase	7	4	3	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	10.0	24.0	11.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (%)	16.7%	40.0%	18.3%	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	5.8	12.3	6.2	12.4	6.8	6.8	6.8		6.8	6.8
Actuated g/C Ratio	0.19	0.41	0.21	0.41	0.23	0.23	0.23		0.23	0.23
v/c Ratio	0.03	0.21	0.05	0.39	0.03	0.01	0.03		0.14	0.04
Control Delay	14.3	6.5	14.0	7.2	12.9	12.7	0.1		13.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	14.3	6.5	14.0	7.2	12.9	12.7	0.1		13.5	0.2
LOS	B	A	B	A	B	B	A		B	A
Approach Delay		6.8		7.4		6.5			9.3	
Approach LOS		A		A		A			A	

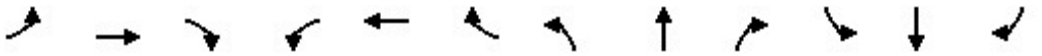
Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 30	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.39	
Intersection Signal Delay: 7.2	Intersection LOS: A
Intersection Capacity Utilization 34.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	16	532	17	777	9	3	12	40	18
v/c Ratio	0.03	0.21	0.05	0.39	0.03	0.01	0.03	0.14	0.04
Control Delay	14.3	6.5	14.0	7.2	12.9	12.7	0.1	13.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	6.5	14.0	7.2	12.9	12.7	0.1	13.5	0.2
Queue Length 50th (ft)	1	10	2	21	1	0	0	4	0
Queue Length 95th (ft)	8	40	17	74	11	6	0	29	0
Internal Link Dist (ft)		362		428		302		378	
Turn Bay Length (ft)	220		125		115		115		110
Base Capacity (vph)	563	4190	364	3487	884	1282	1119	948	1119
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.13	0.05	0.22	0.01	0.00	0.01	0.04	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	491	4	16	702	20	8	3	11	34	3	17
Future Volume (veh/h)	15	491	4	16	702	20	8	3	11	34	3	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	16	528	4	17	755	22	9	3	12	37	3	18
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	61	2156	16	35	1662	48	443	304	258	456	28	258
Arrive On Green	0.02	0.34	0.34	0.02	0.34	0.34	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	2910	6287	48	1594	4831	140	1314	1772	1502	1272	161	1502
Grp Volume(v), veh/h	16	384	148	17	503	274	9	3	12	40	0	18
Grp Sat Flow(s),veh/h/ln	1455	1524	1763	1594	1612	1747	1314	1772	1502	1432	0	1502
Q Serve(g_s), s	0.2	1.8	1.8	0.3	3.5	3.5	0.2	0.0	0.2	0.5	0.0	0.3
Cycle Q Clear(g_c), s	0.2	1.8	1.8	0.3	3.5	3.5	0.8	0.0	0.2	0.7	0.0	0.3
Prop In Lane	1.00		0.03	1.00		0.08	1.00		1.00	0.92		1.00
Lane Grp Cap(c), veh/h	61	1567	605	35	1110	601	443	304	258	484	0	258
V/C Ratio(X)	0.26	0.24	0.25	0.48	0.45	0.46	0.02	0.01	0.05	0.08	0.00	0.07
Avail Cap(c_a), veh/h	549	3060	1180	356	2269	1229	1142	1247	1057	1240	0	1057
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.0	6.9	6.9	14.1	7.4	7.4	10.6	10.0	10.1	10.3	0.0	10.1
Incr Delay (d2), s/veh	2.3	0.1	0.2	9.9	0.3	0.5	0.0	0.0	0.1	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.4	0.4	0.2	0.8	0.9	0.0	0.0	0.1	0.2	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.3	6.9	7.1	24.0	7.7	8.0	10.6	10.0	10.1	10.3	0.0	10.2
LnGrp LOS	B	A	A	C	A	A	B	B	B	B	A	B
Approach Vol, veh/h		548			794			24			58	
Approach Delay, s/veh		7.3			8.2			10.3			10.3	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	5.1	14.5		9.5	5.1	14.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		20.5	6.5	19.5		20.5	5.5	20.5				
Max Q Clear Time (g_c+I1), s		2.8	2.3	3.8		2.7	2.2	5.5				
Green Ext Time (p_c), s		0.0	0.0	3.1		0.2	0.0	4.5				

Intersection Summary												
HCM 6th Ctrl Delay			7.9									
HCM 6th LOS			A									

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.994					0.865
Flt Protected						
Satd. Flow (prot)	4789	0	0	4818	0	1526
Flt Permitted						
Satd. Flow (perm)	4789	0	0	4818	0	1526
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	529	21	0	695	0	3
Future Volume (vph)	529	21	0	695	0	3
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	575	23	0	755	0	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	598	0	0	755	0	3

Intersection Summary

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	529	21	0	695	0	3
Future Vol, veh/h	529	21	0	695	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	575	23	0	755	0	3

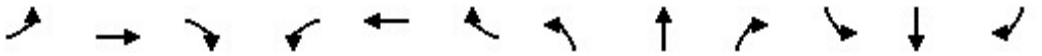
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	299
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	595
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	595
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	595	-	-	-
HCM Lane V/C Ratio	0.005	-	-	-
HCM Control Delay (s)	11.1	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5973	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5973	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			182			287			73		29	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



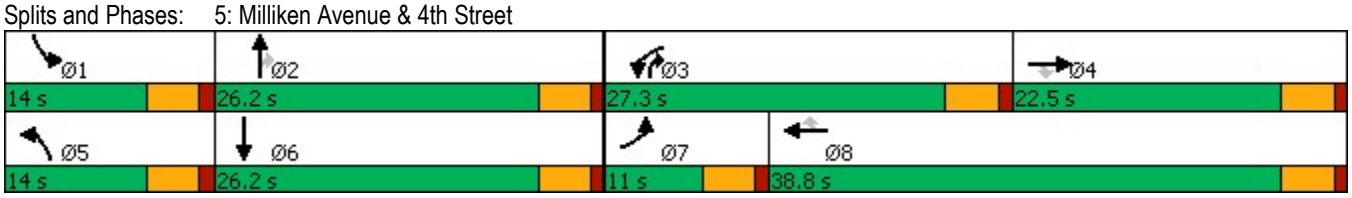
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	147	380	102	461	1178	392	199	933	146	198	817	95
Future Volume (vph)	147	380	102	461	1178	392	199	933	146	198	817	95
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	158	409	110	496	1267	422	214	1003	157	213	878	102
Shared Lane Traffic (%)												
Lane Group Flow (vph)	158	409	110	496	1267	422	214	1003	157	213	980	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	147	380	102	461	1178	392	199	933	146	198	817
Future Volume (vph)	147	380	102	461	1178	392	199	933	146	198	817
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	11.0	22.5	22.5	27.3	38.8	38.8	14.0	26.2	27.3	14.0	26.2
Total Split (%)	12.2%	25.0%	25.0%	30.3%	43.1%	43.1%	15.6%	29.1%	30.3%	15.6%	29.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	6.5	19.6	19.6	19.4	32.5	32.5	9.2	20.5	44.5	9.2	20.5
Actuated g/C Ratio	0.07	0.23	0.23	0.22	0.37	0.37	0.11	0.24	0.51	0.11	0.24
v/c Ratio	0.73	0.38	0.23	0.77	0.70	0.57	0.70	0.70	0.20	0.69	0.68
Control Delay	61.3	30.7	1.8	40.4	25.7	10.3	51.6	33.6	6.6	51.4	32.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.3	30.7	1.8	40.4	25.7	10.3	51.6	33.6	6.6	51.4	32.3
LOS	E	C	A	D	C	B	D	C	A	D	C
Approach Delay		33.1			26.1			33.3			35.7
Approach LOS		C			C			C			D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 86.9	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 30.9	Intersection LOS: C
Intersection Capacity Utilization 65.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Milliken Avenue & 4th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	158	409	110	496	1267	422	214	1003	157	213	980
v/c Ratio	0.73	0.38	0.23	0.77	0.70	0.57	0.70	0.70	0.20	0.69	0.68
Control Delay	61.3	30.7	1.8	40.4	25.7	10.3	51.6	33.6	6.6	51.4	32.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.3	30.7	1.8	40.4	25.7	10.3	51.6	33.6	6.6	51.4	32.3
Queue Length 50th (ft)	46	72	0	136	217	51	61	151	23	61	142
Queue Length 95th (ft)	#95	105	7	185	268	140	#108	188	51	#108	179
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	217	1087	479	762	1911	768	317	1523	860	317	1521
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.38	0.23	0.65	0.66	0.55	0.68	0.66	0.18	0.67	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

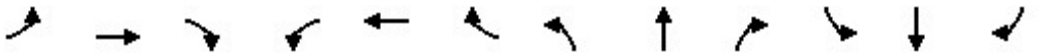
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	147	380	102	461	1178	392	199	933	146	198	817	95
Future Volume (veh/h)	147	380	102	461	1178	392	199	933	146	198	817	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	158	409	110	496	1267	422	214	1003	157	213	878	102
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	221	1183	367	592	1801	559	283	1401	651	282	1282	147
Arrive On Green	0.08	0.24	0.24	0.20	0.37	0.37	0.10	0.23	0.23	0.10	0.23	0.23
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	2910	6095	1502	2910	5588	641
Grp Volume(v), veh/h	158	409	110	496	1267	422	214	1003	157	213	716	264
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1455	1524	1502	1455	1524	1657
Q Serve(g_s), s	4.2	5.6	4.8	13.1	17.8	19.6	5.7	12.1	5.3	5.7	11.5	11.7
Cycle Q Clear(g_c), s	4.2	5.6	4.8	13.1	17.8	19.6	5.7	12.1	5.3	5.7	11.5	11.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.39
Lane Grp Cap(c), veh/h	221	1183	367	592	1801	559	283	1401	651	282	1049	380
V/C Ratio(X)	0.72	0.35	0.30	0.84	0.70	0.75	0.76	0.72	0.24	0.75	0.68	0.69
Avail Cap(c_a), veh/h	236	1183	367	829	2074	644	346	1654	713	346	1240	449
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.1	24.9	24.6	30.6	21.4	21.9	35.2	28.4	14.3	35.2	28.2	28.2
Incr Delay (d2), s/veh	9.2	0.2	0.5	5.4	0.9	4.4	7.4	1.2	0.2	7.3	1.2	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	2.1	1.7	4.9	6.5	7.2	2.3	4.4	1.7	2.3	4.2	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.3	25.1	25.1	36.0	22.3	26.3	42.6	29.6	14.5	42.5	29.4	31.9
LnGrp LOS	D	C	C	D	C	C	D	C	B	D	C	C
Approach Vol, veh/h		677			2185			1374			1193	
Approach Delay, s/veh		29.8			26.2			29.9			32.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.3	22.9	20.8	24.1	12.3	22.9	10.6	34.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	21.7	22.8	18.0	9.5	21.7	6.5	34.3
Max Q Clear Time (g_c+I1), s	7.7	14.1	15.1	7.6	7.7	13.7	6.2	21.6
Green Ext Time (p_c), s	0.1	4.2	1.2	2.3	0.1	3.9	0.0	8.2

Intersection Summary	
HCM 6th Ctrl Delay	28.9
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.901	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2894	1365
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2894	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136			136			136		215	215
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



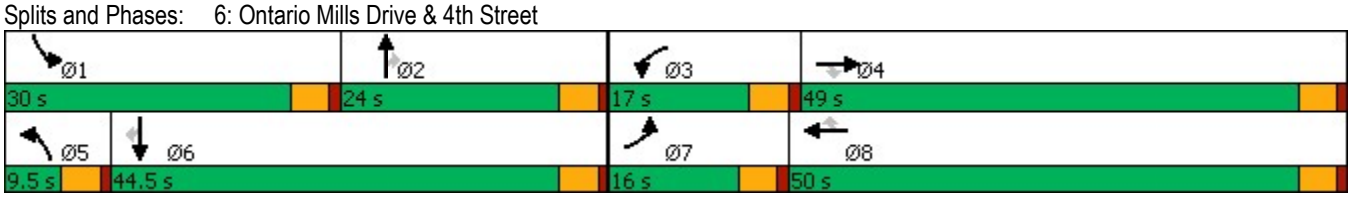
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	286	333	59	110	1293	131	72	71	78	147	223	866
Future Volume (vph)	286	333	59	110	1293	131	72	71	78	147	223	866
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	329	383	68	126	1486	151	83	82	90	169	256	995
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	329	383	68	126	1486	151	83	82	90	169	754	497

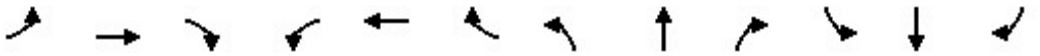
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	286	333	59	110	1293	131	72	71	78	147	223	866
Future Volume (vph)	286	333	59	110	1293	131	72	71	78	147	223	866
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	16.0	49.0	49.0	17.0	50.0	50.0	9.5	24.0	24.0	30.0	44.5	44.5
Total Split (%)	13.3%	40.8%	40.8%	14.2%	41.7%	41.7%	7.9%	20.0%	20.0%	25.0%	37.1%	37.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	11.7	44.5	44.5	10.1	42.9	42.9	5.1	21.9	21.9	17.3	34.2	34.2
Actuated g/C Ratio	0.10	0.40	0.40	0.09	0.38	0.38	0.05	0.20	0.20	0.15	0.31	0.31
v/c Ratio	1.10	0.20	0.10	0.48	0.81	0.23	1.17	0.13	0.22	0.69	0.85dr	0.88
Control Delay	127.9	23.7	0.3	57.0	35.5	6.3	209.8	40.1	3.3	60.8	28.9	38.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	127.9	23.7	0.3	57.0	35.5	6.3	209.8	40.1	3.3	60.8	28.9	38.7
LOS	F	C	A	E	D	A	F	D	A	E	C	D
Approach Delay		65.6			34.6			82.4			36.2	
Approach LOS		E			C			F			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 112.1	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 43.7	Intersection LOS: D
Intersection Capacity Utilization 79.8%	ICU Level of Service D
Analysis Period (min) 15	
dr Defacto Right Lane. Recode with 1 though lane as a right lane.	

Splits and Phases: 6: Ontario Mills Drive & 4th Street





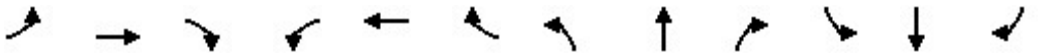
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	329	383	68	126	1486	151	83	82	90	169	754	497
v/c Ratio	1.10	0.20	0.10	0.48	0.81	0.23	1.17	0.13	0.22	0.69	0.85dr	0.88
Control Delay	127.9	23.7	0.3	57.0	35.5	6.3	209.8	40.1	3.3	60.8	28.9	38.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	127.9	23.7	0.3	57.0	35.5	6.3	209.8	40.1	3.3	60.8	28.9	38.7
Queue Length 50th (ft)	~158	71	0	48	374	7	~81	26	0	126	199	235
Queue Length 95th (ft)	#240	95	0	76	415	47	#179	51	11	183	257	#395
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	300	1986	698	327	1982	697	71	683	414	365	1184	630
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.10	0.19	0.10	0.39	0.75	0.22	1.17	0.12	0.22	0.46	0.64	0.79

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



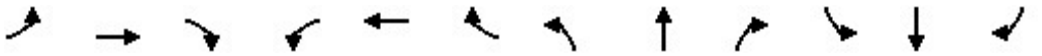
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	286	333	59	110	1293	131	72	71	78	147	223	866
Future Volume (veh/h)	286	333	59	110	1293	131	72	71	78	147	223	866
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	329	383	68	126	1486	151	83	82	90	169	256	995
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	286	1939	602	174	1753	544	68	881	393	197	607	1028
Arrive On Green	0.10	0.40	0.40	0.06	0.36	0.36	0.04	0.26	0.26	0.12	0.34	0.34
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	1594	3367	1502	1594	1772	3003
Grp Volume(v), veh/h	329	383	68	126	1486	151	83	82	90	169	256	995
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1594	1683	1502	1594	1772	1502
Q Serve(g_s), s	11.5	6.0	3.3	5.0	33.0	8.3	5.0	2.2	5.5	12.1	13.0	38.1
Cycle Q Clear(g_c), s	11.5	6.0	3.3	5.0	33.0	8.3	5.0	2.2	5.5	12.1	13.0	38.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	286	1939	602	174	1753	544	68	881	393	197	607	1028
V/C Ratio(X)	1.15	0.20	0.11	0.72	0.85	0.28	1.22	0.09	0.23	0.86	0.42	0.97
Avail Cap(c_a), veh/h	286	1939	602	311	1884	585	68	881	393	348	607	1028
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.7	22.8	22.0	54.0	34.3	26.4	55.9	32.6	33.9	50.2	29.5	37.8
Incr Delay (d2), s/veh	99.5	0.0	0.1	5.5	3.6	0.3	178.6	0.0	0.3	10.4	0.5	20.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	2.3	1.2	2.0	13.3	3.0	5.4	0.9	2.0	5.4	5.6	16.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	152.2	22.8	22.0	59.5	37.9	26.7	234.5	32.7	34.2	60.6	30.0	58.4
LnGrp LOS	F	C	C	E	D	C	F	C	C	E	C	E
Approach Vol, veh/h		780			1763			255			1420	
Approach Delay, s/veh		77.3			38.5			98.9			53.5	
Approach LOS		E			D			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.9	35.1	11.5	51.3	9.5	44.5	16.0	46.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	25.5	19.5	12.5	44.5	5.0	40.0	11.5	45.5
Max Q Clear Time (g_c+I1), s	14.1	7.5	7.0	8.0	7.0	40.1	13.5	35.0
Green Ext Time (p_c), s	0.3	0.5	0.2	3.1	0.0	0.0	0.0	7.3

Intersection Summary	
HCM 6th Ctrl Delay	54.4
HCM 6th LOS	D

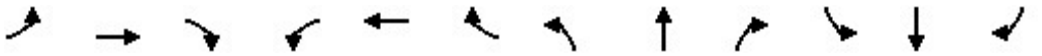
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.983			0.892				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.966	
Satd. Flow (prot)	2891	4818	1500	1583	4736	0	1583	2991	0	1504	1619	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.966	
Satd. Flow (perm)	2891	4818	1500	1583	4736	0	1583	2991	0	1504	1619	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127		24			60				503
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



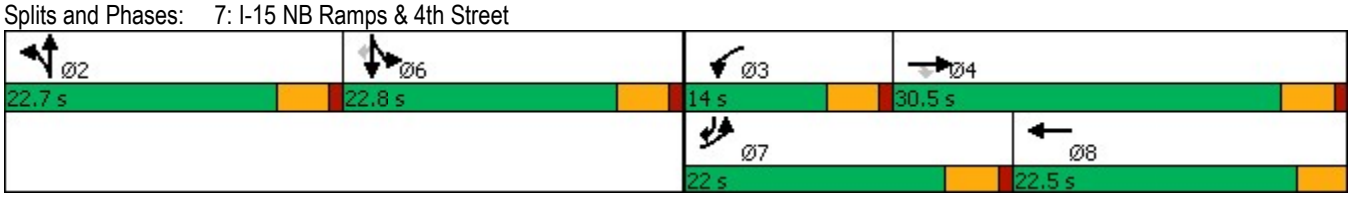
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	182	327	77	45	468	62	110	22	57	370	66	961
Future Volume (vph)	182	327	77	45	468	62	110	22	57	370	66	961
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	192	344	81	47	493	65	116	23	60	389	69	1012
Shared Lane Traffic (%)										42%		
Lane Group Flow (vph)	192	344	81	47	558	0	116	83	0	226	232	1012

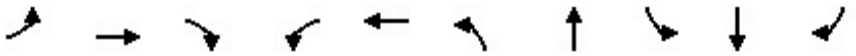
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	182	327	77	45	468	110	22	370	66	961
Future Volume (vph)	182	327	77	45	468	110	22	370	66	961
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	22.0	30.5	30.5	14.0	22.5	22.7	22.7	22.8	22.8	22.0
Total Split (%)	24.4%	33.9%	33.9%	15.6%	25.0%	25.2%	25.2%	25.3%	25.3%	24.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	12.4	23.4	23.4	7.6	14.4	10.8	10.8	15.2	15.2	32.3
Actuated g/C Ratio	0.18	0.33	0.33	0.11	0.20	0.15	0.15	0.22	0.22	0.46
v/c Ratio	0.38	0.21	0.14	0.28	0.57	0.48	0.16	0.70	0.66	0.68
Control Delay	30.0	20.2	2.1	37.6	27.8	37.0	13.4	40.8	38.1	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	20.2	2.1	37.6	27.8	37.0	13.4	40.8	38.1	10.2
LOS	C	C	A	D	C	D	B	D	D	B
Approach Delay		20.9			28.5		27.2		19.3	
Approach LOS		C			C		C		B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 70.4	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 22.1	Intersection LOS: C
Intersection Capacity Utilization 64.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street





Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	192	344	81	47	558	116	83	226	232	1012
v/c Ratio	0.38	0.21	0.14	0.28	0.57	0.48	0.16	0.70	0.66	0.68
Control Delay	30.0	20.2	2.1	37.6	27.8	37.0	13.4	40.8	38.1	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	20.2	2.1	37.6	27.8	37.0	13.4	40.8	38.1	10.2
Queue Length 50th (ft)	38	44	0	19	77	47	4	93	95	83
Queue Length 95th (ft)	78	76	12	58	132	108	25	#233	#228	194
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	747	1859	656	222	1346	425	847	406	437	1658
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.19	0.12	0.21	0.41	0.27	0.10	0.56	0.53	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	182	327	77	45	468	62	110	22	57	370	66	961
Future Volume (veh/h)	182	327	77	45	468	62	110	22	57	370	66	961
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	192	344	81	47	493	65	116	23	60	438	0	1012
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	292	1155	358	72	796	103	179	189	169	970	0	1215
Arrive On Green	0.10	0.24	0.24	0.05	0.18	0.18	0.11	0.11	0.11	0.30	0.00	0.30
Sat Flow, veh/h	2910	4837	1502	1594	4334	562	1594	1683	1502	3188	0	3003
Grp Volume(v), veh/h	192	344	81	47	365	193	116	23	60	438	0	1012
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1594	1612	1671	1594	1683	1502	1594	0	1502
Q Serve(g_s), s	3.8	3.5	2.6	1.7	6.3	6.4	4.2	0.7	2.2	6.7	0.0	18.2
Cycle Q Clear(g_c), s	3.8	3.5	2.6	1.7	6.3	6.4	4.2	0.7	2.2	6.7	0.0	18.2
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	292	1155	358	72	592	307	179	189	169	970	0	1215
V/C Ratio(X)	0.66	0.30	0.23	0.65	0.62	0.63	0.65	0.12	0.36	0.45	0.00	0.83
Avail Cap(c_a), veh/h	847	2091	649	252	1019	528	482	509	454	970	0	1215
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.1	18.8	18.4	28.2	22.6	22.7	25.5	24.0	24.7	16.9	0.0	16.1
Incr Delay (d2), s/veh	2.5	0.1	0.3	9.5	1.0	2.1	3.9	0.3	1.3	0.3	0.0	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	1.2	0.9	0.8	2.3	2.5	1.7	0.3	0.8	2.3	0.0	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.6	18.9	18.7	37.8	23.6	24.8	29.4	24.3	25.9	17.2	0.0	21.2
LnGrp LOS	C	B	B	D	C	C	C	C	C	B	A	C
Approach Vol, veh/h		617			605			199			1450	
Approach Delay, s/veh		21.9			25.1			27.8			20.0	
Approach LOS		C			C			C			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		11.3	7.2	18.9		22.8	10.5	15.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		18.2	9.5	26.0		18.3	17.5	* 19				
Max Q Clear Time (g_c+I1), s		6.2	3.7	5.5		20.2	5.8	8.4				
Green Ext Time (p_c), s		0.6	0.0	2.5		0.0	0.5	2.6				

Intersection Summary	
HCM 6th Ctrl Delay	22.0
HCM 6th LOS	C

Notes

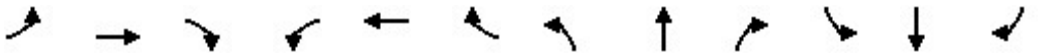
User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

User approved changes to right turn type.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.904				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3031	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3031	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		90				182			182			182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



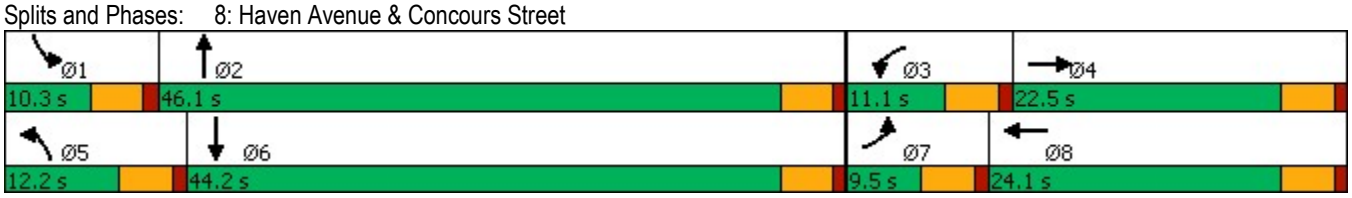
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	21	45	81	163	59	18	71	1807	136	97	1375	44
Future Volume (vph)	21	45	81	163	59	18	71	1807	136	97	1375	44
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	23	50	90	181	66	20	79	2008	151	108	1528	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	140	0	181	66	20	79	2008	151	108	1528	49

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	21	45	163	59	18	71	1807	136	97	1375	44
Future Volume (vph)	21	45	163	59	18	71	1807	136	97	1375	44
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	11.1	24.1		12.2	46.1		10.3	44.2	
Total Split (%)	10.6%	25.0%	12.3%	26.8%		13.6%	51.2%		11.4%	49.1%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.1	7.0	6.7	14.7	75.3	7.0	40.1	75.3	5.9	38.9	75.3
Actuated g/C Ratio	0.07	0.09	0.09	0.20	1.00	0.09	0.53	1.00	0.08	0.52	1.00
v/c Ratio	0.12	0.39	0.52	0.10	0.01	0.29	0.62	0.10	0.48	0.49	0.03
Control Delay	37.1	17.9	40.3	29.7	0.0	36.8	13.8	0.1	43.2	13.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.1	17.9	40.3	29.7	0.0	36.8	13.8	0.1	43.2	13.0	0.0
LOS	D	B	D	C	A	D	B	A	D	B	A
Approach Delay		20.6		34.7			13.7			14.6	
Approach LOS		C		C			B			B	

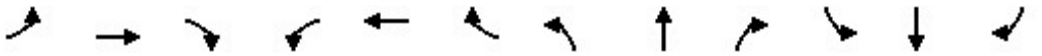
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 75.3	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 15.6	Intersection LOS: B
Intersection Capacity Utilization 55.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	23	140	181	66	20	79	2008	151	108	1528	49
v/c Ratio	0.12	0.39	0.52	0.10	0.01	0.29	0.62	0.10	0.48	0.49	0.03
Control Delay	37.1	17.9	40.3	29.7	0.0	36.8	13.8	0.1	43.2	13.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.1	17.9	40.3	29.7	0.0	36.8	13.8	0.1	43.2	13.0	0.0
Queue Length 50th (ft)	5	12	30	13	0	19	188	0	26	135	0
Queue Length 95th (ft)	17	38	53	34	0	40	243	0	53	178	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	194	803	350	885	1500	299	3403	1500	226	3266	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.17	0.52	0.07	0.01	0.26	0.59	0.10	0.48	0.47	0.03

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	45	81	163	59	18	71	1807	136	97	1375	44
Future Volume (veh/h)	21	45	81	163	59	18	71	1807	136	97	1375	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	23	50	90	181	66	0	79	2008	0	108	1528	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	75	157	140	287	471		165	3106		184	3148	
Arrive On Green	0.03	0.09	0.09	0.07	0.14	0.00	0.06	0.51	0.00	0.06	0.52	0.00
Sat Flow, veh/h	2910	1683	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	23	50	90	181	66	0	79	2008	0	108	1528	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	0.5	1.9	4.0	3.1	1.2	0.0	1.8	16.6	0.0	2.5	11.1	0.0
Cycle Q Clear(g_c), s	0.5	1.9	4.0	3.1	1.2	0.0	1.8	16.6	0.0	2.5	11.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	75	157	140	287	471		165	3106		184	3148	
V/C Ratio(X)	0.31	0.32	0.64	0.63	0.14		0.48	0.65		0.59	0.49	
Avail Cap(c_a), veh/h	211	440	392	380	958		325	3681		245	3513	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.9	29.2	30.1	31.1	26.0	0.0	31.5	12.4	0.0	31.4	10.7	0.0
Incr Delay (d2), s/veh	2.3	1.2	4.8	2.3	0.1	0.0	2.2	0.3	0.0	2.9	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.8	1.6	1.0	0.5	0.0	0.7	4.9	0.0	0.9	3.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.2	30.3	35.0	33.3	26.1	0.0	33.7	12.7	0.0	34.3	10.9	0.0
LnGrp LOS	D	C	C	C	C		C	B		C	B	
Approach Vol, veh/h		163			247	A		2087	A		1636	A
Approach Delay, s/veh		33.6			31.4			13.5			12.4	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.9	39.6	9.5	10.9	8.4	40.1	6.3	14.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.8	41.6	6.6	18.0	7.7	39.7	5.0	19.6
Max Q Clear Time (g_c+I1), s	4.5	18.6	5.1	6.0	3.8	13.1	2.5	3.2
Green Ext Time (p_c), s	0.0	16.5	0.1	0.5	0.1	13.5	0.0	0.2

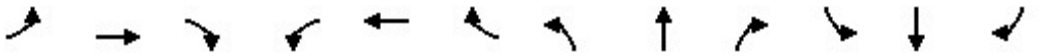
Intersection Summary	
HCM 6th Ctrl Delay	14.9
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.850			0.973			0.994			0.989	
Flt Protected					0.971		0.950			0.950		
Satd. Flow (prot)	1676	1425	0	0	1667	0	1676	4789	0	1676	4765	0
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	1676	1425	0	0	1717	0	1676	4789	0	1676	4765	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		574			1			8			16	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



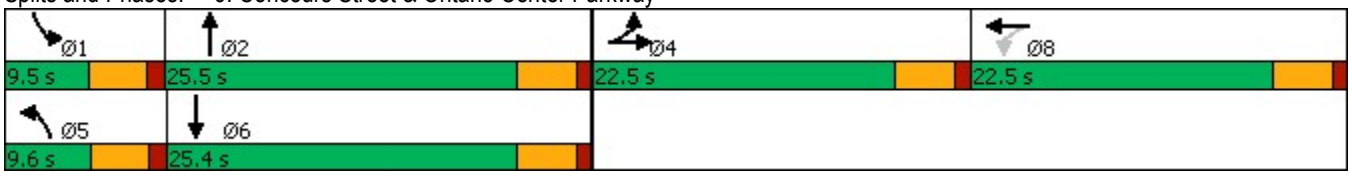
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	0	3	3	1	1	38	495	21	1	683	56
Future Volume (vph)	0	0	3	3	1	1	38	495	21	1	683	56
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	0	3	3	1	1	42	550	23	1	759	62
Shared Lane Traffic (%)	0%											
Lane Group Flow (vph)	0	3	0	0	5	0	42	573	0	1	821	0

Intersection Summary

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	0	3	1	38	495	1	683
Future Volume (vph)	0	3	1	38	495	1	683
Turn Type	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	4		8	5	2	1	6
Permitted Phases		8					
Detector Phase	4	8	8	5	2	1	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	22.5	9.6	25.5	9.5	25.4
Total Split (%)	28.1%	28.1%	28.1%	12.0%	31.9%	11.9%	31.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag				Lead	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	None	Min
Act Effct Green (s)	6.0		6.1	5.5	32.9	5.4	30.4
Actuated g/C Ratio	0.16		0.16	0.15	0.88	0.14	0.81
v/c Ratio	0.00		0.02	0.17	0.14	0.00	0.21
Control Delay	0.0		18.8	21.2	3.7	21.0	4.5
Queue Delay	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	0.0		18.8	21.2	3.7	21.0	4.5
LOS	A		B	C	A	C	A
Approach Delay			18.8		4.9		4.5
Approach LOS			B		A		A

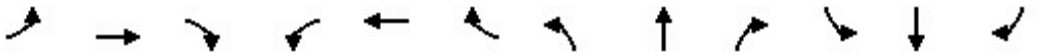
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 37.4	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.21	
Intersection Signal Delay: 4.7	Intersection LOS: A
Intersection Capacity Utilization 34.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	3	5	42	573	1	821
v/c Ratio	0.00	0.02	0.17	0.14	0.00	0.21
Control Delay	0.0	18.8	21.2	3.7	21.0	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.0	18.8	21.2	3.7	21.0	4.5
Queue Length 50th (ft)	0	1	6	0	0	0
Queue Length 95th (ft)	0	10	39	68	4	99
Internal Link Dist (ft)	319	68		111		176
Turn Bay Length (ft)			115		120	
Base Capacity (vph)	1018	897	248	4214	243	3877
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.01	0.17	0.14	0.00	0.21

Intersection Summary



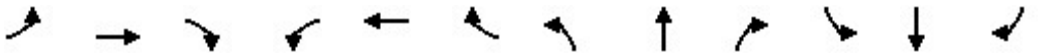
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	3	3	1	1	38	495	21	1	683	56
Future Volume (veh/h)	0	0	3	3	1	1	38	495	21	1	683	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	0	0	3	3	1	1	42	550	23	1	759	62
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	7	0	6	7	2	2	83	1902	79	6	1604	130
Arrive On Green	0.00	0.00	0.00	0.01	0.01	0.01	0.05	0.40	0.40	0.00	0.35	0.35
Sat Flow, veh/h	1688	0	1502	997	332	332	1688	4763	198	1688	4560	371
Grp Volume(v), veh/h	0	0	3	5	0	0	42	371	202	1	536	285
Grp Sat Flow(s),veh/h/ln	1688	0	1502	1662	0	0	1688	1612	1736	1688	1612	1705
Q Serve(g_s), s	0.0	0.0	0.1	0.1	0.0	0.0	0.7	2.4	2.4	0.0	4.0	4.0
Cycle Q Clear(g_c), s	0.0	0.0	0.1	0.1	0.0	0.0	0.7	2.4	2.4	0.0	4.0	4.0
Prop In Lane	1.00		1.00	0.60		0.20	1.00		0.11	1.00		0.22
Lane Grp Cap(c), veh/h	7	0	6	11	0	0	83	1288	693	6	1134	600
V/C Ratio(X)	0.00	0.00	0.49	0.44	0.00	0.00	0.51	0.29	0.29	0.18	0.47	0.48
Avail Cap(c_a), veh/h	993	0	883	978	0	0	281	2214	1192	276	2203	1165
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	15.2	15.1	0.0	0.0	14.2	6.2	6.2	15.2	7.7	7.7
Incr Delay (d2), s/veh	0.0	0.0	49.0	24.8	0.0	0.0	4.7	0.1	0.2	15.0	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	0.1	0.0	0.0	0.3	0.5	0.5	0.0	0.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	64.2	40.0	0.0	0.0	18.9	6.4	6.5	30.2	8.0	8.3
LnGrp LOS	A	A	E	D	A	A	B	A	A	C	A	A
Approach Vol, veh/h		3			5			615			822	
Approach Delay, s/veh		64.2			40.0			7.3			8.1	
Approach LOS		E			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.5	16.7		4.6	6.0	15.3		4.7				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	21.0		18.0	5.1	20.9		18.0				
Max Q Clear Time (g_c+I1), s	2.0	4.4		2.1	2.7	6.0		2.1				
Green Ext Time (p_c), s	0.0	3.4		0.0	0.0	4.8		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		8.0
HCM 6th LOS		A

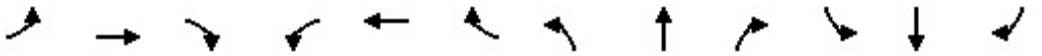
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			234			234			234			273
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



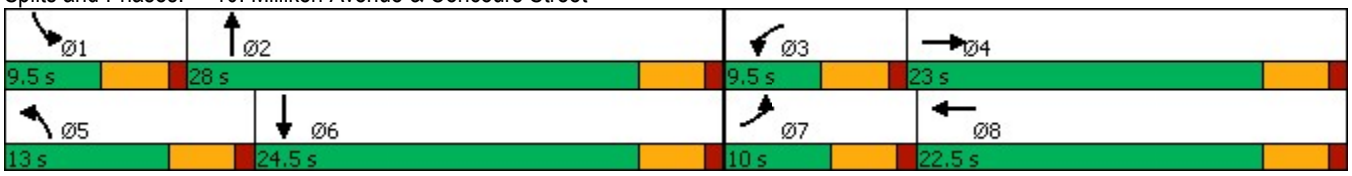
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	70	24	51	49	78	40	155	938	59	53	899	235
Future Volume (vph)	70	24	51	49	78	40	155	938	59	53	899	235
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	81	28	59	57	91	47	180	1091	69	62	1045	273
Shared Lane Traffic (%)												
Lane Group Flow (vph)	81	28	59	57	91	47	180	1091	69	62	1045	273

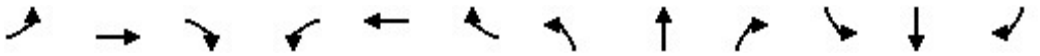
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	24	51	49	78	40	155	938	59	53	899	235
Future Volume (vph)	70	24	51	49	78	40	155	938	59	53	899	235
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	10.0	23.0		9.5	22.5		13.0	28.0		9.5	24.5	
Total Split (%)	14.3%	32.9%		13.6%	32.1%		18.6%	40.0%		13.6%	35.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	5.9	9.1	50.4	5.4	7.2	50.4	8.3	28.5	50.4	5.4	23.9	50.4
Actuated g/C Ratio	0.12	0.18	1.00	0.11	0.14	1.00	0.16	0.57	1.00	0.11	0.47	1.00
v/c Ratio	0.24	0.05	0.04	0.18	0.19	0.03	0.38	0.32	0.05	0.20	0.36	0.18
Control Delay	26.6	21.1	0.1	26.7	23.7	0.1	24.9	10.5	0.1	26.8	13.7	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.6	21.1	0.1	26.7	23.7	0.1	24.9	10.5	0.1	26.8	13.7	0.3
LOS	C	C	A	C	C	A	C	B	A	C	B	A
Approach Delay		16.4			18.9			11.9			11.6	
Approach LOS		B			B			B			B	

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 50.4	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.38	
Intersection Signal Delay: 12.5	Intersection LOS: B
Intersection Capacity Utilization 39.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 10: Milliken Avenue & Concours Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	81	28	59	57	91	47	180	1091	69	62	1045	273
v/c Ratio	0.24	0.05	0.04	0.18	0.19	0.03	0.38	0.32	0.05	0.20	0.36	0.18
Control Delay	26.6	21.1	0.1	26.7	23.7	0.1	24.9	10.5	0.1	26.8	13.7	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.6	21.1	0.1	26.7	23.7	0.1	24.9	10.5	0.1	26.8	13.7	0.3
Queue Length 50th (ft)	13	3	0	9	15	0	29	79	0	10	84	0
Queue Length 95th (ft)	31	14	0	24	32	0	55	103	0	25	109	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	340	1326	1500	309	1290	1500	525	3451	1500	309	2987	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.02	0.04	0.18	0.07	0.03	0.34	0.32	0.05	0.20	0.35	0.18

Intersection Summary

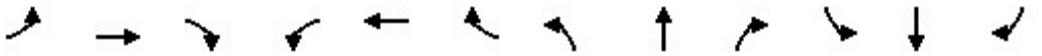
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	24	51	49	78	40	155	938	59	53	899	235
Future Volume (veh/h)	70	24	51	49	78	40	155	938	59	53	899	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	81	28	0	57	91	0	180	1091	0	62	1045	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	208	388		166	339		295	2173		176	1923	
Arrive On Green	0.07	0.12	0.00	0.06	0.10	0.00	0.10	0.36	0.00	0.06	0.32	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	81	28	0	57	91	0	180	1091	0	62	1045	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	1.2	0.3	0.0	0.8	1.1	0.0	2.6	6.1	0.0	0.9	6.2	0.0
Cycle Q Clear(g_c), s	1.2	0.3	0.0	0.8	1.1	0.0	2.6	6.1	0.0	0.9	6.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	208	388		166	339		295	2173		176	1923	
V/C Ratio(X)	0.39	0.07		0.34	0.27		0.61	0.50		0.35	0.54	
Avail Cap(c_a), veh/h	365	1422		332	1383		565	3270		332	2783	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.4	17.3	0.0	19.9	18.2	0.0	18.9	11.1	0.0	19.8	12.4	0.0
Incr Delay (d2), s/veh	1.2	0.1	0.0	1.2	0.4	0.0	2.0	0.2	0.0	1.2	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.1	0.0	0.3	0.4	0.0	0.9	1.7	0.0	0.3	1.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.6	17.4	0.0	21.1	18.6	0.0	20.9	11.2	0.0	21.0	12.6	0.0
LnGrp LOS	C	B		C	B		C	B		C	B	
Approach Vol, veh/h		109	A		148	A		1271	A		1107	A
Approach Delay, s/veh		19.8			19.6			12.6			13.1	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	20.1	7.0	9.5	8.9	18.3	7.6	8.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	23.5	5.0	18.5	8.5	20.0	5.5	18.0
Max Q Clear Time (g_c+I1), s	2.9	8.1	2.8	2.3	4.6	8.2	3.2	3.1
Green Ext Time (p_c), s	0.0	6.9	0.0	0.1	0.2	5.6	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	13.5
HCM 6th LOS	B

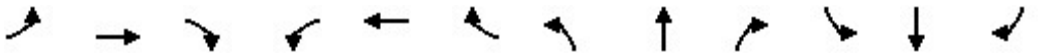
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			236			437			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



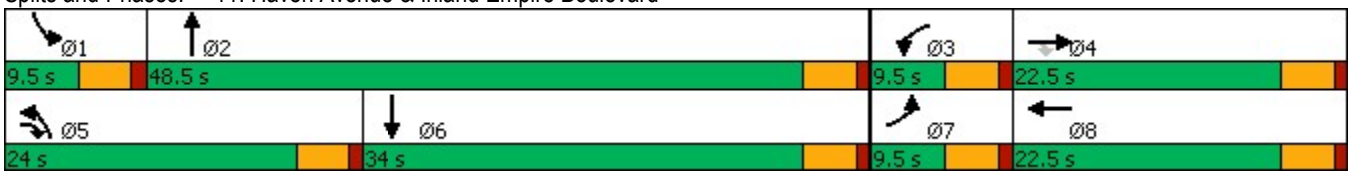
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	53	98	239	118	103	21	460	2080	647	52	1354	75
Future Volume (vph)	53	98	239	118	103	21	460	2080	647	52	1354	75
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	57	105	257	127	111	23	495	2237	696	56	1456	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	105	257	127	111	23	495	2237	696	56	1456	81

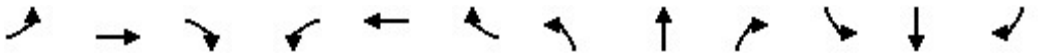
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	98	239	118	103	21	460	2080	647	52	1354	75
Future Volume (vph)	53	98	239	118	103	21	460	2080	647	52	1354	75
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	24.0	9.5	22.5		24.0	48.5		9.5	34.0	
Total Split (%)	10.6%	25.0%	26.7%	10.6%	25.0%		26.7%	53.9%		10.6%	37.8%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.4	8.2	27.1	5.4	10.0	71.8	17.7	47.3	71.8	5.4	28.2	71.8
Actuated g/C Ratio	0.08	0.11	0.38	0.08	0.14	1.00	0.25	0.66	1.00	0.08	0.39	1.00
v/c Ratio	0.26	0.28	0.42	0.43	0.24	0.02	0.70	0.56	0.46	0.26	0.61	0.05
Control Delay	39.5	35.0	14.3	41.5	33.3	0.0	32.8	11.2	1.0	39.5	20.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.5	35.0	14.3	41.5	33.3	0.0	32.8	11.2	1.0	39.5	20.6	0.1
LOS	D	C	B	D	C	A	C	B	A	D	C	A
Approach Delay		22.9			34.4			12.2			20.2	
Approach LOS		C			C			B			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 71.8	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 16.3	Intersection LOS: B
Intersection Capacity Utilization 57.1%	ICU Level of Service B
Analysis Period (min) 15	

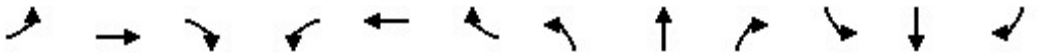
Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	105	257	127	111	23	495	2237	696	56	1456	81
v/c Ratio	0.26	0.28	0.42	0.43	0.24	0.02	0.70	0.56	0.46	0.26	0.61	0.05
Control Delay	39.5	35.0	14.3	41.5	33.3	0.0	32.8	11.2	1.0	39.5	20.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.5	35.0	14.3	41.5	33.3	0.0	32.8	11.2	1.0	39.5	20.6	0.1
Queue Length 50th (ft)	14	26	61	22	27	0	116	214	0	13	172	0
Queue Length 95th (ft)	32	50	120	41	52	0	174	271	0	32	219	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	216	903	675	294	903	1500	843	3996	1500	216	2679	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.12	0.38	0.43	0.12	0.02	0.59	0.56	0.46	0.26	0.54	0.05

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	98	239	118	103	21	460	2080	647	52	1354	75
Future Volume (veh/h)	53	98	239	118	103	21	460	2080	647	52	1354	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	57	105	257	127	111	0	495	2237	0	56	1456	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	131	557	548	233	604		580	3084		130	2141	
Arrive On Green	0.04	0.17	0.17	0.06	0.18	0.00	0.20	0.51	0.00	0.04	0.35	0.00
Sat Flow, veh/h	2910	3367	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	57	105	257	127	111	0	495	2237	0	56	1456	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	1.5	2.1	10.5	2.5	2.2	0.0	13.1	22.9	0.0	1.5	16.3	0.0
Cycle Q Clear(g_c), s	1.5	2.1	10.5	2.5	2.2	0.0	13.1	22.9	0.0	1.5	16.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	131	557	548	233	604		580	3084		130	2141	
V/C Ratio(X)	0.44	0.19	0.47	0.54	0.18		0.85	0.73		0.43	0.68	
Avail Cap(c_a), veh/h	182	758	637	248	758		710	3354		182	2249	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	37.2	28.7	19.5	36.6	27.8	0.0	30.9	15.4	0.0	37.2	22.1	0.0
Incr Delay (d2), s/veh	2.3	0.2	0.6	2.1	0.1	0.0	8.4	0.7	0.0	2.3	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.9	3.6	0.8	0.9	0.0	5.1	7.3	0.0	0.6	5.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.5	28.9	20.1	38.7	28.0	0.0	39.3	16.1	0.0	39.5	22.9	0.0
LnGrp LOS	D	C	C	D	C		D	B		D	C	
Approach Vol, veh/h		419			238	A		2732	A		1512	A
Approach Delay, s/veh		24.9			33.7			20.3			23.5	
Approach LOS		C			C			C			C	

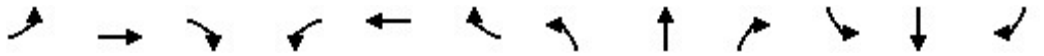
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	45.0	9.2	17.7	20.4	32.6	8.1	18.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	44.0	5.0	18.0	19.5	29.5	5.0	18.0
Max Q Clear Time (g_c+I1), s	3.5	24.9	4.5	12.5	15.1	18.3	3.5	4.2
Green Ext Time (p_c), s	0.0	15.6	0.0	0.8	0.8	7.3	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	22.4
HCM 6th LOS	C

Notes

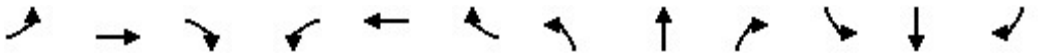
User approved changes to right turn type.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			236			236			236			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



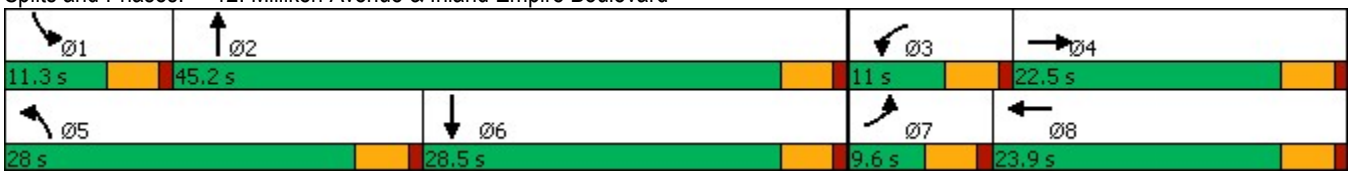
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	63	33	52	99	78	20	406	1050	110	32	824	130
Future Volume (vph)	63	33	52	99	78	20	406	1050	110	32	824	130
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	73	38	60	115	91	23	472	1221	128	37	958	151
Shared Lane Traffic (%)												
Lane Group Flow (vph)	73	38	60	115	91	23	472	1221	128	37	958	151

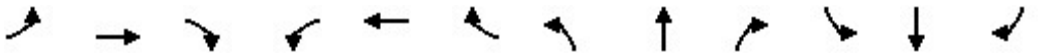
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	33	52	99	78	20	406	1050	110	32	824	130
Future Volume (vph)	63	33	52	99	78	20	406	1050	110	32	824	130
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.6	22.5		11.0	23.9		28.0	45.2		11.3	28.5	
Total Split (%)	10.7%	25.0%		12.2%	26.6%		31.1%	50.2%		12.6%	31.7%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	5.8	7.1	61.1	9.1	8.0	61.1	16.2	38.6	61.1	6.9	19.0	61.1
Actuated g/C Ratio	0.09	0.12	1.00	0.15	0.13	1.00	0.27	0.63	1.00	0.11	0.31	1.00
v/c Ratio	0.27	0.10	0.04	0.27	0.21	0.02	0.62	0.32	0.09	0.11	0.51	0.10
Control Delay	34.9	31.0	0.1	32.0	30.5	0.0	26.0	8.9	0.1	31.8	20.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	31.0	0.1	32.0	30.5	0.0	26.0	8.9	0.1	31.8	20.2	0.1
LOS	C	C	A	C	C	A	C	A	A	C	C	A
Approach Delay		21.8			28.2			12.7			17.9	
Approach LOS		C			C			B			B	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 61.1		
Natural Cycle: 70		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.62		
Intersection Signal Delay: 16.0	Intersection LOS: B	
Intersection Capacity Utilization 47.6%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	73	38	60	115	91	23	472	1221	128	37	958	151
v/c Ratio	0.27	0.10	0.04	0.27	0.21	0.02	0.62	0.32	0.09	0.11	0.51	0.10
Control Delay	34.9	31.0	0.1	32.0	30.5	0.0	26.0	8.9	0.1	31.8	20.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	31.0	0.1	32.0	30.5	0.0	26.0	8.9	0.1	31.8	20.2	0.1
Queue Length 50th (ft)	14	7	0	23	17	0	88	62	0	7	94	0
Queue Length 95th (ft)	36	22	0	51	41	0	140	120	0	22	135	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	275	1129	1500	445	1218	1500	1272	4095	1500	368	2728	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.03	0.04	0.26	0.07	0.02	0.37	0.30	0.09	0.10	0.35	0.10

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	33	52	99	78	20	406	1050	110	32	824	130
Future Volume (veh/h)	63	33	52	99	78	20	406	1050	110	32	824	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	73	38	0	115	91	0	472	1221	0	37	958	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	180	299		223	348		630	2796		115	1717	
Arrive On Green	0.06	0.09	0.00	0.08	0.10	0.00	0.22	0.46	0.00	0.04	0.28	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	73	38	0	115	91	0	472	1221	0	37	958	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	1.3	0.6	0.0	2.0	1.3	0.0	8.1	7.3	0.0	0.7	7.2	0.0
Cycle Q Clear(g_c), s	1.3	0.6	0.0	2.0	1.3	0.0	8.1	7.3	0.0	0.7	7.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	180	299		223	348		630	2796		115	1717	
V/C Ratio(X)	0.41	0.13		0.52	0.26		0.75	0.44		0.32	0.56	
Avail Cap(c_a), veh/h	277	1133		354	1221		1278	4637		370	2734	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.1	22.5	0.0	23.8	22.1	0.0	19.6	9.8	0.0	25.0	16.4	0.0
Incr Delay (d2), s/veh	1.5	0.2	0.0	1.8	0.4	0.0	1.8	0.1	0.0	1.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.2	0.0	0.7	0.5	0.0	2.6	2.0	0.0	0.2	2.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.6	22.7	0.0	25.6	22.5	0.0	21.4	9.9	0.0	26.6	16.7	0.0
LnGrp LOS	C	C		C	C		C	A		C	B	
Approach Vol, veh/h		111	A		206	A		1693	A		995	A
Approach Delay, s/veh		24.6			24.2			13.1			17.0	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.6	29.0	8.6	9.3	16.1	19.6	7.8	10.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.8	40.7	6.5	18.0	23.5	24.0	5.1	19.4
Max Q Clear Time (g_c+I1), s	2.7	9.3	4.0	2.6	10.1	9.2	3.3	3.3
Green Ext Time (p_c), s	0.0	10.9	0.1	0.1	1.5	5.9	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	15.6
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.943	0.850				
Flt Protected	0.970					
Satd. Flow (prot)	2958	1365	6071	0	0	6071
Flt Permitted	0.970					
Satd. Flow (perm)	2958	1365	6071	0	0	6071
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	1	1				
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

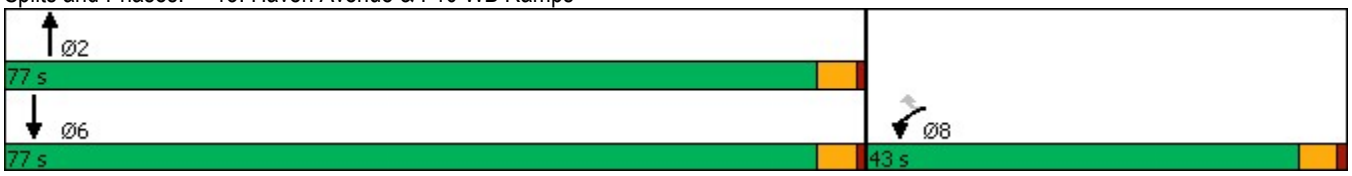
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	496	679	2604	0	0	1538
Future Volume (vph)	496	679	2604	0	0	1538
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	545	746	2862	0	0	1690
Shared Lane Traffic (%)		45%				
Lane Group Flow (vph)	881	410	2862	0	0	1690

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	496	679	2604	1538
Future Volume (vph)	496	679	2604	1538
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	43.0	43.0	77.0	77.0
Total Split (%)	35.8%	35.8%	64.2%	64.2%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	37.6	37.6	72.5	72.5
Actuated g/C Ratio	0.32	0.32	0.61	0.61
v/c Ratio	0.94	0.95	0.77	0.46
Control Delay	58.7	73.4	19.2	13.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	58.7	73.4	19.2	13.2
LOS	E	E	B	B
Approach Delay	63.4		19.2	13.2
Approach LOS	E		B	B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.1	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 27.3	Intersection LOS: C
Intersection Capacity Utilization 79.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps



Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	881	410	2862	1690
v/c Ratio	0.94	0.95	0.77	0.46
Control Delay	58.7	73.4	19.2	13.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	58.7	73.4	19.2	13.2
Queue Length 50th (ft)	338	337	453	196
Queue Length 95th (ft)	#464	#558	500	223
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	957	442	3696	3696
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.92	0.93	0.77	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

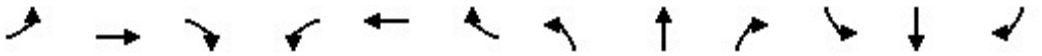
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	496	679	2604	0	0	1538
Future Volume (veh/h)	496	679	2604	0	0	1538
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1673	1772	1772	0	0	1772
Adj Flow Rate, veh/h	430	869	2862	0	0	1690
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	504	950	3690	0	0	3690
Arrive On Green	0.32	0.32	0.61	0.00	0.00	0.61
Sat Flow, veh/h	1594	3003	6592	0	0	6592
Grp Volume(v), veh/h	430	869	2862	0	0	1690
Grp Sat Flow(s),veh/h/ln	1594	1502	1524	0	0	1524
Q Serve(g_s), s	29.0	32.0	40.1	0.0	0.0	17.4
Cycle Q Clear(g_c), s	29.0	32.0	40.1	0.0	0.0	17.4
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	504	950	3690	0	0	3690
V/C Ratio(X)	0.85	0.91	0.78	0.00	0.00	0.46
Avail Cap(c_a), veh/h	534	1007	3848	0	0	3848
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	36.8	37.8	16.9	0.0	0.0	12.4
Incr Delay (d2), s/veh	12.1	12.1	1.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.8	13.2	13.4	0.0	0.0	5.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	48.9	49.9	17.9	0.0	0.0	12.5
LnGrp LOS	D	D	B	A	A	B
Approach Vol, veh/h	1299		2862			1690
Approach Delay, s/veh	49.6		17.9			12.5
Approach LOS	D		B			B

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		74.0			74.0	40.8
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		72.5			72.5	38.5
Max Q Clear Time (g_c+I1), s		42.1			19.4	34.0
Green Ext Time (p_c), s		27.4			21.0	2.4

Intersection Summary	
HCM 6th Ctrl Delay	23.3
HCM 6th LOS	C

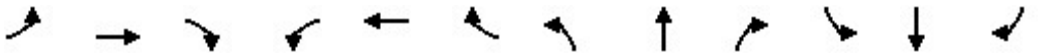
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			266			182			338			235
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



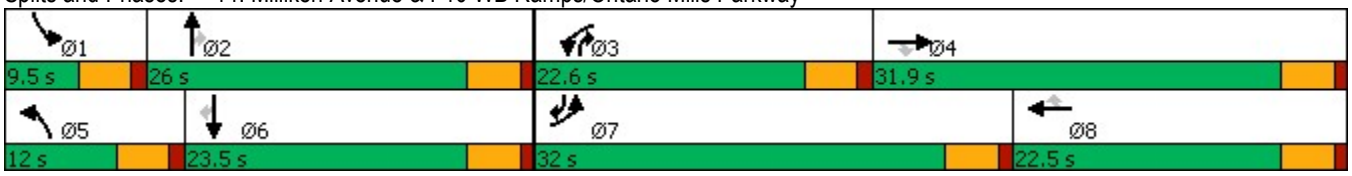
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	587	89	237	162	185	34	154	894	301	83	546	253
Future Volume (vph)	587	89	237	162	185	34	154	894	301	83	546	253
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	660	100	266	182	208	38	173	1004	338	93	613	284
Shared Lane Traffic (%)												
Lane Group Flow (vph)	660	100	266	182	208	38	173	1004	338	93	613	284

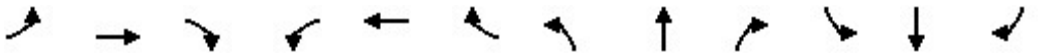
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	587	89	237	162	185	34	154	894	301	83	546	253
Future Volume (vph)	587	89	237	162	185	34	154	894	301	83	546	253
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	32.0	31.9	31.9	22.6	22.5	22.5	12.0	26.0	22.6	9.5	23.5	32.0
Total Split (%)	35.6%	35.4%	35.4%	25.1%	25.0%	25.0%	13.3%	28.9%	25.1%	10.6%	26.1%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	22.3	22.1	22.1	10.4	10.2	10.2	7.6	21.4	36.4	5.1	16.4	43.3
Actuated g/C Ratio	0.30	0.30	0.30	0.14	0.14	0.14	0.10	0.29	0.49	0.07	0.22	0.58
v/c Ratio	0.77	0.19	0.42	0.46	0.46	0.11	0.59	0.58	0.37	0.47	0.46	0.29
Control Delay	31.2	22.0	5.4	35.2	35.0	0.6	44.7	26.1	3.0	45.7	27.3	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.2	22.0	5.4	35.2	35.0	0.6	44.7	26.1	3.0	45.7	27.3	2.7
LOS	C	C	A	D	D	A	D	C	A	D	C	A
Approach Delay		23.6			32.0			23.1			21.9	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 74.9	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 23.9	Intersection LOS: C
Intersection Capacity Utilization 58.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway

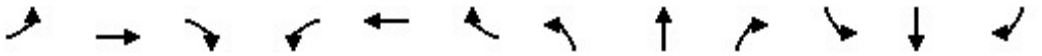




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	660	100	266	182	208	38	173	1004	338	93	613	284
v/c Ratio	0.77	0.19	0.42	0.46	0.46	0.11	0.59	0.58	0.37	0.47	0.46	0.29
Control Delay	31.2	22.0	5.4	35.2	35.0	0.6	44.7	26.1	3.0	45.7	27.3	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.2	22.0	5.4	35.2	35.0	0.6	44.7	26.1	3.0	45.7	27.3	2.7
Queue Length 50th (ft)	149	36	0	43	50	0	42	123	0	23	73	9
Queue Length 95th (ft)	216	76	51	74	85	0	#88	173	41	#52	109	40
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	1088	662	728	716	826	506	296	1787	1030	197	1579	1066
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.15	0.37	0.25	0.25	0.08	0.58	0.56	0.33	0.47	0.39	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	587	89	237	162	185	34	154	894	301	83	546	253
Future Volume (veh/h)	587	89	237	162	185	34	154	894	301	83	546	253
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	660	100	266	182	208	38	173	1004	338	93	613	284
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	800	507	430	274	355	158	250	1721	565	181	1578	801
Arrive On Green	0.27	0.29	0.29	0.09	0.11	0.11	0.09	0.28	0.28	0.06	0.26	0.26
Sat Flow, veh/h	2910	1772	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	660	100	266	182	208	38	173	1004	338	93	613	284
Grp Sat Flow(s),veh/h/ln	1455	1772	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	13.9	2.8	10.1	4.0	3.9	1.5	3.8	9.3	11.8	2.0	5.4	7.1
Cycle Q Clear(g_c), s	13.9	2.8	10.1	4.0	3.9	1.5	3.8	9.3	11.8	2.0	5.4	7.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	800	507	430	274	355	158	250	1721	565	181	1578	801
V/C Ratio(X)	0.83	0.20	0.62	0.66	0.59	0.24	0.69	0.58	0.60	0.51	0.39	0.35
Avail Cap(c_a), veh/h	1223	742	629	805	926	413	334	2003	635	222	1770	849
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.3	17.7	20.3	28.6	27.9	26.9	29.1	20.2	16.4	29.7	20.0	8.8
Incr Delay (d2), s/veh	2.9	0.2	1.5	2.8	1.5	0.8	3.9	0.3	1.3	2.2	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	1.1	3.4	1.4	1.6	0.6	1.4	3.1	3.9	0.7	1.8	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.1	17.9	21.7	31.4	29.4	27.6	32.9	20.5	17.7	31.9	20.1	9.0
LnGrp LOS	C	B	C	C	C	C	C	C	B	C	C	A
Approach Vol, veh/h		1026			428			1515			990	
Approach Delay, s/veh		23.5			30.1			21.3			18.1	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	23.0	10.7	23.2	10.1	21.4	22.5	11.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	21.5	18.1	27.4	7.5	19.0	27.5	18.0
Max Q Clear Time (g_c+I1), s	4.0	13.8	6.0	12.1	5.8	9.1	15.9	5.9
Green Ext Time (p_c), s	0.0	4.6	0.4	1.3	0.1	3.7	2.1	1.0

Intersection Summary	
HCM 6th Ctrl Delay	22.0
HCM 6th LOS	C

Notes

User approved changes to right turn type.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.993	0.850				
Flt Protected	0.954					
Satd. Flow (prot)	3063	1365	0	6071	6071	0
Flt Permitted	0.954					
Satd. Flow (perm)	3063	1365	0	6071	6071	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	3	3				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

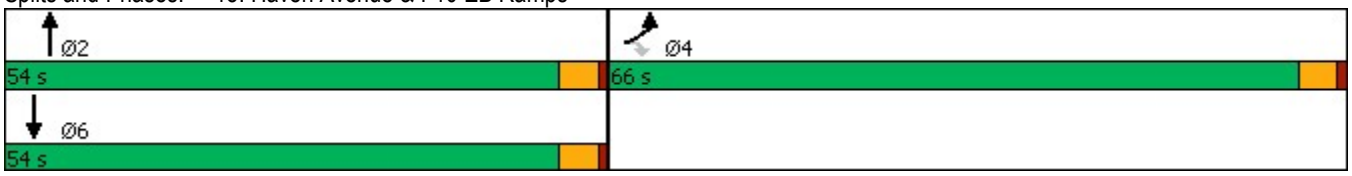
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	1238	583	0	1695	1526	0
Future Volume (vph)	1238	583	0	1695	1526	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1391	655	0	1904	1715	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	1457	589	0	1904	1715	0

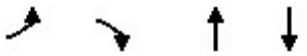
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1238	583	1695	1526
Future Volume (vph)	1238	583	1695	1526
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	66.0	66.0	54.0	54.0
Total Split (%)	55.0%	55.0%	45.0%	45.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	59.1	59.1	48.1	48.1
Actuated g/C Ratio	0.51	0.51	0.41	0.41
v/c Ratio	0.93	0.85	0.76	0.68
Control Delay	39.2	38.0	31.8	29.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	39.2	38.0	31.8	29.8
LOS	D	D	C	C
Approach Delay	38.8		31.8	29.8
Approach LOS	D		C	C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 116.2	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 33.7	Intersection LOS: C
Intersection Capacity Utilization 79.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1457	589	1904	1715
v/c Ratio	0.93	0.85	0.76	0.68
Control Delay	39.2	38.0	31.8	29.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	39.2	38.0	31.8	29.8
Queue Length 50th (ft)	521	413	361	311
Queue Length 95th (ft)	#678	#651	401	348
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	1630	727	2599	2599
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.89	0.81	0.73	0.66

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1238	583	0	1695	1526	0
Future Volume (veh/h)	1238	583	0	1695	1526	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1772	0	1772	1772	0
Adj Flow Rate, veh/h	1391	655	0	1904	1715	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	1583	746	0	2544	2544	0
Arrive On Green	0.50	0.50	0.00	0.42	0.42	0.00
Sat Flow, veh/h	3188	1502	0	6592	6592	0
Grp Volume(v), veh/h	1391	655	0	1904	1715	0
Grp Sat Flow(s),veh/h/ln	1594	1502	0	1524	1524	0
Q Serve(g_s), s	40.9	40.8	0.0	27.8	23.9	0.0
Cycle Q Clear(g_c), s	40.9	40.8	0.0	27.8	23.9	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	1583	746	0	2544	2544	0
V/C Ratio(X)	0.88	0.88	0.00	0.75	0.67	0.00
Avail Cap(c_a), veh/h	1869	880	0	2876	2876	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.6	23.6	0.0	25.9	24.8	0.0
Incr Delay (d2), s/veh	4.5	8.9	0.0	1.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.5	15.5	0.0	9.9	8.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.1	32.5	0.0	26.9	25.3	0.0
LnGrp LOS	C	C	A	C	C	A
Approach Vol, veh/h	2046			1904	1715	
Approach Delay, s/veh	29.5			26.9	25.3	
Approach LOS	C			C	C	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		48.3		56.6		48.3
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		49.5		61.5		49.5
Max Q Clear Time (g_c+I1), s		29.8		42.9		25.9
Green Ext Time (p_c), s		14.0		9.2		14.3

Intersection Summary		
HCM 6th Ctrl Delay	27.4	
HCM 6th LOS	C	

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1600	1800	1600	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2891	1500	2891	6071	6071	1500
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2891	1500	2891	6071	6071	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		5				264
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	654	587	159	698	727	230
Future Volume (vph)	654	587	159	698	727	230
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	752	675	183	802	836	264
Shared Lane Traffic (%)						
Lane Group Flow (vph)	752	675	183	802	836	264

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	654	587	159	698	727	230
Future Volume (vph)	654	587	159	698	727	230
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	38.0	28.0	28.0	52.0	24.0	38.0
Total Split (%)	42.2%	31.1%	31.1%	57.8%	26.7%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	23.3	40.4	12.3	33.5	16.5	44.5
Actuated g/C Ratio	0.35	0.61	0.19	0.51	0.25	0.67
v/c Ratio	0.74	0.74	0.34	0.26	0.55	0.24
Control Delay	24.8	14.8	27.0	10.0	24.9	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.8	14.8	27.0	10.0	24.9	1.4
LOS	C	B	C	A	C	A
Approach Delay	20.1			13.1	19.2	
Approach LOS	C			B	B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 66.3	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 17.9	Intersection LOS: B
Intersection Capacity Utilization 57.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

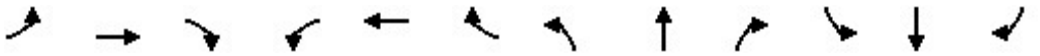
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	752	675	183	802	836	264
v/c Ratio	0.74	0.74	0.34	0.26	0.55	0.24
Control Delay	24.8	14.8	27.0	10.0	24.9	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.8	14.8	27.0	10.0	24.9	1.4
Queue Length 50th (ft)	129	171	34	50	82	0
Queue Length 95th (ft)	237	282	67	83	153	22
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	1537	1194	1078	4539	1879	1300
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.57	0.17	0.18	0.44	0.20

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	654	587	159	698	727	230
Future Volume (veh/h)	654	587	159	698	727	230
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1772	1575	1772	1772	1772
Adj Flow Rate, veh/h	752	675	183	802	836	264
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1336	835	282	2422	1395	1033
Arrive On Green	0.46	0.46	0.10	0.40	0.23	0.23
Sat Flow, veh/h	2910	1502	2910	6343	6343	1502
Grp Volume(v), veh/h	752	675	183	802	836	264
Grp Sat Flow(s),veh/h/ln	1455	1502	1455	1524	1524	1502
Q Serve(g_s), s	11.8	22.7	3.8	5.7	7.7	4.2
Cycle Q Clear(g_c), s	11.8	22.7	3.8	5.7	7.7	4.2
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1336	835	282	2422	1395	1033
V/C Ratio(X)	0.56	0.81	0.65	0.33	0.60	0.26
Avail Cap(c_a), veh/h	1554	947	1090	4615	1895	1156
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.4	11.2	27.3	13.1	21.6	3.7
Incr Delay (d2), s/veh	0.4	4.7	2.5	0.1	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	1.1	1.4	1.8	2.6	3.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.7	16.0	29.8	13.2	22.0	3.8
LnGrp LOS	B	B	C	B	C	A
Approach Vol, veh/h	1427			985	1100	
Approach Delay, s/veh	14.3			16.3	17.7	
Approach LOS	B			B	B	

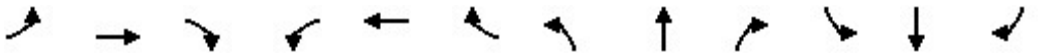
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		29.4		33.3	10.6	18.9
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		47.5		33.5	23.5	19.5
Max Q Clear Time (g_c+I1), s		7.7		24.7	5.8	9.7
Green Ext Time (p_c), s		6.7		4.1	0.5	4.7

Intersection Summary	
HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.964				0.850			0.850		0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4644	0	2891	3353	1500	2891	4818	1500	2891	5888	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4644	0	2891	3353	1500	2891	4818	1500	2891	5888	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		65				136			177		65	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	364	687	216	123	588	102	252	1527	178	146	1469	370
Future Volume (vph)	364	687	216	123	588	102	252	1527	178	146	1469	370
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	396	747	235	134	639	111	274	1660	193	159	1597	402
Shared Lane Traffic (%)												
Lane Group Flow (vph)	396	982	0	134	639	111	274	1660	193	159	1999	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	364	687	123	588	102	252	1527	178	146	1469
Future Volume (vph)	364	687	123	588	102	252	1527	178	146	1469
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	22.0	37.0	14.0	29.0	29.0	14.0	57.0		12.0	55.0
Total Split (%)	18.3%	30.8%	11.7%	24.2%	24.2%	11.7%	47.5%		10.0%	45.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	17.5	32.9	9.1	24.5	24.5	9.5	52.5	120.0	7.5	50.5
Actuated g/C Ratio	0.15	0.27	0.08	0.20	0.20	0.08	0.44	1.00	0.06	0.42
v/c Ratio	0.94	0.74	0.61	0.93	0.27	1.20	0.79	0.13	0.88	0.79
Control Delay	82.3	41.2	66.0	68.9	5.4	171.6	32.4	0.2	98.2	32.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.3	41.2	66.0	68.9	5.4	171.6	32.4	0.2	98.2	32.1
LOS	F	D	E	E	A	F	C	A	F	C
Approach Delay		53.0		60.5			47.4			37.0
Approach LOS		D		E			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 46.9	Intersection LOS: D
Intersection Capacity Utilization 82.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Haven Avenue & 4th Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	396	982	134	639	111	274	1660	193	159	1999
v/c Ratio	0.94	0.74	0.61	0.93	0.27	1.20	0.79	0.13	0.88	0.79
Control Delay	82.3	41.2	66.0	68.9	5.4	171.6	32.4	0.2	98.2	32.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.3	41.2	66.0	68.9	5.4	171.6	32.4	0.2	98.2	32.1
Queue Length 50th (ft)	158	239	52	258	0	~132	396	0	64	374
Queue Length 95th (ft)	#255	293	86	#371	32	#221	458	0	#129	423
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	421	1319	228	684	414	228	2107	1500	180	2515
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.74	0.59	0.93	0.27	1.20	0.79	0.13	0.88	0.79

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

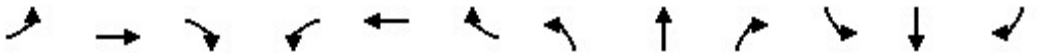
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	364	687	216	123	588	102	252	1527	178	146	1469	370
Future Volume (veh/h)	364	687	216	123	588	102	252	1527	178	146	1469	370
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	396	747	235	134	639	111	274	1660	0	159	1597	402
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	425	1052	327	180	686	306	231	2117		182	2059	518
Arrive On Green	0.15	0.29	0.29	0.06	0.20	0.20	0.08	0.44	0.00	0.06	0.42	0.42
Sat Flow, veh/h	2910	3655	1137	2910	3367	1502	2910	4837	1502	2910	4891	1231
Grp Volume(v), veh/h	396	658	324	134	639	111	274	1660	0	159	1493	506
Grp Sat Flow(s),veh/h/ln	1455	1612	1567	1455	1683	1502	1455	1612	1502	1455	1524	1550
Q Serve(g_s), s	16.1	21.9	22.2	5.4	22.4	7.6	9.5	35.2	0.0	6.5	33.7	33.7
Cycle Q Clear(g_c), s	16.1	21.9	22.2	5.4	22.4	7.6	9.5	35.2	0.0	6.5	33.7	33.7
Prop In Lane	1.00		0.73	1.00		1.00	1.00		1.00	1.00		0.79
Lane Grp Cap(c), veh/h	425	928	451	180	686	306	231	2117		182	1925	653
V/C Ratio(X)	0.93	0.71	0.72	0.74	0.93	0.36	1.19	0.78		0.87	0.78	0.78
Avail Cap(c_a), veh/h	425	928	451	231	688	307	231	2117		182	1925	653
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.6	38.2	38.3	55.3	46.9	41.1	55.2	28.9	0.0	55.7	29.8	29.8
Incr Delay (d2), s/veh	27.5	2.5	5.4	9.3	19.5	0.7	119.8	3.0	0.0	34.3	3.1	8.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	8.9	9.2	2.2	11.2	2.9	7.3	13.9	0.0	3.3	12.7	13.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.2	40.7	43.8	64.6	66.4	41.8	175.0	31.9	0.0	90.0	33.0	38.6
LnGrp LOS	E	D	D	E	E	D	F	C		F	C	D
Approach Vol, veh/h		1378			884			1934	A		2158	
Approach Delay, s/veh		52.2			63.0			52.1			38.5	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	57.0	11.9	39.0	14.0	55.0	22.0	28.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	52.5	9.5	32.5	9.5	50.5	17.5	24.5
Max Q Clear Time (g_c+I1), s	8.5	37.2	7.4	24.2	11.5	35.7	18.1	24.4
Green Ext Time (p_c), s	0.0	10.3	0.1	4.0	0.0	11.3	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	49.0
HCM 6th LOS	D

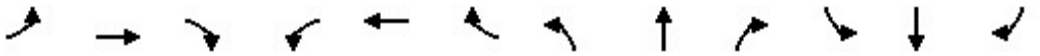
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt						0.850			0.850		0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	6071	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	6071	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				127			200		253	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	4	1801	5	1	1086	15	15	0	9	47	0	12
Future Volume (vph)	4	1801	5	1	1086	15	15	0	9	47	0	12
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	4	1896	5	1	1143	16	16	0	9	49	0	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	1901	0	1	1143	16	16	0	9	49	13	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	4	1801	1	1086	15	15	9	47	0
Future Volume (vph)	4	1801	1	1086	15	15	9	47	0
Turn Type	Prot	NA	Prot	NA	Perm	Prot	Perm	Prot	NA
Protected Phases	7	4	3	8		5		1	6
Permitted Phases					8		2		
Detector Phase	7	4	3	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.5	42.4	9.5	42.4	42.4	11.8	23.7	14.4	26.3
Total Split (%)	10.6%	47.1%	10.6%	47.1%	47.1%	13.1%	26.3%	16.0%	29.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.3	34.6	5.3	34.6	34.6	6.4	5.9	7.6	10.7
Actuated g/C Ratio	0.09	0.60	0.09	0.60	0.60	0.11	0.10	0.13	0.18
v/c Ratio	0.03	0.53	0.01	0.40	0.02	0.09	0.03	0.24	0.02
Control Delay	31.5	8.9	31.0	8.1	0.0	30.6	0.1	30.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.5	8.9	31.0	8.1	0.0	30.6	0.1	30.4	0.1
LOS	C	A	C	A	A	C	A	C	A
Approach Delay		9.0		8.0					24.1
Approach LOS		A		A					C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 58.1	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 47.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street

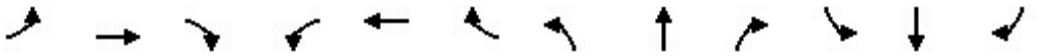
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	4	1901	1	1143	16	16	9	49	13
v/c Ratio	0.03	0.53	0.01	0.40	0.02	0.09	0.03	0.24	0.02
Control Delay	31.5	8.9	31.0	8.1	0.0	30.6	0.1	30.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.5	8.9	31.0	8.1	0.0	30.6	0.1	30.4	0.1
Queue Length 50th (ft)	2	113	0	77	0	6	0	18	0
Queue Length 95th (ft)	11	218	5	158	0	25	0	52	0
Internal Link Dist (ft)		2546		362					358
Turn Bay Length (ft)	130		130		145	165	165	50	
Base Capacity (vph)	144	4214	144	3344	1080	211	657	287	1290
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.45	0.01	0.34	0.01	0.08	0.01	0.17	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1801	5	1	1086	15	15	0	9	47	0	12
Future Volume (veh/h)	4	1801	5	1	1086	15	15	0	9	47	0	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	4	1896	5	1	1143	16	16	0	9	49	0	13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	9	3330	9	3	2528	785	31	163	138	77	203	181
Arrive On Green	0.01	0.53	0.53	0.00	0.52	0.52	0.02	0.00	0.09	0.05	0.00	0.12
Sat Flow, veh/h	1594	6324	17	1594	4837	1502	1594	1772	1502	1594	1683	1502
Grp Volume(v), veh/h	4	1371	530	1	1143	16	16	0	9	49	0	13
Grp Sat Flow(s),veh/h/ln	1594	1524	1769	1594	1612	1502	1594	1772	1502	1594	1683	1502
Q Serve(g_s), s	0.1	11.0	11.0	0.0	8.0	0.3	0.5	0.0	0.3	1.6	0.0	0.4
Cycle Q Clear(g_c), s	0.1	11.0	11.0	0.0	8.0	0.3	0.5	0.0	0.3	1.6	0.0	0.4
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	9	2407	931	3	2528	785	31	163	138	77	203	181
V/C Ratio(X)	0.47	0.57	0.57	0.34	0.45	0.02	0.51	0.00	0.07	0.64	0.00	0.07
Avail Cap(c_a), veh/h	147	3194	1236	147	3379	1049	214	627	531	291	676	603
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.9	8.7	8.7	27.1	8.1	6.3	26.3	0.0	22.5	25.4	0.0	21.2
Incr Delay (d2), s/veh	34.5	0.2	0.6	57.3	0.1	0.0	12.1	0.0	0.2	8.5	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	2.8	3.4	0.1	2.2	0.1	0.3	0.0	0.1	0.8	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.4	8.9	9.2	84.3	8.2	6.3	38.4	0.0	22.7	33.9	0.0	21.3
LnGrp LOS	E	A	A	F	A	A	D	A	C	C	A	C
Approach Vol, veh/h		1905			1160			25			62	
Approach Delay, s/veh		9.1			8.3			32.8			31.3	
Approach LOS		A			A			C			C	

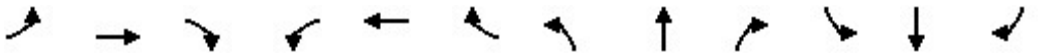
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	9.5	4.6	33.1	5.6	11.0	4.8	32.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.9	19.2	5.0	37.9	7.3	21.8	5.0	37.9
Max Q Clear Time (g_c+I1), s	3.6	2.3	2.0	13.0	2.5	2.4	2.1	10.0
Green Ext Time (p_c), s	0.0	0.0	0.0	15.6	0.0	0.0	0.0	9.7

Intersection Summary	
HCM 6th Ctrl Delay	9.4
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.995				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.953	
Satd. Flow (prot)	2891	6065	0	1583	4794	0	1583	1765	1500	0	1682	1500
Flt Permitted	0.950			0.950			0.727				0.731	
Satd. Flow (perm)	2891	6065	0	1583	4794	0	1212	1765	1500	0	1290	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			10				154			94
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



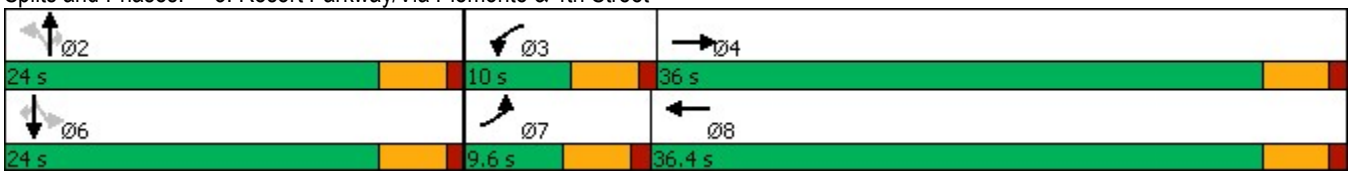
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	29	1818	8	5	1086	38	11	0	20	43	1	20
Future Volume (vph)	29	1818	8	5	1086	38	11	0	20	43	1	20
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	31	1914	8	5	1143	40	12	0	21	45	1	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	1922	0	5	1183	0	12	0	21	0	46	21

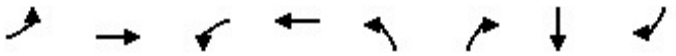
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	29	1818	5	1086	11	20	43	1	20
Future Volume (vph)	29	1818	5	1086	11	20	43	1	20
Turn Type	Prot	NA	Prot	NA	Perm	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8				6	
Permitted Phases					2	2	6		6
Detector Phase	7	4	3	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.6	36.0	10.0	36.4	24.0	24.0	24.0	24.0	24.0
Total Split (%)	13.7%	51.4%	14.3%	52.0%	34.3%	34.3%	34.3%	34.3%	34.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min
Act Effct Green (s)	5.2	30.7	5.6	29.0	7.3	7.3		7.3	7.3
Actuated g/C Ratio	0.11	0.63	0.11	0.59	0.15	0.15		0.15	0.15
v/c Ratio	0.10	0.50	0.03	0.41	0.07	0.06		0.24	0.07
Control Delay	23.9	6.2	23.6	6.8	21.1	0.3		23.8	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	23.9	6.2	23.6	6.8	21.1	0.3		23.8	0.5
LOS	C	A	C	A	C	A		C	A
Approach Delay		6.5		6.9				16.4	
Approach LOS		A		A				B	

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 48.8	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 6.8	Intersection LOS: A
Intersection Capacity Utilization 47.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street





Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBT	SBR
Lane Group Flow (vph)	31	1922	5	1183	12	21	46	21
v/c Ratio	0.10	0.50	0.03	0.41	0.07	0.06	0.24	0.07
Control Delay	23.9	6.2	23.6	6.8	21.1	0.3	23.8	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	6.2	23.6	6.8	21.1	0.3	23.8	0.5
Queue Length 50th (ft)	4	56	1	39	3	0	11	0
Queue Length 95th (ft)	17	163	10	119	16	0	41	0
Internal Link Dist (ft)		362		428			378	
Turn Bay Length (ft)	220		125		115	115		110
Base Capacity (vph)	309	4088	182	3210	495	704	527	669
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.47	0.03	0.37	0.02	0.03	0.09	0.03

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	1818	8	5	1086	38	11	0	20	43	1	20
Future Volume (veh/h)	29	1818	8	5	1086	38	11	0	20	43	1	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	31	1914	8	5	1143	40	12	0	21	45	1	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	105	3563	15	11	2569	90	280	205	174	322	5	174
Arrive On Green	0.04	0.56	0.56	0.01	0.54	0.54	0.12	0.00	0.12	0.12	0.12	0.12
Sat Flow, veh/h	2910	6312	26	1594	4799	168	1312	1772	1502	1355	46	1502
Grp Volume(v), veh/h	31	1386	536	5	768	415	12	0	21	46	0	21
Grp Sat Flow(s),veh/h/ln	1455	1524	1767	1594	1612	1742	1312	1772	1502	1401	0	1502
Q Serve(g_s), s	0.4	8.2	8.2	0.1	6.3	6.3	0.4	0.0	0.5	1.2	0.0	0.5
Cycle Q Clear(g_c), s	0.4	8.2	8.2	0.1	6.3	6.3	1.6	0.0	0.5	1.3	0.0	0.5
Prop In Lane	1.00		0.01	1.00		0.10	1.00		1.00	0.98		1.00
Lane Grp Cap(c), veh/h	105	2581	998	11	1726	932	280	205	174	327	0	174
V/C Ratio(X)	0.30	0.54	0.54	0.47	0.44	0.45	0.04	0.00	0.12	0.14	0.00	0.12
Avail Cap(c_a), veh/h	344	3338	1290	203	2384	1288	721	801	679	797	0	679
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.3	5.9	5.9	21.3	6.1	6.1	18.2	0.0	17.1	17.4	0.0	17.1
Incr Delay (d2), s/veh	1.6	0.2	0.5	28.2	0.2	0.3	0.1	0.0	0.3	0.2	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.6	1.9	0.1	1.4	1.6	0.1	0.0	0.2	0.4	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.8	6.0	6.3	49.6	6.3	6.5	18.2	0.0	17.4	17.6	0.0	17.4
LnGrp LOS	C	A	A	D	A	A	B	A	B	B	A	B
Approach Vol, veh/h		1953			1188			33			67	
Approach Delay, s/veh		6.4			6.5			17.7			17.6	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	4.8	28.9		9.5	6.1	27.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		19.5	5.5	31.5		19.5	5.1	31.9				
Max Q Clear Time (g_c+I1), s		3.6	2.1	10.2		3.3	2.4	8.3				
Green Ext Time (p_c), s		0.0	0.0	14.2		0.2	0.0	8.8				

Intersection Summary	
HCM 6th Ctrl Delay	6.8
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.995					0.865
Flt Protected						
Satd. Flow (prot)	4794	0	0	4818	0	1526
Flt Permitted						
Satd. Flow (perm)	4794	0	0	4818	0	1526
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	1825	63	0	1103	0	27
Future Volume (vph)	1825	63	0	1103	0	27
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1901	66	0	1149	0	28
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1967	0	0	1149	0	28

Intersection Summary

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1825	63	0	1103	0	27
Future Vol, veh/h	1825	63	0	1103	0	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1901	66	0	1149	0	28

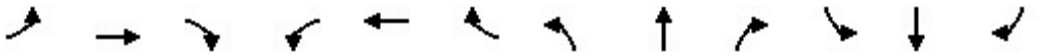
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	984
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	213
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	213
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	24.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	213	-	-	-
HCM Lane V/C Ratio	0.132	-	-	-
HCM Control Delay (s)	24.5	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.4	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.980	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5949	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5949	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			188			285			55		32	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



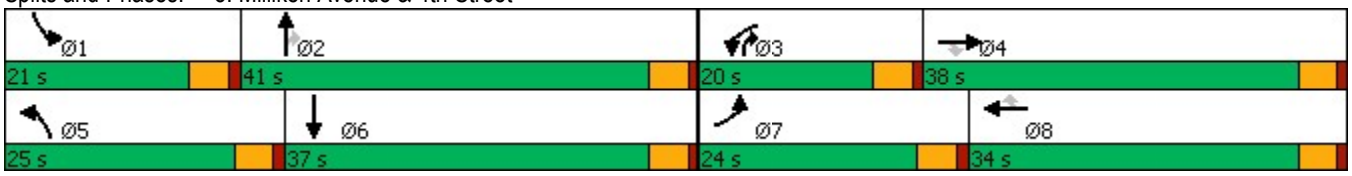
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	436	1072	206	368	846	275	302	1488	365	432	920	144
Future Volume (vph)	436	1072	206	368	846	275	302	1488	365	432	920	144
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	454	1117	215	383	881	286	315	1550	380	450	958	150
Shared Lane Traffic (%)												
Lane Group Flow (vph)	454	1117	215	383	881	286	315	1550	380	450	1108	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	436	1072	206	368	846	275	302	1488	365	432	920
Future Volume (vph)	436	1072	206	368	846	275	302	1488	365	432	920
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	24.0	38.0	38.0	20.0	34.0	34.0	25.0	41.0	20.0	21.0	37.0
Total Split (%)	20.0%	31.7%	31.7%	16.7%	28.3%	28.3%	20.8%	34.2%	16.7%	17.5%	30.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	19.5	32.7	32.7	15.5	28.7	28.7	17.6	36.2	56.2	16.5	35.2
Actuated g/C Ratio	0.16	0.28	0.28	0.13	0.24	0.24	0.15	0.30	0.47	0.14	0.30
v/c Ratio	0.96	0.84	0.39	1.02	0.76	0.50	0.74	0.84	0.51	1.12	0.62
Control Delay	82.2	47.7	9.2	102.1	46.8	7.5	59.2	43.7	21.5	129.3	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.2	47.7	9.2	102.1	46.8	7.5	59.2	43.7	21.5	129.3	37.4
LOS	F	D	A	F	D	A	E	D	C	F	D
Approach Delay		51.8			53.2			42.1			64.0
Approach LOS		D			D			D			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 118.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.12	
Intersection Signal Delay: 51.7	Intersection LOS: D
Intersection Capacity Utilization 86.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 5: Milliken Avenue & 4th Street

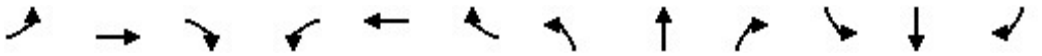


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	454	1117	215	383	881	286	315	1550	380	450	1108
v/c Ratio	0.96	0.84	0.39	1.02	0.76	0.50	0.74	0.84	0.51	1.12	0.62
Control Delay	82.2	47.7	9.2	102.1	46.8	7.5	59.2	43.7	21.5	129.3	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.2	47.7	9.2	102.1	46.8	7.5	59.2	43.7	21.5	129.3	37.4
Queue Length 50th (ft)	182	297	15	~162	231	1	121	325	171	~208	211
Queue Length 95th (ft)	#287	355	78	#262	282	71	168	374	263	#314	257
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	473	1358	557	377	1195	586	498	1863	738	401	1781
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.82	0.39	1.02	0.74	0.49	0.63	0.83	0.51	1.12	0.62

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

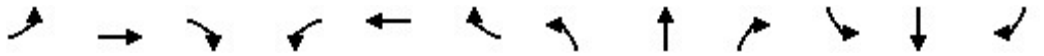
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	436	1072	206	368	846	275	302	1488	365	432	920	144
Future Volume (veh/h)	436	1072	206	368	846	275	302	1488	365	432	920	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	454	1117	215	383	881	286	315	1550	380	450	958	150
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	487	1304	405	387	1138	353	373	1839	653	412	1691	261
Arrive On Green	0.17	0.27	0.27	0.13	0.24	0.24	0.13	0.30	0.30	0.14	0.32	0.32
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	2910	6095	1502	2910	5365	829
Grp Volume(v), veh/h	454	1117	215	383	881	286	315	1550	380	450	814	294
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1455	1524	1502	1455	1524	1623
Q Serve(g_s), s	18.0	25.6	14.2	15.3	19.9	21.0	12.3	27.8	22.3	16.5	17.3	17.6
Cycle Q Clear(g_c), s	18.0	25.6	14.2	15.3	19.9	21.0	12.3	27.8	22.3	16.5	17.3	17.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.51
Lane Grp Cap(c), veh/h	487	1304	405	387	1138	353	373	1839	653	412	1441	511
V/C Ratio(X)	0.93	0.86	0.53	0.99	0.77	0.81	0.85	0.84	0.58	1.09	0.57	0.57
Avail Cap(c_a), veh/h	487	1389	431	387	1224	380	511	1908	669	412	1441	511
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.9	40.5	36.3	50.5	41.7	42.1	49.7	38.1	25.0	50.1	33.3	33.4
Incr Delay (d2), s/veh	25.2	5.3	1.1	43.1	3.0	11.7	9.3	3.5	1.2	71.8	0.5	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	10.7	5.3	7.9	8.2	8.9	5.0	10.7	8.1	10.1	6.4	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.1	45.7	37.4	93.6	44.7	53.8	59.0	41.7	26.2	121.9	33.8	35.0
LnGrp LOS	E	D	D	F	D	D	E	D	C	F	C	C
Approach Vol, veh/h		1786			1550			2245			1558	
Approach Delay, s/veh		51.7			58.4			41.5			59.5	
Approach LOS		D			E			D			E	

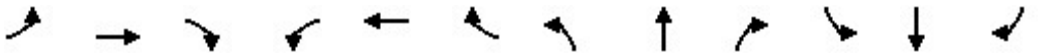
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	39.7	20.0	35.9	19.4	41.3	24.0	31.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	36.5	15.5	33.5	20.5	32.5	19.5	29.5
Max Q Clear Time (g_c+I1), s	18.5	29.8	17.3	27.6	14.3	19.6	20.0	23.0
Green Ext Time (p_c), s	0.0	5.4	0.0	3.9	0.6	6.1	0.0	3.7

Intersection Summary	
HCM 6th Ctrl Delay	51.6
HCM 6th LOS	D



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.927	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2977	1365
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2977	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			130			192			275		188	319
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



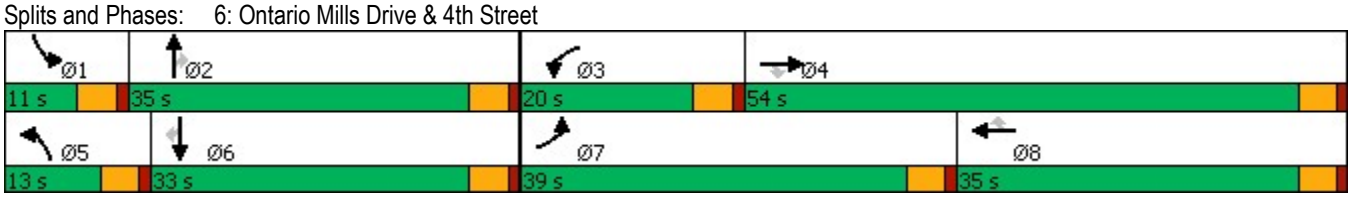
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	956	1213	120	226	965	312	141	310	352	78	312	588
Future Volume (vph)	956	1213	120	226	965	312	141	310	352	78	312	588
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1039	1318	130	246	1049	339	153	337	383	85	339	639
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	1039	1318	130	246	1049	339	153	337	383	85	659	319

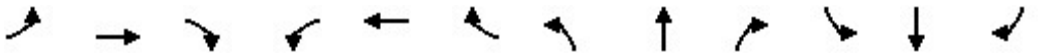
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	956	1213	120	226	965	312	141	310	352	78	312	588
Future Volume (vph)	956	1213	120	226	965	312	141	310	352	78	312	588
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	39.0	54.0	54.0	20.0	35.0	35.0	13.0	35.0	35.0	11.0	33.0	33.0
Total Split (%)	32.5%	45.0%	45.0%	16.7%	29.2%	29.2%	10.8%	29.2%	29.2%	9.2%	27.5%	27.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	34.6	50.6	50.6	14.0	29.9	29.9	8.5	27.4	27.4	6.5	25.4	25.4
Actuated g/C Ratio	0.30	0.43	0.43	0.12	0.26	0.26	0.07	0.24	0.24	0.06	0.22	0.22
v/c Ratio	1.21	0.63	0.18	0.71	0.85	0.64	1.33	0.43	0.68	0.97	0.83	0.58
Control Delay	142.8	28.1	4.3	61.7	49.0	22.8	236.8	39.5	18.2	143.6	40.4	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	142.8	28.1	4.3	61.7	49.0	22.8	236.8	39.5	18.2	143.6	40.4	8.8
LOS	F	C	A	E	D	C	F	D	B	F	D	A
Approach Delay		74.8			45.5			64.8			39.2	
Approach LOS		E			D			E			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 116.5	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.33	
Intersection Signal Delay: 59.2	Intersection LOS: E
Intersection Capacity Utilization 91.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 6: Ontario Mills Drive & 4th Street



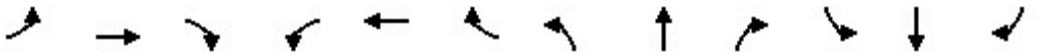


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1039	1318	130	246	1049	339	153	337	383	85	659	319
v/c Ratio	1.21	0.63	0.18	0.71	0.85	0.64	1.33	0.43	0.68	0.97	0.83	0.58
Control Delay	142.8	28.1	4.3	61.7	49.0	22.8	236.8	39.5	18.2	143.6	40.4	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	142.8	28.1	4.3	61.7	49.0	22.8	236.8	39.5	18.2	143.6	40.4	8.8
Queue Length 50th (ft)	~518	297	0	94	284	100	~156	114	69	67	191	0
Queue Length 95th (ft)	#648	350	38	139	342	208	#293	159	182	#174	267	86
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	857	2090	724	385	1263	535	115	879	596	88	871	575
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.21	0.63	0.18	0.64	0.83	0.63	1.33	0.38	0.64	0.97	0.76	0.55

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



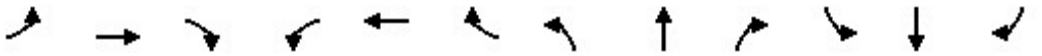
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	956	1213	120	226	965	312	141	310	352	78	312	588
Future Volume (veh/h)	956	1213	120	226	965	312	141	310	352	78	312	588
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	1039	1318	130	246	1049	339	153	337	383	85	339	639
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	841	2115	656	297	1210	376	114	860	384	87	423	717
Arrive On Green	0.29	0.44	0.44	0.10	0.25	0.25	0.07	0.26	0.26	0.05	0.24	0.24
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	1594	3367	1502	1594	1772	3003
Grp Volume(v), veh/h	1039	1318	130	246	1049	339	153	337	383	85	339	639
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1594	1683	1502	1594	1772	1502
Q Serve(g_s), s	34.5	25.2	6.4	9.9	24.8	26.1	8.5	9.9	30.4	6.4	21.5	24.6
Cycle Q Clear(g_c), s	34.5	25.2	6.4	9.9	24.8	26.1	8.5	9.9	30.4	6.4	21.5	24.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	841	2115	656	297	1210	376	114	860	384	87	423	717
V/C Ratio(X)	1.24	0.62	0.20	0.83	0.87	0.90	1.35	0.39	1.00	0.98	0.80	0.89
Avail Cap(c_a), veh/h	841	2115	656	378	1236	384	114	860	384	87	423	717
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.4	26.0	20.7	52.6	42.9	43.3	55.4	36.7	44.4	56.4	42.8	43.9
Incr Delay (d2), s/veh	116.0	0.6	0.1	11.5	6.7	23.6	203.7	0.3	45.4	89.5	10.6	13.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	25.8	9.6	2.3	4.1	10.6	12.1	9.8	4.1	16.0	4.7	10.6	10.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	158.5	26.6	20.8	64.1	49.5	67.0	259.2	37.0	89.8	145.8	53.3	57.3
LnGrp LOS	F	C	C	E	D	E	F	D	F	F	D	E
Approach Vol, veh/h		2487			1634			873			1063	
Approach Delay, s/veh		81.4			55.3			99.1			63.1	
Approach LOS		F			E			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	35.0	16.7	56.7	13.0	33.0	39.0	34.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	30.5	15.5	49.5	8.5	28.5	34.5	30.5
Max Q Clear Time (g_c+I1), s	8.4	32.4	11.9	27.2	10.5	26.6	36.5	28.1
Green Ext Time (p_c), s	0.0	0.0	0.3	10.9	0.0	1.0	0.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay	73.7
HCM 6th LOS	E

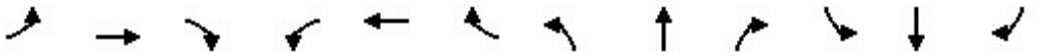
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.972			0.936				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.982	
Satd. Flow (prot)	2891	4818	1500	1583	4683	0	1583	3138	0	1504	1646	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.982	
Satd. Flow (perm)	2891	4818	1500	1583	4683	0	1583	3138	0	1504	1646	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			101		41			60				297
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



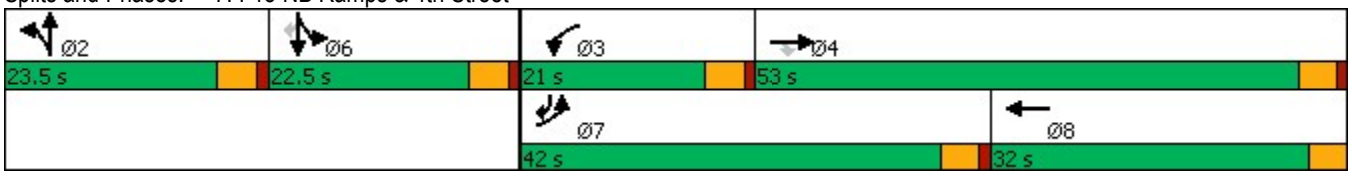
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	831	705	97	79	746	171	119	77	58	144	68	625
Future Volume (vph)	831	705	97	79	746	171	119	77	58	144	68	625
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	866	734	101	82	777	178	124	80	60	150	71	651
Shared Lane Traffic (%)										27%		
Lane Group Flow (vph)	866	734	101	82	955	0	124	140	0	109	112	651

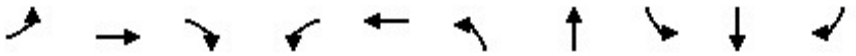
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	831	705	97	79	746	119	77	144	68	625
Future Volume (vph)	831	705	97	79	746	119	77	144	68	625
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	42.0	53.0	53.0	21.0	32.0	23.5	23.5	22.5	22.5	42.0
Total Split (%)	35.0%	44.2%	44.2%	17.5%	26.7%	19.6%	19.6%	18.8%	18.8%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	36.2	53.5	53.5	11.0	26.4	13.5	13.5	12.8	12.8	53.6
Actuated g/C Ratio	0.34	0.50	0.50	0.10	0.25	0.13	0.13	0.12	0.12	0.50
v/c Ratio	0.88	0.30	0.13	0.50	0.80	0.62	0.31	0.60	0.57	0.44
Control Delay	46.0	18.4	4.6	58.4	42.7	59.5	27.6	60.5	57.5	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.0	18.4	4.6	58.4	42.7	59.5	27.6	60.5	57.5	9.9
LOS	D	B	A	E	D	E	C	E	E	A
Approach Delay		31.6			43.9		42.6		22.4	
Approach LOS		C			D		D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 106.3	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 33.6	Intersection LOS: C
Intersection Capacity Utilization 75.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street

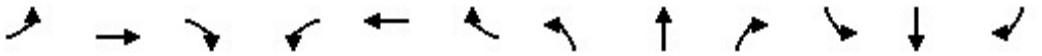




Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	866	734	101	82	955	124	140	109	112	651
v/c Ratio	0.88	0.30	0.13	0.50	0.80	0.62	0.31	0.60	0.57	0.44
Control Delay	46.0	18.4	4.6	58.4	42.7	59.5	27.6	60.5	57.5	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.0	18.4	4.6	58.4	42.7	59.5	27.6	60.5	57.5	9.9
Queue Length 50th (ft)	294	110	0	56	220	84	26	77	80	81
Queue Length 95th (ft)	#470	179	34	111	304	153	59	146	147	140
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	1036	2423	804	249	1305	287	619	258	283	1520
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.30	0.13	0.33	0.73	0.43	0.23	0.42	0.40	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	831	705	97	79	746	171	119	77	58	144	68	625
Future Volume (veh/h)	831	705	97	79	746	171	119	77	58	144	68	625
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	866	734	101	82	777	178	124	80	60	110	126	651
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	939	2408	748	102	943	214	162	194	133	264	293	1466
Arrive On Green	0.32	0.50	0.50	0.06	0.24	0.24	0.10	0.10	0.10	0.17	0.17	0.17
Sat Flow, veh/h	2910	4837	1502	1594	3941	895	1594	1910	1309	1594	1772	3003
Grp Volume(v), veh/h	866	734	101	82	635	320	124	70	70	110	126	651
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1594	1612	1611	1594	1683	1536	1594	1772	1502
Q Serve(g_s), s	30.2	9.5	3.8	5.3	19.6	19.9	8.0	4.1	4.5	6.5	6.7	14.9
Cycle Q Clear(g_c), s	30.2	9.5	3.8	5.3	19.6	19.9	8.0	4.1	4.5	6.5	6.7	14.9
Prop In Lane	1.00		1.00	1.00		0.56	1.00		0.85	1.00		1.00
Lane Grp Cap(c), veh/h	939	2408	748	102	772	386	162	171	156	264	293	1466
V/C Ratio(X)	0.92	0.30	0.14	0.80	0.82	0.83	0.76	0.41	0.45	0.42	0.43	0.44
Avail Cap(c_a), veh/h	1035	2408	748	250	872	436	287	303	277	272	303	1482
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.4	15.7	14.2	48.6	38.0	38.1	46.1	44.4	44.6	39.4	39.5	17.6
Incr Delay (d2), s/veh	12.4	0.1	0.1	13.3	5.8	11.7	7.3	1.5	2.0	1.1	1.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.1	3.4	1.3	2.5	8.3	9.0	3.5	1.8	1.8	2.6	3.0	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.9	15.7	14.3	61.9	43.7	49.7	53.4	45.9	46.6	40.5	40.5	17.8
LnGrp LOS	D	B	B	E	D	D	D	D	D	D	D	B
Approach Vol, veh/h		1701			1037			264			887	
Approach Delay, s/veh		31.5			47.0			49.6			23.9	
Approach LOS		C			D			D			C	

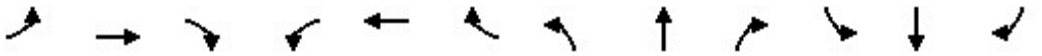
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		15.2	11.3	57.0		21.9	38.5	29.7				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		19.0	16.5	48.5		18.0	37.5	* 29				
Max Q Clear Time (g_c+I1), s		10.0	7.3	11.5		16.9	32.2	21.9				
Green Ext Time (p_c), s		0.7	0.1	6.4		0.5	1.8	3.3				

Intersection Summary	
HCM 6th Ctrl Delay	35.1
HCM 6th LOS	D

Notes

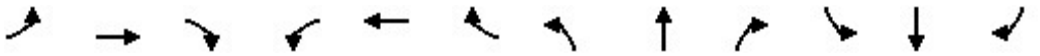
User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.907				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3041	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3041	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		66				149			149			149
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



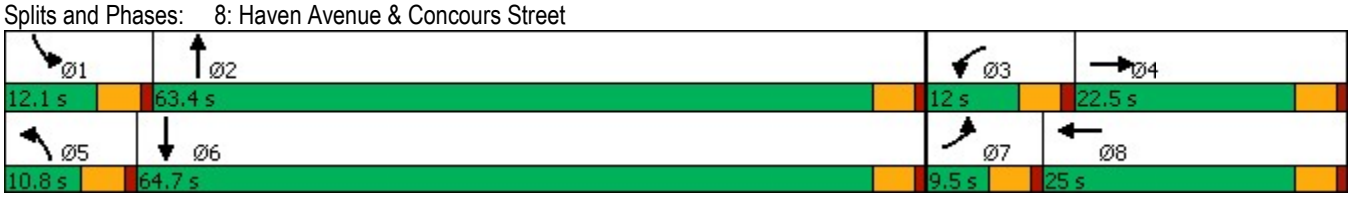
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	26	40	65	178	95	97	48	2351	183	44	1907	28
Future Volume (vph)	26	40	65	178	95	97	48	2351	183	44	1907	28
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	27	41	66	182	97	99	49	2399	187	45	1946	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	107	0	182	97	99	49	2399	187	45	1946	29

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	26	40	178	95	97	48	2351	183	44	1907	28
Future Volume (vph)	26	40	178	95	97	48	2351	183	44	1907	28
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	12.0	25.0		10.8	63.4		12.1	64.7	
Total Split (%)	8.6%	20.5%	10.9%	22.7%		9.8%	57.6%		11.0%	58.8%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.1	7.0	7.5	13.8	92.3	6.2	57.5	92.3	6.8	55.8	92.3
Actuated g/C Ratio	0.06	0.08	0.08	0.15	1.00	0.07	0.62	1.00	0.07	0.60	1.00
v/c Ratio	0.17	0.37	0.57	0.19	0.07	0.25	0.63	0.12	0.21	0.53	0.02
Control Delay	47.9	23.6	50.3	40.2	0.1	47.5	12.7	0.2	45.6	11.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	23.6	50.3	40.2	0.1	47.5	12.7	0.2	45.6	11.7	0.0
LOS	D	C	D	D	A	D	B	A	D	B	A
Approach Delay		28.5		34.5			12.4			12.3	
Approach LOS		C		C			B			B	

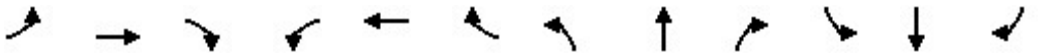
Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 92.3	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 14.4	Intersection LOS: B
Intersection Capacity Utilization 54.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	27	107	182	97	99	49	2399	187	45	1946	29
v/c Ratio	0.17	0.37	0.57	0.19	0.07	0.25	0.63	0.12	0.21	0.53	0.02
Control Delay	47.9	23.6	50.3	40.2	0.1	47.5	12.7	0.2	45.6	11.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	23.6	50.3	40.2	0.1	47.5	12.7	0.2	45.6	11.7	0.0
Queue Length 50th (ft)	8	13	39	30	0	15	266	0	13	188	0
Queue Length 95th (ft)	23	39	65	56	0	35	332	0	32	234	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	158	653	324	753	1500	199	3920	1500	240	4007	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.16	0.56	0.13	0.07	0.25	0.61	0.12	0.19	0.49	0.02

Intersection Summary



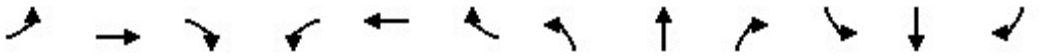
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	40	65	178	95	97	48	2351	183	44	1907	28
Future Volume (veh/h)	26	40	65	178	95	97	48	2351	183	44	1907	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	27	41	66	182	97	0	49	2399	0	45	1946	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	81	119	106	273	377		118	3694		113	3683	
Arrive On Green	0.03	0.07	0.07	0.07	0.11	0.00	0.04	0.61	0.00	0.04	0.60	0.00
Sat Flow, veh/h	2910	1683	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	27	41	66	182	97	0	49	2399	0	45	1946	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	0.8	1.9	3.6	3.7	2.2	0.0	1.4	21.4	0.0	1.3	15.5	0.0
Cycle Q Clear(g_c), s	0.8	1.9	3.6	3.7	2.2	0.0	1.4	21.4	0.0	1.3	15.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	81	119	106	273	377		118	3694		113	3683	
V/C Ratio(X)	0.33	0.34	0.62	0.67	0.26		0.41	0.65		0.40	0.53	
Avail Cap(c_a), veh/h	174	363	323	356	826		219	4296		265	4391	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	39.9	37.0	37.7	38.0	33.9	0.0	39.1	10.7	0.0	39.2	9.6	0.0
Incr Delay (d2), s/veh	2.4	1.7	5.8	3.0	0.4	0.0	2.3	0.3	0.0	2.3	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.8	1.5	1.3	0.9	0.0	0.5	6.3	0.0	0.5	4.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.2	38.7	43.5	41.0	34.3	0.0	41.4	11.0	0.0	41.5	9.7	0.0
LnGrp LOS	D	D	D	D	C		D	B		D	A	
Approach Vol, veh/h		134			279	A		2448	A		1991	A
Approach Delay, s/veh		41.8			38.6			11.6			10.4	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	55.1	10.3	10.4	7.9	55.0	6.8	13.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.6	58.9	7.5	18.0	6.3	60.2	5.0	20.5
Max Q Clear Time (g_c+I1), s	3.3	23.4	5.7	5.6	3.4	17.5	2.8	4.2
Green Ext Time (p_c), s	0.0	27.3	0.1	0.4	0.0	23.8	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	13.5
HCM 6th LOS	B

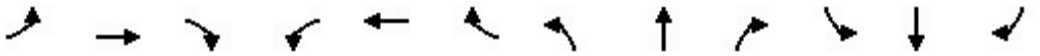
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.935			0.951						0.998	
Flt Protected	0.950	0.972			0.969		0.950			0.950		
Satd. Flow (prot)	1593	1524	0	0	1626	0	1676	4818	0	1676	4808	0
Flt Permitted	0.950	0.972					0.950			0.950		
Satd. Flow (perm)	1593	1524	0	0	1678	0	1676	4818	0	1676	4808	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		95			95						2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



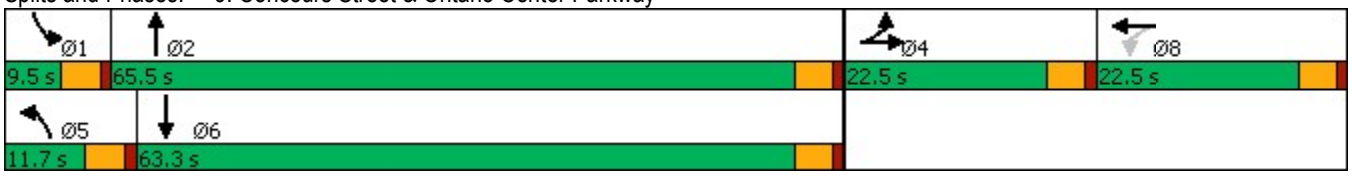
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	47	0	12	15	0	9	4	1801	5	1	1086	15
Future Volume (vph)	47	0	12	15	0	9	4	1801	5	1	1086	15
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	49	0	13	16	0	9	4	1896	5	1	1143	16
Shared Lane Traffic (%)	35%											
Lane Group Flow (vph)	32	30	0	0	25	0	4	1901	0	1	1159	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	47	0	15	0	4	1801	1	1086
Future Volume (vph)	47	0	15	0	4	1801	1	1086
Turn Type	Split	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	4	4		8	5	2	1	6
Permitted Phases			8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	11.7	65.5	9.5	63.3
Total Split (%)	18.8%	18.8%	18.8%	18.8%	9.8%	54.6%	7.9%	52.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	7.6	7.6		6.0	6.2	56.9	5.4	56.7
Actuated g/C Ratio	0.10	0.10		0.08	0.08	0.77	0.07	0.77
v/c Ratio	0.20	0.12		0.11	0.03	0.51	0.01	0.31
Control Delay	40.2	1.1		1.0	40.5	6.6	42.0	5.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	1.1		1.0	40.5	6.6	42.0	5.3
LOS	D	A		A	D	A	D	A
Approach Delay		21.2		1.0		6.7		5.3
Approach LOS		C		A		A		A

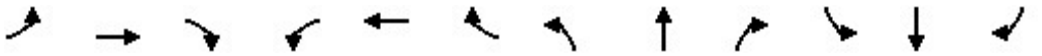
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 73.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 6.4	Intersection LOS: A
Intersection Capacity Utilization 52.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	32	30	25	4	1901	1	1159
v/c Ratio	0.20	0.12	0.11	0.03	0.51	0.01	0.31
Control Delay	40.2	1.1	1.0	40.5	6.6	42.0	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	1.1	1.0	40.5	6.6	42.0	5.3
Queue Length 50th (ft)	15	0	0	2	82	1	39
Queue Length 95th (ft)	50	0	0	13	305	6	160
Internal Link Dist (ft)		319	68		111		176
Turn Bay Length (ft)	170			115		120	
Base Capacity (vph)	420	472	513	177	3924	123	3844
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.06	0.05	0.02	0.48	0.01	0.30

Intersection Summary



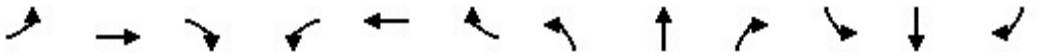
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	0	12	15	0	9	4	1801	5	1	1086	15
Future Volume (veh/h)	47	0	12	15	0	9	4	1801	5	1	1086	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	31	25	13	16	0	9	4	1896	5	1	1143	16
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	95	62	32	29	0	16	9	3103	8	3	3042	43
Arrive On Green	0.06	0.06	0.06	0.03	0.00	0.03	0.01	0.62	0.62	0.00	0.62	0.62
Sat Flow, veh/h	1688	1098	571	1034	0	582	1688	4981	13	1688	4916	69
Grp Volume(v), veh/h	31	0	38	25	0	0	4	1227	674	1	750	409
Grp Sat Flow(s),veh/h/ln	1688	0	1669	1616	0	0	1688	1612	1770	1688	1612	1760
Q Serve(g_s), s	1.1	0.0	1.4	0.9	0.0	0.0	0.1	14.3	14.3	0.0	7.1	7.1
Cycle Q Clear(g_c), s	1.1	0.0	1.4	0.9	0.0	0.0	0.1	14.3	14.3	0.0	7.1	7.1
Prop In Lane	1.00		0.34	0.64		0.36	1.00		0.01	1.00		0.04
Lane Grp Cap(c), veh/h	95	0	94	46	0	0	9	2009	1102	3	1996	1089
V/C Ratio(X)	0.33	0.00	0.41	0.55	0.00	0.00	0.44	0.61	0.61	0.37	0.38	0.38
Avail Cap(c_a), veh/h	492	0	486	471	0	0	197	3184	1747	137	3070	1675
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.0	0.0	28.2	29.6	0.0	0.0	30.6	7.1	7.1	30.8	5.8	5.8
Incr Delay (d2), s/veh	2.0	0.0	2.8	9.9	0.0	0.0	30.3	0.3	0.6	66.6	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.6	0.5	0.0	0.0	0.1	3.6	4.1	0.1	1.8	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.0	0.0	31.0	39.5	0.0	0.0	60.9	7.4	7.6	97.5	6.0	6.1
LnGrp LOS	C	A	C	D	A	A	E	A	A	F	A	A
Approach Vol, veh/h		69			25			1905			1160	
Approach Delay, s/veh		30.5			39.5			7.6			6.1	
Approach LOS		C			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	43.0		8.0	4.8	42.7		6.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	61.0		18.0	7.2	58.8		18.0				
Max Q Clear Time (g_c+I1), s	2.0	16.3		3.4	2.1	9.1		2.9				
Green Ext Time (p_c), s	0.0	22.2		0.2	0.0	10.4		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	7.8
HCM 6th LOS	A

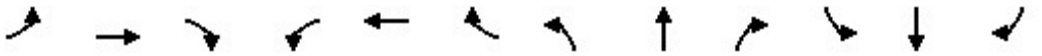
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			193			193			193			193
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



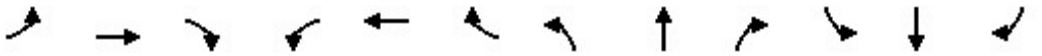
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	339	133	144	173	69	117	186	1664	130	184	1239	129
Future Volume (vph)	339	133	144	173	69	117	186	1664	130	184	1239	129
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	353	139	150	180	72	122	194	1733	135	192	1291	134
Shared Lane Traffic (%)												
Lane Group Flow (vph)	353	139	150	180	72	122	194	1733	135	192	1291	134

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	339	133	144	173	69	117	186	1664	130	184	1239	129
Future Volume (vph)	339	133	144	173	69	117	186	1664	130	184	1239	129
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	24.1	26.7		19.9	22.5		19.8	48.4		15.0	43.6	
Total Split (%)	21.9%	24.3%		18.1%	20.5%		18.0%	44.0%		13.6%	39.6%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	18.2	11.8	91.5	11.2	7.5	91.5	11.6	40.1	91.5	10.0	38.5	91.5
Actuated g/C Ratio	0.20	0.13	1.00	0.12	0.08	1.00	0.13	0.44	1.00	0.11	0.42	1.00
v/c Ratio	0.61	0.32	0.10	0.51	0.26	0.08	0.53	0.65	0.09	0.61	0.50	0.09
Control Delay	40.8	39.9	0.1	44.5	44.8	0.1	44.5	22.0	0.1	49.9	21.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	39.9	0.1	44.5	44.8	0.1	44.5	22.0	0.1	49.9	21.1	0.1
LOS	D	D	A	D	D	A	D	C	A	D	C	A
Approach Delay		31.1			30.1			22.7			22.8	
Approach LOS		C			C			C			C	

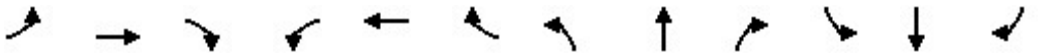
Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 91.5	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 24.4	Intersection LOS: C
Intersection Capacity Utilization 62.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Milliken Avenue & Concours Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	353	139	150	180	72	122	194	1733	135	192	1291	134
v/c Ratio	0.61	0.32	0.10	0.51	0.26	0.08	0.53	0.65	0.09	0.61	0.50	0.09
Control Delay	40.8	39.9	0.1	44.5	44.8	0.1	44.5	22.0	0.1	49.9	21.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	39.9	0.1	44.5	44.8	0.1	44.5	22.0	0.1	49.9	21.1	0.1
Queue Length 50th (ft)	106	41	0	54	22	0	58	229	0	59	159	0
Queue Length 95th (ft)	157	73	0	89	45	0	95	293	0	100	222	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	630	828	1500	495	671	1500	492	2966	1500	337	2710	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.17	0.10	0.36	0.11	0.08	0.39	0.58	0.09	0.57	0.48	0.09

Intersection Summary



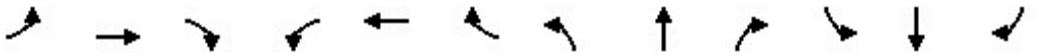
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	339	133	144	173	69	117	186	1664	130	184	1239	129
Future Volume (veh/h)	339	133	144	173	69	117	186	1664	130	184	1239	129
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	353	139	0	180	72	0	194	1733	0	192	1291	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	450	443		260	224		276	2730		267	2712	
Arrive On Green	0.15	0.13	0.00	0.09	0.07	0.00	0.09	0.45	0.00	0.09	0.44	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	353	139	0	180	72	0	194	1733	0	192	1291	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	8.8	2.8	0.0	4.5	1.5	0.0	4.9	16.5	0.0	4.8	11.2	0.0
Cycle Q Clear(g_c), s	8.8	2.8	0.0	4.5	1.5	0.0	4.9	16.5	0.0	4.8	11.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	450	443		260	224		276	2730		267	2712	
V/C Ratio(X)	0.78	0.31		0.69	0.32		0.70	0.63		0.72	0.48	
Avail Cap(c_a), veh/h	758	994		596	806		592	3558		406	3169	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.6	29.6	0.0	33.2	33.5	0.0	33.0	16.0	0.0	33.2	14.7	0.0
Incr Delay (d2), s/veh	3.1	0.4	0.0	3.3	0.8	0.0	3.3	0.2	0.0	3.6	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	1.1	0.0	1.7	0.6	0.0	1.8	5.3	0.0	1.8	3.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.6	30.0	0.0	36.5	34.3	0.0	36.3	16.3	0.0	36.8	14.8	0.0
LnGrp LOS	C	C		D	C		D	B		D	B	
Approach Vol, veh/h		492	A		252	A		1927	A		1483	A
Approach Delay, s/veh		32.6			35.9			18.3			17.7	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.4	38.2	11.2	14.4	11.6	38.0	16.1	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	43.9	15.4	22.2	15.3	39.1	19.6	18.0
Max Q Clear Time (g_c+I1), s	6.8	18.5	6.5	4.8	6.9	13.2	10.8	3.5
Green Ext Time (p_c), s	0.2	15.2	0.4	0.7	0.4	10.8	0.9	0.2

Intersection Summary	
HCM 6th Ctrl Delay	20.8
HCM 6th LOS	C

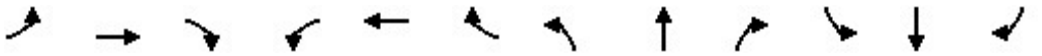
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55			177			242			177
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



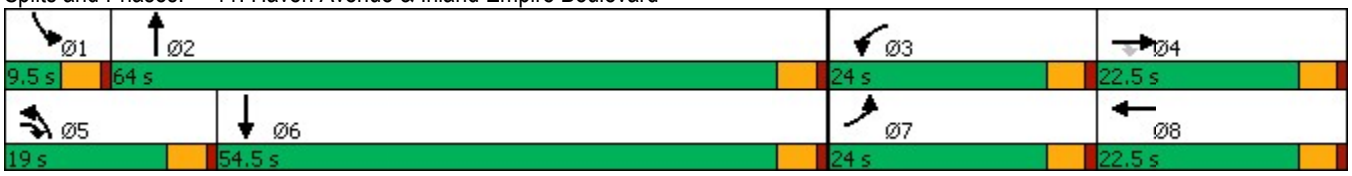
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	170	218	483	638	157	41	352	1895	435	42	2215	46
Future Volume (vph)	170	218	483	638	157	41	352	1895	435	42	2215	46
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	183	234	519	686	169	44	378	2038	468	45	2382	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	183	234	519	686	169	44	378	2038	468	45	2382	49

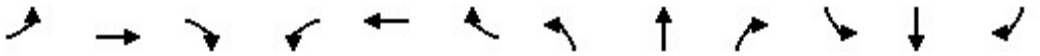
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	218	483	638	157	41	352	1895	435	42	2215	46
Future Volume (vph)	170	218	483	638	157	41	352	1895	435	42	2215	46
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	24.0	22.5	19.0	24.0	22.5		19.0	64.0		9.5	54.5	
Total Split (%)	20.0%	18.8%	15.8%	20.0%	18.8%		15.8%	53.3%		7.9%	45.4%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	12.6	13.3	32.3	19.5	20.2	115.4	14.5	61.5	115.4	5.0	50.0	115.4
Actuated g/C Ratio	0.11	0.12	0.28	0.17	0.18	1.00	0.13	0.53	1.00	0.04	0.43	1.00
v/c Ratio	0.58	0.61	1.13	1.03	0.29	0.03	1.04	0.63	0.31	0.36	0.91	0.03
Control Delay	56.4	55.4	117.4	90.1	43.4	0.0	107.7	20.8	0.5	62.9	36.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.4	55.4	117.4	90.1	43.4	0.0	107.7	20.8	0.5	62.9	36.8	0.0
LOS	E	E	F	F	D	A	F	C	A	E	D	A
Approach Delay		89.9			76.9			28.9			36.5	
Approach LOS		F			E			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 115.4	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 45.4	Intersection LOS: D
Intersection Capacity Utilization 92.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard



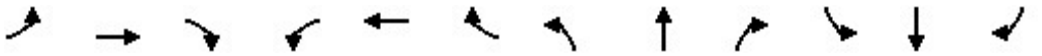


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	183	234	519	686	169	44	378	2038	468	45	2382	49
v/c Ratio	0.58	0.61	1.13	1.03	0.29	0.03	1.04	0.63	0.31	0.36	0.91	0.03
Control Delay	56.4	55.4	117.4	90.1	43.4	0.0	107.7	20.8	0.5	62.9	36.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.4	55.4	117.4	90.1	43.4	0.0	107.7	20.8	0.5	62.9	36.8	0.0
Queue Length 50th (ft)	67	88	~417	~193	57	0	~156	308	0	17	469	0
Queue Length 95th (ft)	105	130	#623	#289	94	0	#267	375	0	38	559	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	488	523	459	666	587	1500	363	3236	1500	125	2632	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.45	1.13	1.03	0.29	0.03	1.04	0.63	0.31	0.36	0.91	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



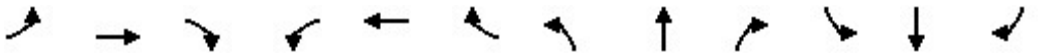
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	218	483	638	157	41	352	1895	435	42	2215	46
Future Volume (veh/h)	170	218	483	638	157	41	352	1895	435	42	2215	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	183	234	519	686	169	0	378	2038	0	45	2382	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	237	506	407	645	779		352	3075		94	2535	
Arrive On Green	0.08	0.15	0.15	0.16	0.23	0.00	0.12	0.50	0.00	0.03	0.42	0.00
Sat Flow, veh/h	2910	3367	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	183	234	519	686	169	0	378	2038	0	45	2382	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	7.4	7.6	18.0	19.5	4.9	0.0	14.5	29.8	0.0	1.8	44.9	0.0
Cycle Q Clear(g_c), s	7.4	7.6	18.0	19.5	4.9	0.0	14.5	29.8	0.0	1.8	44.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	237	506	407	645	779		352	3075		94	2535	
V/C Ratio(X)	0.77	0.46	1.27	1.06	0.22		1.07	0.66		0.48	0.94	
Avail Cap(c_a), veh/h	474	506	407	645	779		352	3075		121	2543	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	53.9	46.5	43.7	50.2	37.3	0.0	52.7	22.1	0.0	57.0	33.6	0.0
Incr Delay (d2), s/veh	5.3	0.7	141.4	53.4	0.1	0.0	68.9	0.5	0.0	3.7	7.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	3.2	27.9	9.6	2.0	0.0	8.7	10.5	0.0	0.7	17.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.2	47.2	185.1	103.5	37.4	0.0	121.6	22.6	0.0	60.7	41.3	0.0
LnGrp LOS	E	D	F	F	D		F	C		E	D	
Approach Vol, veh/h		936			855	A		2416	A		2427	A
Approach Delay, s/veh		126.0			90.5			38.1			41.7	
Approach LOS		F			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	65.0	24.0	22.5	19.0	54.3	14.3	32.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	59.5	19.5	18.0	14.5	50.0	19.5	18.0
Max Q Clear Time (g_c+I1), s	3.8	31.8	21.5	20.0	16.5	46.9	9.4	6.9
Green Ext Time (p_c), s	0.0	19.2	0.0	0.0	0.0	2.9	0.4	0.7

Intersection Summary	
HCM 6th Ctrl Delay	58.6
HCM 6th LOS	E

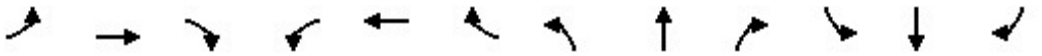
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			340			177			177			177
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



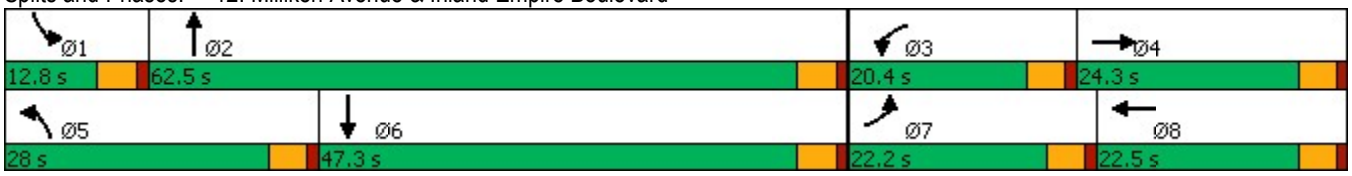
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	294	287	323	212	78	86	391	1590	365	97	1405	119
Future Volume (vph)	294	287	323	212	78	86	391	1590	365	97	1405	119
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	309	302	340	223	82	91	412	1674	384	102	1479	125
Shared Lane Traffic (%)												
Lane Group Flow (vph)	309	302	340	223	82	91	412	1674	384	102	1479	125

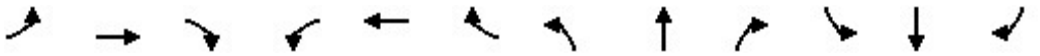
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	294	287	323	212	78	86	391	1590	365	97	1405	119
Future Volume (vph)	294	287	323	212	78	86	391	1590	365	97	1405	119
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	22.2	24.3		20.4	22.5		28.0	62.5		12.8	47.3	
Total Split (%)	18.5%	20.3%		17.0%	18.8%		23.3%	52.1%		10.7%	39.4%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	18.8	14.9	103.3	13.1	12.0	103.3	19.5	48.9	103.3	7.9	37.3	103.3
Actuated g/C Ratio	0.18	0.14	1.00	0.13	0.12	1.00	0.19	0.47	1.00	0.08	0.36	1.00
v/c Ratio	0.59	0.63	0.23	0.61	0.21	0.06	0.76	0.58	0.26	0.46	0.68	0.08
Control Delay	48.0	49.6	0.3	52.7	45.3	0.1	50.9	20.9	0.4	57.3	30.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	49.6	0.3	52.7	45.3	0.1	50.9	20.9	0.4	57.3	30.4	0.1
LOS	D	D	A	D	D	A	D	C	A	E	C	A
Approach Delay		31.5			39.1			22.7			29.8	
Approach LOS		C			D			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 103.3	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 27.6	Intersection LOS: C
Intersection Capacity Utilization 65.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	309	302	340	223	82	91	412	1674	384	102	1479	125
v/c Ratio	0.59	0.63	0.23	0.61	0.21	0.06	0.76	0.58	0.26	0.46	0.68	0.08
Control Delay	48.0	49.6	0.3	52.7	45.3	0.1	50.9	20.9	0.4	57.3	30.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	49.6	0.3	52.7	45.3	0.1	50.9	20.9	0.4	57.3	30.4	0.1
Queue Length 50th (ft)	106	106	0	77	27	0	141	231	0	36	245	0
Queue Length 95th (ft)	169	162	0	127	54	0	213	298	0	70	323	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	551	661	1500	457	600	1500	676	3507	1500	238	2588	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.46	0.23	0.49	0.14	0.06	0.61	0.48	0.26	0.43	0.57	0.08

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	294	287	323	212	78	86	391	1590	365	97	1405	119
Future Volume (veh/h)	294	287	323	212	78	86	391	1590	365	97	1405	119
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	309	302	0	223	82	0	412	1674	0	102	1479	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	393	428		301	322		507	3016		160	2289	
Arrive On Green	0.13	0.13	0.00	0.10	0.10	0.00	0.17	0.49	0.00	0.06	0.38	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	309	302	0	223	82	0	412	1674	0	102	1479	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	8.4	7.0	0.0	6.1	1.9	0.0	11.2	15.7	0.0	2.8	16.4	0.0
Cycle Q Clear(g_c), s	8.4	7.0	0.0	6.1	1.9	0.0	11.2	15.7	0.0	2.8	16.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	393	428		301	322		507	3016		160	2289	
V/C Ratio(X)	0.79	0.71		0.74	0.25		0.81	0.56		0.64	0.65	
Avail Cap(c_a), veh/h	629	813		565	740		835	4314		295	3184	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.3	34.3	0.0	35.7	34.3	0.0	32.5	14.4	0.0	37.9	21.1	0.0
Incr Delay (d2), s/veh	3.5	2.2	0.0	3.6	0.4	0.0	3.2	0.2	0.0	4.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	2.9	0.0	2.3	0.8	0.0	4.0	5.0	0.0	1.1	5.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.8	36.5	0.0	39.2	34.8	0.0	35.7	14.6	0.0	42.1	21.4	0.0
LnGrp LOS	D	D		D	C		D	B		D	C	
Approach Vol, veh/h		611	A		305	A		2086	A		1581	A
Approach Delay, s/veh		37.2			38.0			18.8			22.7	
Approach LOS		D			D			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	45.0	13.0	14.9	18.8	35.3	15.6	12.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.3	58.0	15.9	19.8	23.5	42.8	17.7	18.0
Max Q Clear Time (g_c+I1), s	4.8	17.7	8.1	9.0	13.2	18.4	10.4	3.9
Green Ext Time (p_c), s	0.1	18.6	0.4	1.4	1.1	12.4	0.6	0.3

Intersection Summary	
HCM 6th Ctrl Delay	23.9
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.984	0.850				
Flt Protected	0.957					
Satd. Flow (prot)	3045	1365	6071	0	0	6071
Flt Permitted	0.957					
Satd. Flow (perm)	3045	1365	6071	0	0	6071
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	3	3				
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	498	314	2234	0	0	2266
Future Volume (vph)	498	314	2234	0	0	2266
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	519	327	2327	0	0	2360
Shared Lane Traffic (%)		19%				
Lane Group Flow (vph)	581	265	2327	0	0	2360

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	498	314	2234	2266
Future Volume (vph)	498	314	2234	2266
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	41.0	41.0
Total Split (%)	36.9%	36.9%	63.1%	63.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	16.5	16.5	36.6	36.6
Actuated g/C Ratio	0.27	0.27	0.59	0.59
v/c Ratio	0.72	0.73	0.65	0.66
Control Delay	26.0	33.1	10.0	10.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	26.0	33.1	10.0	10.2
LOS	C	C	B	B
Approach Delay	28.2		10.0	10.2
Approach LOS	C		B	B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 62.1	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 12.9	Intersection LOS: B
Intersection Capacity Utilization 64.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	581	265	2327	2360
v/c Ratio	0.72	0.73	0.65	0.66
Control Delay	26.0	33.1	10.0	10.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	26.0	33.1	10.0	10.2
Queue Length 50th (ft)	101	97	159	164
Queue Length 95th (ft)	149	#184	210	215
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	960	431	3575	3575
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.61	0.61	0.65	0.66

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

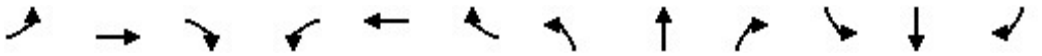
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	498	314	2234	0	0	2266
Future Volume (veh/h)	498	314	2234	0	0	2266
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1673	1772	1772	0	0	1772
Adj Flow Rate, veh/h	561	282	2327	0	0	2360
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	789	371	3611	0	0	3611
Arrive On Green	0.25	0.25	0.59	0.00	0.00	0.59
Sat Flow, veh/h	3188	1502	6592	0	0	6592
Grp Volume(v), veh/h	561	282	2327	0	0	2360
Grp Sat Flow(s),veh/h/ln	1594	1502	1524	0	0	1524
Q Serve(g_s), s	9.0	9.8	14.1	0.0	0.0	14.5
Cycle Q Clear(g_c), s	9.0	9.8	14.1	0.0	0.0	14.5
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	789	371	3611	0	0	3611
V/C Ratio(X)	0.71	0.76	0.64	0.00	0.00	0.65
Avail Cap(c_a), veh/h	1107	521	3961	0	0	3961
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	19.3	19.6	7.5	0.0	0.0	7.6
Incr Delay (d2), s/veh	1.3	4.1	0.3	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	3.5	3.3	0.0	0.0	3.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.6	23.7	7.9	0.0	0.0	8.0
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	843		2327			2360
Approach Delay, s/veh	21.6		7.9			8.0
Approach LOS	C		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		37.8			37.8	18.4
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		36.5			36.5	19.5
Max Q Clear Time (g_c+I1), s		16.1			16.5	11.8
Green Ext Time (p_c), s		16.9			16.8	2.1

Intersection Summary	
HCM 6th Ctrl Delay	10.0
HCM 6th LOS	B

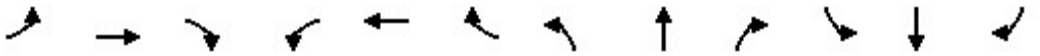
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			146			136			281			55
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



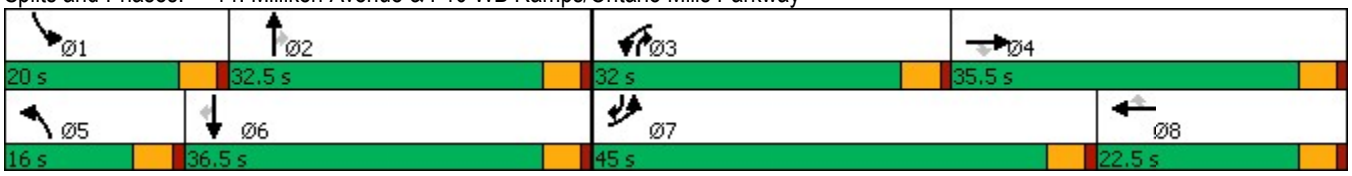
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	775	197	237	253	301	63	240	1020	453	332	1073	479
Future Volume (vph)	775	197	237	253	301	63	240	1020	453	332	1073	479
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	807	205	247	264	314	66	250	1063	472	346	1118	499
Shared Lane Traffic (%)												
Lane Group Flow (vph)	807	205	247	264	314	66	250	1063	472	346	1118	499

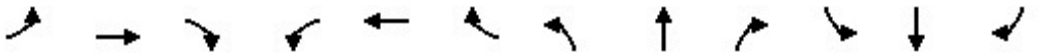
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	775	197	237	253	301	63	240	1020	453	332	1073	479
Future Volume (vph)	775	197	237	253	301	63	240	1020	453	332	1073	479
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	45.0	35.5	35.5	32.0	22.5	22.5	16.0	32.5	32.0	20.0	36.5	45.0
Total Split (%)	37.5%	29.6%	29.6%	26.7%	18.8%	18.8%	13.3%	27.1%	26.7%	16.7%	30.4%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	35.9	34.9	34.9	16.3	15.2	15.2	11.6	26.1	46.9	15.5	29.9	70.3
Actuated g/C Ratio	0.32	0.31	0.31	0.15	0.14	0.14	0.10	0.24	0.42	0.14	0.27	0.63
v/c Ratio	0.86	0.37	0.43	0.62	0.68	0.20	0.83	0.75	0.59	0.86	0.68	0.51
Control Delay	46.2	32.8	15.6	52.0	54.7	1.4	72.9	43.8	12.7	69.6	39.4	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	32.8	15.6	52.0	54.7	1.4	72.9	43.8	12.7	69.6	39.4	11.9
LOS	D	C	B	D	D	A	E	D	B	E	D	B
Approach Delay		38.0			48.2			39.6			37.7	
Approach LOS		D			D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 110.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 39.6	Intersection LOS: D
Intersection Capacity Utilization 76.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway

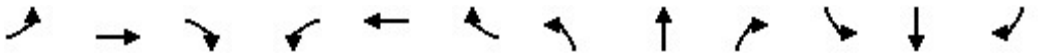




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	807	205	247	264	314	66	250	1063	472	346	1118	499
v/c Ratio	0.86	0.37	0.43	0.62	0.68	0.20	0.83	0.75	0.59	0.86	0.68	0.51
Control Delay	46.2	32.8	15.6	52.0	54.7	1.4	72.9	43.8	12.7	69.6	39.4	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	32.8	15.6	52.0	54.7	1.4	72.9	43.8	12.7	69.6	39.4	11.9
Queue Length 50th (ft)	287	117	55	98	121	0	97	217	103	135	220	159
Queue Length 95th (ft)	376	197	137	138	171	0	#178	265	199	#229	267	251
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	1069	574	586	726	551	360	303	1552	923	409	1774	1038
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.36	0.42	0.36	0.57	0.18	0.83	0.68	0.51	0.85	0.63	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	775	197	237	253	301	63	240	1020	453	332	1073	479
Future Volume (veh/h)	775	197	237	253	301	63	240	1020	453	332	1073	479
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	807	205	247	264	314	66	250	1062	472	346	1118	499
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	896	556	471	334	405	181	301	1613	570	398	1816	910
Arrive On Green	0.31	0.31	0.31	0.11	0.12	0.12	0.10	0.26	0.26	0.14	0.30	0.30
Sat Flow, veh/h	2910	1772	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	807	205	247	264	314	66	250	1062	472	346	1118	499
Grp Sat Flow(s),veh/h/ln	1455	1772	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	28.1	9.5	14.3	9.3	9.6	4.3	8.9	16.4	28.0	12.3	16.7	20.8
Cycle Q Clear(g_c), s	28.1	9.5	14.3	9.3	9.6	4.3	8.9	16.4	28.0	12.3	16.7	20.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	896	556	471	334	405	181	301	1613	570	398	1816	910
V/C Ratio(X)	0.90	0.37	0.52	0.79	0.77	0.37	0.83	0.66	0.83	0.87	0.62	0.55
Avail Cap(c_a), veh/h	1114	556	471	756	573	255	316	1613	570	426	1844	917
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.1	28.2	29.8	45.6	45.1	42.8	46.5	34.6	29.7	44.7	31.9	12.3
Incr Delay (d2), s/veh	8.7	0.4	1.1	4.2	4.3	1.2	16.1	1.0	9.9	16.4	0.6	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.8	4.1	5.2	3.6	4.2	1.6	3.9	6.1	12.1	5.3	6.1	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.7	28.6	30.9	49.8	49.4	44.0	62.6	35.6	39.6	61.1	32.5	13.0
LnGrp LOS	D	C	C	D	D	D	E	D	D	E	C	B
Approach Vol, veh/h		1259			644			1784			1963	
Approach Delay, s/veh		38.7			49.0			40.5			32.6	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	32.5	16.6	37.7	15.5	36.0	37.1	17.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	28.0	27.5	31.0	11.5	32.0	40.5	18.0
Max Q Clear Time (g_c+I1), s	14.3	30.0	11.3	16.3	10.9	22.8	30.1	11.6
Green Ext Time (p_c), s	0.2	0.0	0.8	1.8	0.1	6.1	2.5	1.2

Intersection Summary	
HCM 6th Ctrl Delay	38.3
HCM 6th LOS	D

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.993	0.850				
Flt Protected	0.955					
Satd. Flow (prot)	3066	1365	0	6071	6071	0
Flt Permitted	0.955					
Satd. Flow (perm)	3066	1365	0	6071	6071	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	6	14				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

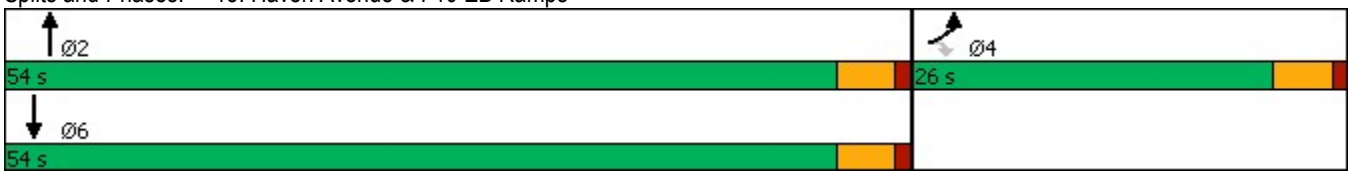
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	505	247	0	2465	1900	0
Future Volume (vph)	505	247	0	2465	1900	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	526	257	0	2568	1979	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	552	231	0	2568	1979	0

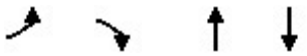
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	505	247	2465	1900
Future Volume (vph)	505	247	2465	1900
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	54.0	54.0
Total Split (%)	32.5%	32.5%	67.5%	67.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	18.3	18.3	49.6	49.6
Actuated g/C Ratio	0.24	0.24	0.64	0.64
v/c Ratio	0.75	0.69	0.66	0.51
Control Delay	33.9	36.4	9.8	8.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	33.9	36.4	9.8	8.1
LOS	C	D	A	A
Approach Delay	34.6		9.8	8.1
Approach LOS	C		A	A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 76.9	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 12.8	Intersection LOS: B
Intersection Capacity Utilization 64.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	552	231	2568	1979
v/c Ratio	0.75	0.69	0.66	0.51
Control Delay	33.9	36.4	9.8	8.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	33.9	36.4	9.8	8.1
Queue Length 50th (ft)	125	103	204	134
Queue Length 95th (ft)	178	186	259	173
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	862	392	3912	3912
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.64	0.59	0.66	0.51

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	505	247	0	2465	1900	0
Future Volume (veh/h)	505	247	0	2465	1900	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1772	0	1772	1772	0
Adj Flow Rate, veh/h	526	257	0	2568	1979	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	701	330	0	3959	3959	0
Arrive On Green	0.22	0.22	0.00	0.65	0.65	0.00
Sat Flow, veh/h	3188	1502	0	6592	6592	0
Grp Volume(v), veh/h	526	257	0	2568	1979	0
Grp Sat Flow(s),veh/h/ln	1594	1502	0	1524	1524	0
Q Serve(g_s), s	10.6	11.1	0.0	17.6	11.6	0.0
Cycle Q Clear(g_c), s	10.6	11.1	0.0	17.6	11.6	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	701	330	0	3959	3959	0
V/C Ratio(X)	0.75	0.78	0.00	0.65	0.50	0.00
Avail Cap(c_a), veh/h	995	469	0	4380	4380	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.1	25.3	0.0	7.3	6.3	0.0
Incr Delay (d2), s/veh	2.0	5.3	0.0	0.3	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	4.2	0.0	4.3	2.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	27.1	30.6	0.0	7.6	6.4	0.0
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	783			2568	1979	
Approach Delay, s/veh	28.2			7.6	6.4	
Approach LOS	C			A	A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		49.2		19.6		49.2
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		49.5		21.5		49.5
Max Q Clear Time (g_c+I1), s		19.6		13.1		13.6
Green Ext Time (p_c), s		25.2		2.0		22.0

Intersection Summary	
HCM 6th Ctrl Delay	10.2
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1600	1800	1600	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2891	1500	2891	6071	6071	1500
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2891	1500	2891	6071	6071	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		9				83
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	513	202	326	1206	1018	562
Future Volume (vph)	513	202	326	1206	1018	562
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	529	208	336	1243	1049	579
Shared Lane Traffic (%)						
Lane Group Flow (vph)	529	208	336	1243	1049	579

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	513	202	326	1206	1018	562
Future Volume (vph)	513	202	326	1206	1018	562
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	22.5	14.9	14.9	37.5	22.6	22.5
Total Split (%)	37.5%	24.8%	24.8%	62.5%	37.7%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	15.3	29.8	9.9	31.0	16.6	36.5
Actuated g/C Ratio	0.28	0.54	0.18	0.56	0.30	0.66
v/c Ratio	0.66	0.26	0.65	0.37	0.58	0.57
Control Delay	22.6	7.8	29.4	7.4	18.4	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.6	7.8	29.4	7.4	18.4	6.9
LOS	C	A	C	A	B	A
Approach Delay	18.4			12.1	14.3	
Approach LOS	B			B	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 55.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 55.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	529	208	336	1243	1049	579
v/c Ratio	0.66	0.26	0.65	0.37	0.58	0.57
Control Delay	22.6	7.8	29.4	7.4	18.4	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.6	7.8	29.4	7.4	18.4	6.9
Queue Length 50th (ft)	83	34	58	64	90	70
Queue Length 95th (ft)	128	66	#100	86	121	135
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	952	827	550	3666	2010	1089
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.25	0.61	0.34	0.52	0.53

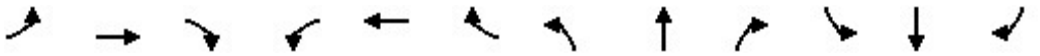
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	513	202	326	1206	1018	562
Future Volume (veh/h)	513	202	326	1206	1018	562
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1772	1575	1772	1772	1772
Adj Flow Rate, veh/h	529	208	336	1243	1049	579
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	704	595	450	3553	2077	875
Arrive On Green	0.24	0.24	0.15	0.58	0.34	0.34
Sat Flow, veh/h	2910	1502	2910	6343	6343	1502
Grp Volume(v), veh/h	529	208	336	1243	1049	579
Grp Sat Flow(s),veh/h/ln	1455	1502	1455	1524	1524	1502
Q Serve(g_s), s	8.7	5.0	5.7	5.5	7.0	13.5
Cycle Q Clear(g_c), s	8.7	5.0	5.7	5.5	7.0	13.5
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	704	595	450	3553	2077	875
V/C Ratio(X)	0.75	0.35	0.75	0.35	0.51	0.66
Avail Cap(c_a), veh/h	1019	758	589	3915	2147	892
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.0	10.9	20.8	5.6	13.5	7.3
Incr Delay (d2), s/veh	1.9	0.4	3.7	0.1	0.2	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	4.8	2.0	1.2	2.1	6.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.9	11.2	24.5	5.7	13.7	9.1
LnGrp LOS	B	B	C	A	B	A
Approach Vol, veh/h	737			1579	1628	
Approach Delay, s/veh	17.5			9.7	12.0	
Approach LOS	B			A	B	

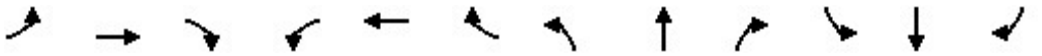
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		34.5		16.9	12.4	22.0
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		33.0		18.0	10.4	18.1
Max Q Clear Time (g_c+I1), s		7.5		10.7	7.7	15.5
Green Ext Time (p_c), s		10.3		1.8	0.3	2.1

Intersection Summary	
HCM 6th Ctrl Delay	12.1
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.972				0.850			0.850		0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4683	0	2891	3353	1500	2891	4818	1500	2891	6010	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4683	0	2891	3353	1500	2891	4818	1500	2891	6010	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		50				181			262		15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



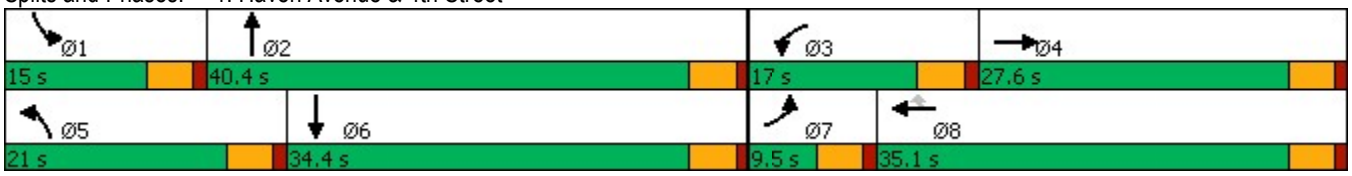
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	52	551	128	207	523	170	185	1148	361	176	1115	79
Future Volume (vph)	52	551	128	207	523	170	185	1148	361	176	1115	79
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	55	586	136	220	556	181	197	1221	384	187	1186	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	722	0	220	556	181	197	1221	384	187	1270	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	52	551	207	523	170	185	1148	361	176	1115
Future Volume (vph)	52	551	207	523	170	185	1148	361	176	1115
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	9.5	27.6	17.0	35.1	35.1	21.0	40.4		15.0	34.4
Total Split (%)	9.5%	27.6%	17.0%	35.1%	35.1%	21.0%	40.4%		15.0%	34.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	5.0	20.0	11.3	28.4	28.4	11.8	36.0	95.2	9.8	34.1
Actuated g/C Ratio	0.05	0.21	0.12	0.30	0.30	0.12	0.38	1.00	0.10	0.36
v/c Ratio	0.36	0.71	0.64	0.56	0.32	0.55	0.67	0.26	0.63	0.59
Control Delay	52.4	36.7	49.9	31.1	5.6	45.7	27.6	0.4	51.8	27.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.4	36.7	49.9	31.1	5.6	45.7	27.6	0.4	51.8	27.0
LOS	D	D	D	C	A	D	C	A	D	C
Approach Delay		37.8		30.6			23.8			30.2
Approach LOS		D		C			C			C

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 95.2	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 29.1	Intersection LOS: C
Intersection Capacity Utilization 65.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Haven Avenue & 4th Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	55	722	220	556	181	197	1221	384	187	1270
v/c Ratio	0.36	0.71	0.64	0.56	0.32	0.55	0.67	0.26	0.63	0.59
Control Delay	52.4	36.7	49.9	31.1	5.6	45.7	27.6	0.4	51.8	27.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.4	36.7	49.9	31.1	5.6	45.7	27.6	0.4	51.8	27.0
Queue Length 50th (ft)	17	142	67	154	0	60	232	0	58	183
Queue Length 95th (ft)	38	185	108	208	48	94	294	0	96	243
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	152	1178	381	1081	606	502	1822	1500	319	2160
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.61	0.58	0.51	0.30	0.39	0.67	0.26	0.59	0.59

Intersection Summary

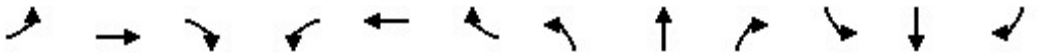
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	551	128	207	523	170	185	1148	361	176	1115	79
Future Volume (veh/h)	52	551	128	207	523	170	185	1148	361	176	1115	79
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	55	586	136	220	556	181	197	1221	0	187	1186	84
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	122	790	180	288	867	387	269	1978		252	2360	166
Arrive On Green	0.04	0.20	0.20	0.10	0.26	0.26	0.09	0.41	0.00	0.09	0.40	0.40
Sat Flow, veh/h	2910	3939	897	2910	3367	1502	2910	4837	1502	2910	5856	413
Grp Volume(v), veh/h	55	478	244	220	556	181	197	1221	0	187	925	345
Grp Sat Flow(s),veh/h/ln	1455	1612	1611	1455	1683	1502	1455	1612	1502	1455	1524	1698
Q Serve(g_s), s	1.6	12.2	12.5	6.5	12.9	8.9	5.8	17.5	0.0	5.5	13.3	13.4
Cycle Q Clear(g_c), s	1.6	12.2	12.5	6.5	12.9	8.9	5.8	17.5	0.0	5.5	13.3	13.4
Prop In Lane	1.00		0.56	1.00		1.00	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	122	647	323	288	867	387	269	1978		252	1842	684
V/C Ratio(X)	0.45	0.74	0.76	0.76	0.64	0.47	0.73	0.62		0.74	0.50	0.50
Avail Cap(c_a), veh/h	166	849	424	414	1174	523	547	1978		348	1842	684
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.1	32.9	33.1	38.5	29.0	27.5	38.8	20.5	0.0	39.1	19.6	19.6
Incr Delay (d2), s/veh	2.6	2.4	5.5	5.1	0.8	0.9	3.8	1.5	0.0	5.4	1.0	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	4.9	5.3	2.5	5.2	3.2	2.2	6.5	0.0	2.1	4.7	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.6	35.4	38.6	43.6	29.8	28.4	42.6	22.0	0.0	44.6	20.6	22.3
LnGrp LOS	D	D	D	D	C	C	D	C		D	C	C
Approach Vol, veh/h		777			957			1418	A		1457	
Approach Delay, s/veh		37.0			32.7			24.8			24.1	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.1	40.4	13.2	22.1	12.6	39.9	8.2	27.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	35.9	12.5	23.1	16.5	29.9	5.0	30.6
Max Q Clear Time (g_c+I1), s	7.5	19.5	8.5	14.5	7.8	15.4	3.6	14.9
Green Ext Time (p_c), s	0.2	8.0	0.3	3.1	0.4	7.4	0.0	4.0

Intersection Summary	
HCM 6th Ctrl Delay	28.3
HCM 6th LOS	C

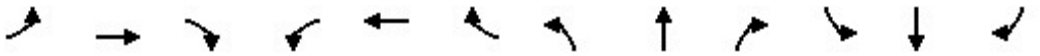
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt						0.850			0.850		0.850	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	1667	6071	0	1583	4818	1500	1667	1765	1500	1583	2850	0
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	1667	6071	0	1583	4818	1500	1667	1765	1500	1583	2850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				153			386		399	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



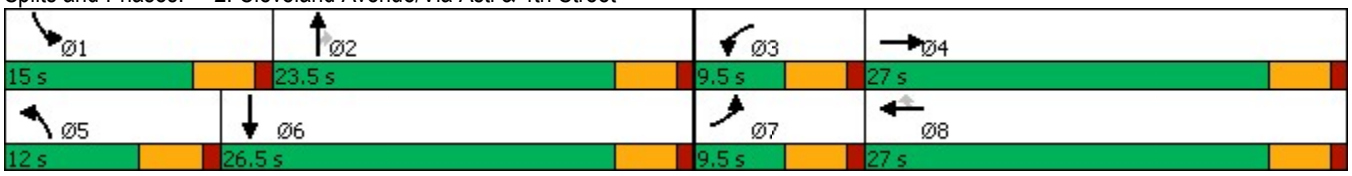
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	1170	4	3	912	4	0	0	4	3	0	1
Future Volume (vph)	0	1170	4	3	912	4	0	0	4	3	0	1
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1206	4	3	940	4	0	0	4	3	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1210	0	3	940	4	0	0	4	3	1	0

Intersection Summary

Lane Group	EBT	WBL	WBT	WBR	NBR	SBL	SBT	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	1170	3	912	4	4	3	0		
Future Volume (vph)	1170	3	912	4	4	3	0		
Turn Type	NA	Prot	NA	Perm	Perm	Prot	NA		
Protected Phases	4	3	8			1	6	5	7
Permitted Phases				8	2				
Detector Phase	4	3	8	8	2	1	6		
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	22.5	22.5	22.5	9.5	22.5	9.5	9.5
Total Split (s)	27.0	9.5	27.0	27.0	23.5	15.0	26.5	12.0	9.5
Total Split (%)	36.0%	12.7%	36.0%	36.0%	31.3%	20.0%	35.3%	16%	13%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		
Lead/Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	None	Min	None	None
Act Effct Green (s)	17.4	5.4	18.6	18.6	5.9	6.0	7.2		
Actuated g/C Ratio	0.49	0.15	0.52	0.52	0.17	0.17	0.20		
v/c Ratio	0.41	0.01	0.37	0.00	0.01	0.01	0.00		
Control Delay	7.2	19.3	5.5	0.0	0.0	18.3	0.0		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	7.2	19.3	5.5	0.0	0.0	18.3	0.0		
LOS	A	B	A	A	A	B	A		
Approach Delay	7.2		5.5				13.8		
Approach LOS	A		A				B		

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 35.5	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay: 6.5	Intersection LOS: A
Intersection Capacity Utilization 37.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street



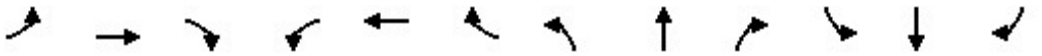
Lane Group	EBT	WBL	WBT	WBR	NBR	SBL	SBT
Lane Group Flow (vph)	1210	3	940	4	4	3	1
v/c Ratio	0.41	0.01	0.37	0.00	0.01	0.01	0.00
Control Delay	7.2	19.3	5.5	0.0	0.0	18.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.2	19.3	5.5	0.0	0.0	18.3	0.0
Queue Length 50th (ft)	25	1	25	0	0	1	0
Queue Length 95th (ft)	115	8	78	0	0	7	0
Internal Link Dist (ft)	2546		362				358
Turn Bay Length (ft)		130		145	165	50	
Base Capacity (vph)	4135	239	3442	1115	1026	503	2031
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.01	0.27	0.00	0.00	0.01	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1170	4	3	912	4	0	0	4	3	0	1
Future Volume (veh/h)	0	1170	4	3	912	4	0	0	4	3	0	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	0	1206	4	3	940	4	0	0	4	3	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	4	2442	8	7	2462	764	4	233	198	7	428	382
Arrive On Green	0.00	0.39	0.39	0.00	0.51	0.51	0.00	0.00	0.13	0.00	0.00	0.25
Sat Flow, veh/h	1594	6319	21	1594	4837	1502	1594	1772	1502	1594	1683	1502
Grp Volume(v), veh/h	0	872	338	3	940	4	0	0	4	3	0	1
Grp Sat Flow(s),veh/h/ln	1594	1524	1768	1594	1612	1502	1594	1772	1502	1594	1683	1502
Q Serve(g_s), s	0.0	5.5	5.5	0.1	4.5	0.0	0.0	0.0	0.1	0.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	5.5	5.5	0.1	4.5	0.0	0.0	0.0	0.1	0.1	0.0	0.0
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	4	1767	683	7	2462	764	4	233	198	7	428	382
V/C Ratio(X)	0.00	0.49	0.49	0.46	0.38	0.01	0.00	0.00	0.02	0.46	0.00	0.00
Avail Cap(c_a), veh/h	210	2707	1047	210	2864	889	315	886	751	440	975	869
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	8.8	8.8	18.9	5.7	4.6	0.0	0.0	14.4	18.9	0.0	10.6
Incr Delay (d2), s/veh	0.0	0.2	0.6	42.9	0.1	0.0	0.0	0.0	0.0	42.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.3	1.6	0.1	0.9	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	9.1	9.4	61.8	5.8	4.6	0.0	0.0	14.4	61.8	0.0	10.6
LnGrp LOS	A	A	A	E	A	A	A	A	B	E	A	B
Approach Vol, veh/h		1210			947			4			4	
Approach Delay, s/veh		9.1			6.0			14.4			49.0	
Approach LOS		A			A			B			D	

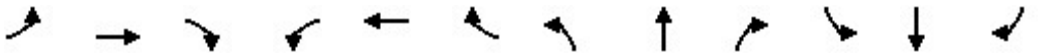
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	9.5	4.7	19.2	0.0	14.2	0.0	23.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	19.0	5.0	22.5	7.5	22.0	5.0	22.5
Max Q Clear Time (g_c+I1), s	2.1	2.1	2.1	7.5	0.0	2.0	0.0	6.5
Green Ext Time (p_c), s	0.0	0.0	0.0	7.2	0.0	0.0	0.0	6.0

Intersection Summary	
HCM 6th Ctrl Delay	7.8
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.992				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.953	
Satd. Flow (prot)	2891	6065	0	1583	4779	0	1583	1765	1500	0	1682	1500
Flt Permitted	0.950			0.950			0.725				0.731	
Satd. Flow (perm)	2891	6065	0	1583	4779	0	1208	1765	1500	0	1290	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			15				225			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



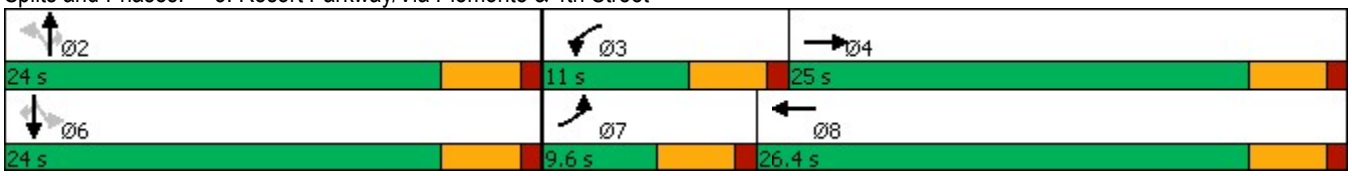
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	11	1151	8	5	884	47	3	0	8	47	1	16
Future Volume (vph)	11	1151	8	5	884	47	3	0	8	47	1	16
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	1187	8	5	911	48	3	0	8	48	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	1195	0	5	959	0	3	0	8	0	49	16

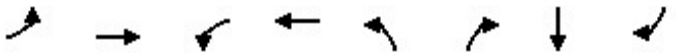
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	11	1151	5	884	3	8	47	1	16
Future Volume (vph)	11	1151	5	884	3	8	47	1	16
Turn Type	Prot	NA	Prot	NA	Perm	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8				6	
Permitted Phases					2	2	6		6
Detector Phase	7	4	3	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.6	25.0	11.0	26.4	24.0	24.0	24.0	24.0	24.0
Total Split (%)	16.0%	41.7%	18.3%	44.0%	40.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min
Act Effct Green (s)	5.4	16.7	6.0	16.9	7.0	7.0		7.0	7.0
Actuated g/C Ratio	0.16	0.48	0.17	0.49	0.20	0.20		0.20	0.20
v/c Ratio	0.02	0.41	0.02	0.41	0.01	0.02		0.19	0.04
Control Delay	17.2	6.9	16.6	6.8	14.7	0.1		16.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	17.2	6.9	16.6	6.8	14.7	0.1		16.2	0.2
LOS	B	A	B	A	B	A		B	A
Approach Delay		7.0		6.8				12.2	
Approach LOS		A		A				B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 34.7	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay: 7.0	Intersection LOS: A
Intersection Capacity Utilization 38.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street





Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBT	SBR
Lane Group Flow (vph)	11	1195	5	959	3	8	49	16
v/c Ratio	0.02	0.41	0.02	0.41	0.01	0.02	0.19	0.04
Control Delay	17.2	6.9	16.6	6.8	14.7	0.1	16.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.2	6.9	16.6	6.8	14.7	0.1	16.2	0.2
Queue Length 50th (ft)	1	29	1	28	1	0	7	0
Queue Length 95th (ft)	7	93	9	93	6	0	35	0
Internal Link Dist (ft)		362		428			378	
Turn Bay Length (ft)	220		125		115	115		110
Base Capacity (vph)	447	3779	312	3179	714	979	762	931
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.32	0.02	0.30	0.00	0.01	0.06	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1151	8	5	884	47	3	0	8	47	1	16
Future Volume (veh/h)	11	1151	8	5	884	47	3	0	8	47	1	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	11	1187	8	5	911	48	3	0	8	48	1	16
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	42	2604	18	11	1910	100	393	278	235	438	7	235
Arrive On Green	0.01	0.41	0.41	0.01	0.41	0.41	0.16	0.00	0.16	0.16	0.16	0.16
Sat Flow, veh/h	2910	6293	42	1594	4705	247	1318	1772	1502	1373	43	1502
Grp Volume(v), veh/h	11	862	333	5	624	335	3	0	8	49	0	16
Grp Sat Flow(s),veh/h/ln	1455	1524	1764	1594	1612	1727	1318	1772	1502	1416	0	1502
Q Serve(g_s), s	0.1	4.3	4.4	0.1	4.5	4.6	0.1	0.0	0.1	0.9	0.0	0.3
Cycle Q Clear(g_c), s	0.1	4.3	4.4	0.1	4.5	4.6	1.0	0.0	0.1	1.0	0.0	0.3
Prop In Lane	1.00		0.02	1.00		0.14	1.00		1.00	0.98		1.00
Lane Grp Cap(c), veh/h	42	1891	730	11	1309	701	393	278	235	445	0	235
V/C Ratio(X)	0.26	0.46	0.46	0.46	0.48	0.48	0.01	0.00	0.03	0.11	0.00	0.07
Avail Cap(c_a), veh/h	465	2935	1133	324	2212	1185	991	1082	917	1087	0	917
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.6	6.8	6.8	15.8	7.0	7.0	12.2	0.0	11.4	11.8	0.0	11.5
Incr Delay (d2), s/veh	3.2	0.2	0.4	27.7	0.3	0.5	0.0	0.0	0.1	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.9	1.0	0.1	1.0	1.1	0.0	0.0	0.0	0.2	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.8	6.9	7.2	43.5	7.3	7.5	12.2	0.0	11.5	11.9	0.0	11.6
LnGrp LOS	B	A	A	D	A	A	B	A	B	B	A	B
Approach Vol, veh/h		1206			964			11			65	
Approach Delay, s/veh		7.1			7.5			11.7			11.8	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	4.7	17.7		9.5	5.0	17.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		19.5	6.5	20.5		19.5	5.1	21.9				
Max Q Clear Time (g_c+I1), s		3.0	2.1	6.4		3.0	2.1	6.6				
Green Ext Time (p_c), s		0.0	0.0	6.9		0.2	0.0	5.7				

Intersection Summary	
HCM 6th Ctrl Delay	7.5
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.991					0.865
Flt Protected						
Satd. Flow (prot)	4774	0	0	4818	0	1526
Flt Permitted						
Satd. Flow (perm)	4774	0	0	4818	0	1526
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	1131	75	0	957	0	16
Future Volume (vph)	1131	75	0	957	0	16
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1191	79	0	1007	0	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1270	0	0	1007	0	17

Intersection Summary

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1131	75	0	957	0	16
Future Vol, veh/h	1131	75	0	957	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1191	79	0	1007	0	17

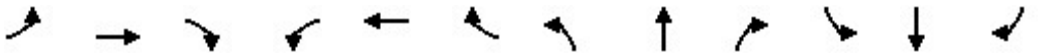
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	635
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	361
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	361
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	361	-	-	-
HCM Lane V/C Ratio	0.047	-	-	-
HCM Control Delay (s)	15.5	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.977	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5931	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5931	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			257			293			95		38	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



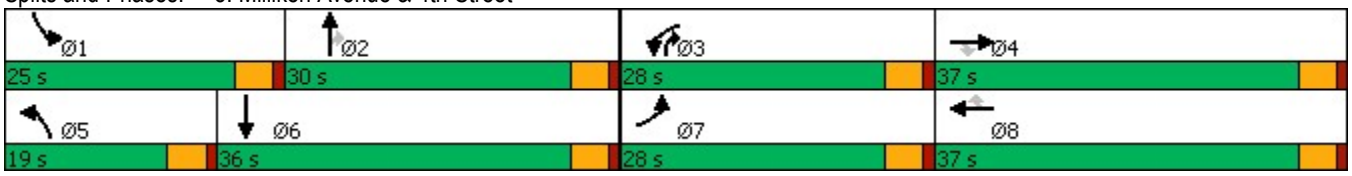
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	274	918	283	527	662	278	207	853	364	390	825	152
Future Volume (vph)	274	918	283	527	662	278	207	853	364	390	825	152
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	288	966	298	555	697	293	218	898	383	411	868	160
Shared Lane Traffic (%)												
Lane Group Flow (vph)	288	966	298	555	697	293	218	898	383	411	1028	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	274	918	283	527	662	278	207	853	364	390	825
Future Volume (vph)	274	918	283	527	662	278	207	853	364	390	825
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	28.0	37.0	37.0	28.0	37.0	37.0	19.0	30.0	28.0	25.0	36.0
Total Split (%)	23.3%	30.8%	30.8%	23.3%	30.8%	30.8%	15.8%	25.0%	23.3%	20.8%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	16.8	30.4	30.4	23.6	37.3	37.3	12.9	23.6	51.7	19.3	29.9
Actuated g/C Ratio	0.15	0.26	0.26	0.21	0.32	0.32	0.11	0.21	0.45	0.17	0.26
v/c Ratio	0.68	0.76	0.51	0.94	0.45	0.43	0.67	0.72	0.53	0.85	0.65
Control Delay	55.7	43.6	10.2	70.4	32.9	5.8	60.6	46.7	20.3	64.2	39.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.7	43.6	10.2	70.4	32.9	5.8	60.6	46.7	20.3	64.2	39.1
LOS	E	D	B	E	C	A	E	D	C	E	D
Approach Delay		39.4			41.2			42.0			46.2
Approach LOS		D			D			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 115	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 42.2	Intersection LOS: D
Intersection Capacity Utilization 77.8%	ICU Level of Service D
Analysis Period (min) 15	

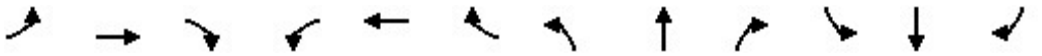
Splits and Phases: 5: Milliken Avenue & 4th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	288	966	298	555	697	293	218	898	383	411	1028
v/c Ratio	0.68	0.76	0.51	0.94	0.45	0.43	0.67	0.72	0.53	0.85	0.65
Control Delay	55.7	43.6	10.2	70.4	32.9	5.8	60.6	46.7	20.3	64.2	39.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.7	43.6	10.2	70.4	32.9	5.8	60.6	46.7	20.3	64.2	39.1
Queue Length 50th (ft)	110	250	24	222	156	0	84	188	157	160	198
Queue Length 95th (ft)	151	302	104	#338	207	66	126	227	252	#239	238
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	593	1368	610	593	1562	684	366	1353	726	517	1662
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.71	0.49	0.94	0.45	0.43	0.60	0.66	0.53	0.79	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



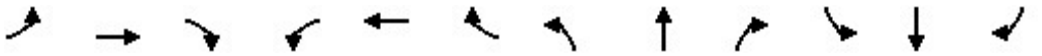
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	274	918	283	527	662	278	207	853	364	390	825	152
Future Volume (veh/h)	274	918	283	527	662	278	207	853	364	390	825	152
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	288	966	298	555	697	293	218	898	383	411	868	160
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	352	1214	377	600	1625	505	272	1358	644	466	1513	274
Arrive On Green	0.12	0.25	0.25	0.21	0.34	0.34	0.09	0.22	0.22	0.16	0.29	0.29
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	2910	6095	1502	2910	5228	946
Grp Volume(v), veh/h	288	966	298	555	697	293	218	898	383	411	757	271
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1455	1524	1502	1455	1524	1602
Q Serve(g_s), s	10.9	21.0	20.8	21.0	12.6	18.1	8.3	15.1	22.0	15.5	15.9	16.3
Cycle Q Clear(g_c), s	10.9	21.0	20.8	21.0	12.6	18.1	8.3	15.1	22.0	15.5	15.9	16.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.59
Lane Grp Cap(c), veh/h	352	1214	377	600	1625	505	272	1358	644	466	1323	464
V/C Ratio(X)	0.82	0.80	0.79	0.93	0.43	0.58	0.80	0.66	0.59	0.88	0.57	0.58
Avail Cap(c_a), veh/h	608	1399	434	608	1625	505	375	1383	650	531	1323	464
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.2	39.4	39.4	43.8	29.0	30.8	49.9	39.8	24.6	46.2	34.0	34.2
Incr Delay (d2), s/veh	4.7	2.9	8.4	20.1	0.2	1.7	8.3	1.2	1.4	14.6	0.6	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	8.6	8.5	9.2	4.9	6.7	3.3	5.7	7.9	6.5	5.9	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.9	42.3	47.8	63.9	29.1	32.5	58.3	41.0	26.1	60.8	34.6	36.0
LnGrp LOS	D	D	D	E	C	C	E	D	C	E	C	D
Approach Vol, veh/h		1552			1545			1499			1439	
Approach Delay, s/veh		45.3			42.3			39.7			42.4	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.5	29.5	27.7	32.7	15.0	37.0	18.1	42.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	20.5	25.5	23.5	32.5	14.5	31.5	23.5	32.5
Max Q Clear Time (g_c+I1), s	17.5	24.0	23.0	23.0	10.3	18.3	12.9	20.1
Green Ext Time (p_c), s	0.5	1.1	0.1	5.2	0.3	5.8	0.7	4.7

Intersection Summary	
HCM 6th Ctrl Delay	42.4
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.947	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	3042	1365
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	3042	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			163			277			373		79	402
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



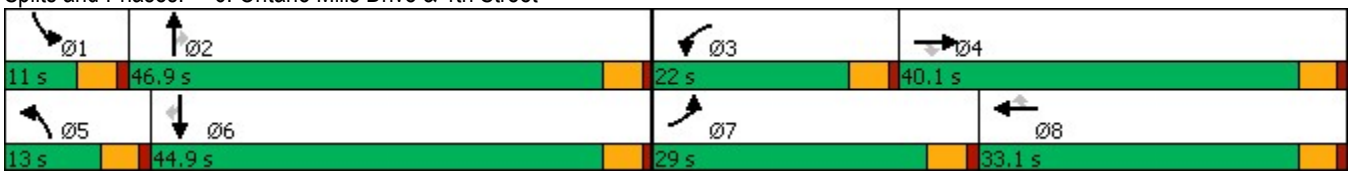
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	730	1067	156	410	880	420	182	318	488	68	632	775
Future Volume (vph)	730	1067	156	410	880	420	182	318	488	68	632	775
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	760	1111	163	427	917	438	190	331	508	71	658	807
Shared Lane Traffic (%)												44%
Lane Group Flow (vph)	760	1111	163	427	917	438	190	331	508	71	1013	452

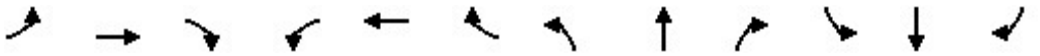
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	730	1067	156	410	880	420	182	318	488	68	632	775
Future Volume (vph)	730	1067	156	410	880	420	182	318	488	68	632	775
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	29.0	40.1	40.1	22.0	33.1	33.1	13.0	46.9	46.9	11.0	44.9	44.9
Total Split (%)	24.2%	33.4%	33.4%	18.3%	27.6%	27.6%	10.8%	39.1%	39.1%	9.2%	37.4%	37.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	24.5	35.0	35.0	17.5	28.0	28.0	8.5	42.2	42.2	6.5	40.2	40.2
Actuated g/C Ratio	0.21	0.29	0.29	0.15	0.23	0.23	0.07	0.35	0.35	0.05	0.34	0.34
v/c Ratio	1.28	0.79	0.29	1.01	0.81	0.78	1.68	0.28	0.66	0.83	0.94	0.62
Control Delay	177.7	43.4	6.2	96.5	49.8	25.9	378.5	28.5	12.9	115.0	51.9	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	177.7	43.4	6.2	96.5	49.8	25.9	378.5	28.5	12.9	115.0	51.9	9.0
LOS	F	D	A	F	D	C	F	C	B	F	D	A
Approach Delay		90.6			55.1			85.4			42.2	
Approach LOS		F			E			F			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.2	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.68	
Intersection Signal Delay: 68.2	Intersection LOS: E
Intersection Capacity Utilization 96.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 6: Ontario Mills Drive & 4th Street



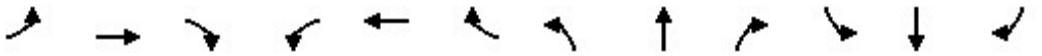


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	760	1111	163	427	917	438	190	331	508	71	1013	452
v/c Ratio	1.28	0.79	0.29	1.01	0.81	0.78	1.68	0.28	0.66	0.83	0.94	0.62
Control Delay	177.7	43.4	6.2	96.5	49.8	25.9	378.5	28.5	12.9	115.0	51.9	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	177.7	43.4	6.2	96.5	49.8	25.9	378.5	28.5	12.9	115.0	51.9	9.0
Queue Length 50th (ft)	~386	287	0	~175	246	118	~216	96	78	56	390	29
Queue Length 95th (ft)	#508	344	50	#283	299	254	#366	134	205	#144	#536	141
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	594	1438	562	424	1155	570	113	1192	774	86	1083	728
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.28	0.77	0.29	1.01	0.79	0.77	1.68	0.28	0.66	0.83	0.94	0.62

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



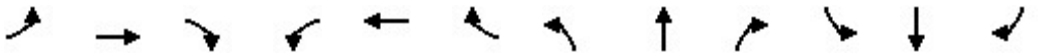
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	730	1067	156	410	880	420	182	318	488	68	632	775
Future Volume (veh/h)	730	1067	156	410	880	420	182	318	488	68	632	775
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	760	1111	162	427	917	438	190	331	508	71	648	814
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	594	1435	445	424	1153	358	113	1190	531	86	597	1011
Arrive On Green	0.20	0.30	0.30	0.15	0.24	0.24	0.07	0.35	0.35	0.05	0.34	0.34
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	1594	3367	1502	1594	1772	3003
Grp Volume(v), veh/h	760	1111	162	427	917	438	190	331	508	71	648	814
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1594	1683	1502	1594	1772	1502
Q Serve(g_s), s	24.5	25.2	10.2	17.5	21.4	28.6	8.5	8.5	39.7	5.3	40.4	29.6
Cycle Q Clear(g_c), s	24.5	25.2	10.2	17.5	21.4	28.6	8.5	8.5	39.7	5.3	40.4	29.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	594	1435	445	424	1153	358	113	1190	531	86	597	1011
V/C Ratio(X)	1.28	0.77	0.36	1.01	0.80	1.22	1.68	0.28	0.96	0.82	1.09	0.81
Avail Cap(c_a), veh/h	594	1435	445	424	1153	358	113	1190	531	86	597	1011
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.8	38.5	33.3	51.3	43.0	45.7	55.8	27.8	37.9	56.2	39.8	36.2
Incr Delay (d2), s/veh	138.2	2.7	0.5	45.2	4.0	123.2	342.6	0.1	28.6	44.7	62.4	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.2	10.2	3.8	9.0	8.9	22.8	14.2	3.4	18.5	3.2	27.6	11.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	186.0	41.2	33.8	96.5	46.9	168.9	398.3	28.0	66.5	100.9	102.2	41.1
LnGrp LOS	F	D	C	F	D	F	F	C	E	F	F	D
Approach Vol, veh/h		2033			1782			1029			1533	
Approach Delay, s/veh		94.8			88.8			115.4			69.7	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	46.9	22.0	40.1	13.0	44.9	29.0	33.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	42.4	17.5	35.6	8.5	40.4	24.5	28.6
Max Q Clear Time (g_c+I1), s	7.3	41.7	19.5	27.2	10.5	42.4	26.5	30.6
Green Ext Time (p_c), s	0.0	0.3	0.0	5.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	90.4
HCM 6th LOS	F

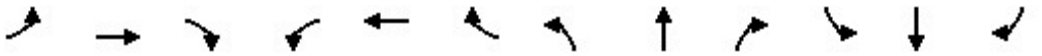
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.981			0.939				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.996	
Satd. Flow (prot)	2891	4818	1500	1583	4726	0	1583	3148	0	1504	1670	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.996	
Satd. Flow (perm)	2891	4818	1500	1583	4726	0	1583	3148	0	1504	1670	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			99		19			50				428
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



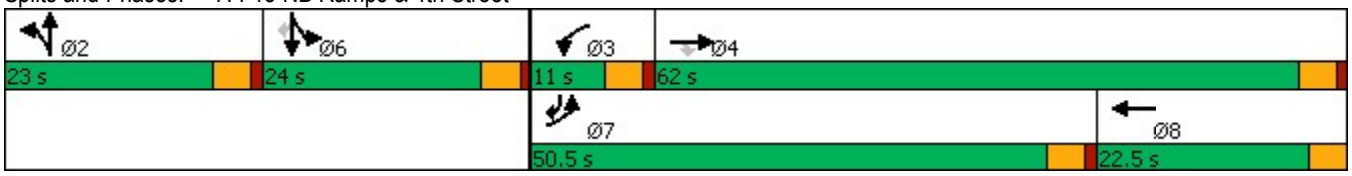
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1014	478	93	32	508	73	95	68	47	71	76	1134
Future Volume (vph)	1014	478	93	32	508	73	95	68	47	71	76	1134
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1079	509	99	34	540	78	101	72	50	76	81	1206
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	1079	509	99	34	618	0	101	122	0	68	89	1206

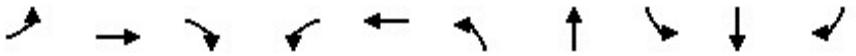
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	1014	478	93	32	508	95	68	71	76	1134
Future Volume (vph)	1014	478	93	32	508	95	68	71	76	1134
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	50.5	62.0	62.0	11.0	22.5	23.0	23.0	24.0	24.0	50.5
Total Split (%)	42.1%	51.7%	51.7%	9.2%	18.8%	19.2%	19.2%	20.0%	20.0%	42.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	44.9	59.8	59.8	6.3	17.6	12.0	12.0	10.9	10.9	60.3
Actuated g/C Ratio	0.44	0.58	0.58	0.06	0.17	0.12	0.12	0.11	0.11	0.59
v/c Ratio	0.85	0.18	0.11	0.35	0.75	0.55	0.30	0.43	0.50	0.70
Control Delay	35.2	11.9	3.3	60.2	46.5	55.8	28.1	53.4	55.2	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	11.9	3.3	60.2	46.5	55.8	28.1	53.4	55.2	11.8
LOS	D	B	A	E	D	E	C	D	E	B
Approach Delay		26.3			47.2		40.6		16.7	
Approach LOS		C			D		D		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 102.5	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 27.3	Intersection LOS: C
Intersection Capacity Utilization 70.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street





Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1079	509	99	34	618	101	122	68	89	1206
v/c Ratio	0.85	0.18	0.11	0.35	0.75	0.55	0.30	0.43	0.50	0.70
Control Delay	35.2	11.9	3.3	60.2	46.5	55.8	28.1	53.4	55.2	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	11.9	3.3	60.2	46.5	55.8	28.1	53.4	55.2	11.8
Queue Length 50th (ft)	326	60	0	22	139	65	23	46	60	193
Queue Length 95th (ft)	#534	98	27	60	203	125	53	97	120	314
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	1312	2826	920	101	901	289	615	289	321	1766
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.18	0.11	0.34	0.69	0.35	0.20	0.24	0.28	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1014	478	93	32	508	73	95	68	47	71	76	1134
Future Volume (veh/h)	1014	478	93	32	508	73	95	68	47	71	76	1134
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	1079	509	99	34	540	78	101	72	50	76	81	1206
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1161	2544	790	48	671	95	139	171	109	296	329	1756
Arrive On Green	0.40	0.53	0.53	0.03	0.16	0.16	0.09	0.09	0.09	0.19	0.19	0.19
Sat Flow, veh/h	2910	4837	1502	1594	4279	608	1594	1973	1256	1594	1772	3003
Grp Volume(v), veh/h	1079	509	99	34	405	213	101	60	62	76	81	1206
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1594	1612	1662	1594	1683	1546	1594	1772	1502
Q Serve(g_s), s	37.2	5.9	3.5	2.2	12.7	13.0	6.5	3.6	4.0	4.3	4.1	19.5
Cycle Q Clear(g_c), s	37.2	5.9	3.5	2.2	12.7	13.0	6.5	3.6	4.0	4.3	4.1	19.5
Prop In Lane	1.00		1.00	1.00		0.37	1.00		0.81	1.00		1.00
Lane Grp Cap(c), veh/h	1161	2544	790	48	506	261	139	146	134	296	329	1756
V/C Ratio(X)	0.93	0.20	0.13	0.71	0.80	0.82	0.73	0.41	0.46	0.26	0.25	0.69
Avail Cap(c_a), veh/h	1275	2650	823	99	584	301	281	297	272	296	329	1756
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.1	13.2	12.6	50.5	42.7	42.8	46.7	45.4	45.6	36.5	36.5	15.1
Incr Delay (d2), s/veh	11.4	0.0	0.1	17.7	6.9	14.2	7.1	1.9	2.4	0.5	0.4	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.4	2.1	1.2	1.1	5.5	6.3	2.8	1.6	1.6	1.7	1.8	9.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.5	13.2	12.7	68.2	49.5	57.0	53.9	47.2	48.0	37.0	36.8	16.3
LnGrp LOS	D	B	B	E	D	E	D	D	D	D	D	B
Approach Vol, veh/h		1687			652			223			1363	
Approach Delay, s/veh		31.3			53.0			50.4			18.6	
Approach LOS		C			D			D			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		13.6	7.6	59.7		24.0	46.4	21.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		18.5	6.5	57.5		19.5	46.0	* 19				
Max Q Clear Time (g_c+I1), s		8.5	4.2	7.9		21.5	39.2	15.0				
Green Ext Time (p_c), s		0.6	0.0	4.3		0.0	2.7	1.5				

Intersection Summary	
HCM 6th Ctrl Delay	31.6
HCM 6th LOS	C

Notes

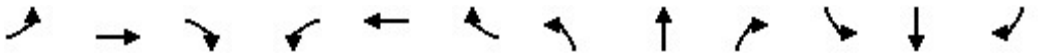
User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

User approved changes to right turn type.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.903				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3028	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3028	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		50				236			236			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



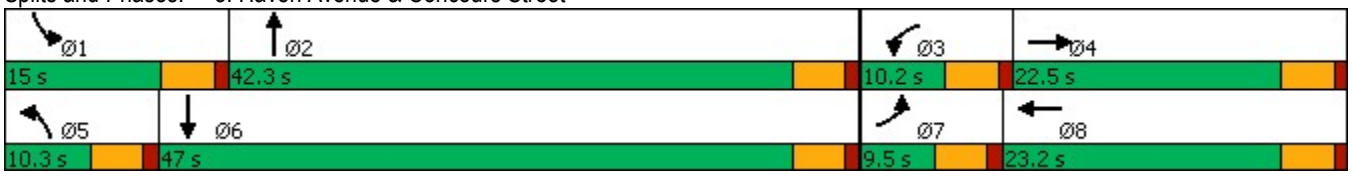
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	12	25	47	126	54	60	45	1585	200	43	1473	31
Future Volume (vph)	12	25	47	126	54	60	45	1585	200	43	1473	31
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	13	27	50	134	57	64	48	1686	213	46	1567	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	77	0	134	57	64	48	1686	213	46	1567	33

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	12	25	126	54	60	45	1585	200	43	1473	31
Future Volume (vph)	12	25	126	54	60	45	1585	200	43	1473	31
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	10.2	23.2		10.3	42.3		15.0	47.0	
Total Split (%)	10.6%	25.0%	11.3%	25.8%		11.4%	47.0%		16.7%	52.2%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.4	6.7	6.1	12.8	64.2	6.2	39.0	64.2	6.9	39.8	64.2
Actuated g/C Ratio	0.08	0.10	0.10	0.20	1.00	0.10	0.61	1.00	0.11	0.62	1.00
v/c Ratio	0.05	0.21	0.36	0.09	0.04	0.17	0.46	0.14	0.15	0.42	0.02
Control Delay	34.8	17.7	35.5	26.7	0.1	34.5	11.0	0.2	32.6	10.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.8	17.7	35.5	26.7	0.1	34.5	11.0	0.2	32.6	10.0	0.0
LOS	C	B	D	C	A	C	B	A	C	A	A
Approach Delay		20.1		24.6			10.4			10.4	
Approach LOS		C		C			B			B	

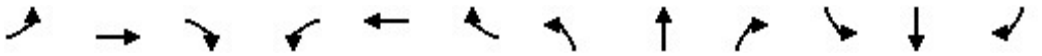
Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 64.2			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.46			
Intersection Signal Delay: 11.6		Intersection LOS: B	
Intersection Capacity Utilization 41.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	13	77	134	57	64	48	1686	213	46	1567	33
v/c Ratio	0.05	0.21	0.36	0.09	0.04	0.17	0.46	0.14	0.15	0.42	0.02
Control Delay	34.8	17.7	35.5	26.7	0.1	34.5	11.0	0.2	32.6	10.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.8	17.7	35.5	26.7	0.1	34.5	11.0	0.2	32.6	10.0	0.0
Queue Length 50th (ft)	3	6	21	11	0	10	143	0	10	126	0
Queue Length 95th (ft)	11	26	42	31	0	28	192	0	26	163	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	242	950	377	1053	1500	281	3892	1500	510	4223	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.08	0.36	0.05	0.04	0.17	0.43	0.14	0.09	0.37	0.02

Intersection Summary



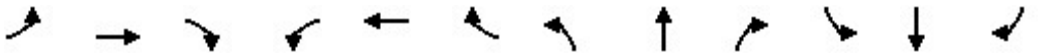
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	25	47	126	54	60	45	1585	200	43	1473	31
Future Volume (veh/h)	12	25	47	126	54	60	45	1585	200	43	1473	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	13	27	50	134	57	0	48	1686	0	46	1567	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	47	133	119	305	470		136	2951		132	2943	
Arrive On Green	0.02	0.08	0.08	0.08	0.14	0.00	0.05	0.48	0.00	0.05	0.48	0.00
Sat Flow, veh/h	2910	1683	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	13	27	50	134	57	0	48	1686	0	46	1567	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	0.3	0.9	1.8	1.8	0.8	0.0	0.9	11.3	0.0	0.9	10.2	0.0
Cycle Q Clear(g_c), s	0.3	0.9	1.8	1.8	0.8	0.0	0.9	11.3	0.0	0.9	10.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	47	133	119	305	470		136	2951		132	2943	
V/C Ratio(X)	0.27	0.20	0.42	0.44	0.12		0.35	0.57		0.35	0.53	
Avail Cap(c_a), veh/h	254	530	472	395	1100		295	4027		534	4528	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.8	24.7	25.1	25.2	21.5	0.0	26.4	10.5	0.0	26.5	10.3	0.0
Incr Delay (d2), s/veh	3.1	0.7	2.4	1.0	0.1	0.0	1.6	0.2	0.0	1.6	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.3	0.7	0.6	0.3	0.0	0.3	3.1	0.0	0.3	2.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.9	25.4	27.5	26.2	21.7	0.0	28.0	10.7	0.0	28.1	10.5	0.0
LnGrp LOS	C	C	C	C	C		C	B		C	B	
Approach Vol, veh/h		90			191	A		1734	A		1613	A
Approach Delay, s/veh		27.3			24.9			11.2			11.0	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	32.2	8.9	9.0	7.2	32.1	5.4	12.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	37.8	5.7	18.0	5.8	42.5	5.0	18.7
Max Q Clear Time (g_c+I1), s	2.9	13.3	3.8	3.8	2.9	12.2	2.3	2.8
Green Ext Time (p_c), s	0.0	14.4	0.1	0.3	0.0	14.9	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	12.2
HCM 6th LOS	B

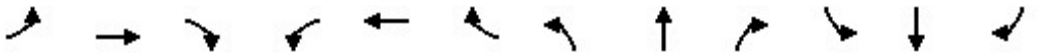
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.936									0.990	
Flt Protected	0.950	0.972					0.950					
Satd. Flow (prot)	1593	1525	0	0	1765	0	1676	4818	0	1765	4769	0
Flt Permitted	0.950	0.972					0.950					
Satd. Flow (perm)	1593	1525	0	0	1765	0	1676	4818	0	1765	4769	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		143									13	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



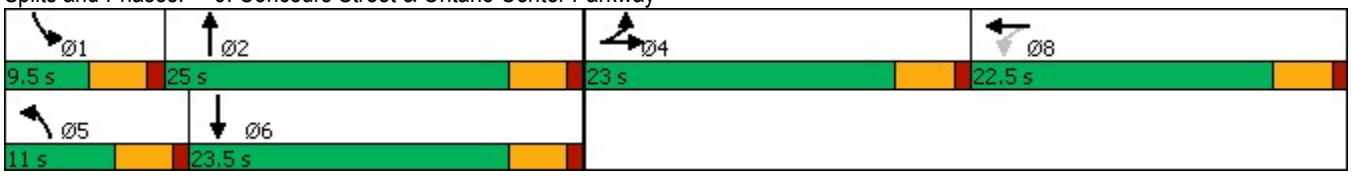
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	11	0	3	0	0	0	5	303	1	0	226	16
Future Volume (vph)	11	0	3	0	0	0	5	303	1	0	226	16
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	12	0	3	0	0	0	6	337	1	0	251	18
Shared Lane Traffic (%)	36%											
Lane Group Flow (vph)	8	7	0	0	0	0	6	338	0	0	269	0

Intersection Summary

Lane Group	EBL	EBT	NBL	NBT	SBT	Ø1	Ø8
Lane Configurations							
Traffic Volume (vph)	11	0	5	303	226		
Future Volume (vph)	11	0	5	303	226		
Turn Type	Split	NA	Prot	NA	NA		
Protected Phases	4	4	5	2	6	1	8
Permitted Phases							
Detector Phase	4	4	5	2	6		
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	9.5	22.5
Total Split (s)	23.0	23.0	11.0	25.0	23.5	9.5	22.5
Total Split (%)	28.8%	28.8%	13.8%	31.3%	29.4%	12%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		
Lead/Lag			Lead	Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	Min	Min	None	None
Act Effct Green (s)	6.0	6.0	5.9	27.2	25.7		
Actuated g/C Ratio	0.21	0.21	0.20	0.93	0.88		
v/c Ratio	0.02	0.02	0.02	0.08	0.06		
Control Delay	13.0	0.0	13.0	1.0	2.9		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	13.0	0.0	13.0	1.0	2.9		
LOS	B	A	B	A	A		
Approach Delay		6.9		1.2	2.9		
Approach LOS		A		A	A		

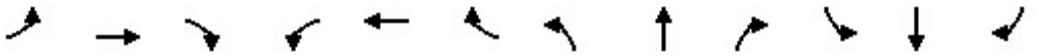
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 29.2	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.08	
Intersection Signal Delay: 2.1	Intersection LOS: A
Intersection Capacity Utilization 17.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	NBL	NBT	SBT
Lane Group Flow (vph)	8	7	6	338	269
v/c Ratio	0.02	0.02	0.02	0.08	0.06
Control Delay	13.0	0.0	13.0	1.0	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	0.0	13.0	1.0	2.9
Queue Length 50th (ft)	1	0	1	0	0
Queue Length 95th (ft)	10	0	9	14	25
Internal Link Dist (ft)		319		111	176
Turn Bay Length (ft)	170		115		
Base Capacity (vph)	1058	1061	391	4482	4229
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.01	0.02	0.08	0.06

Intersection Summary



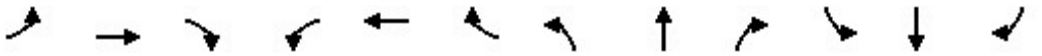
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	0	3	0	0	0	5	303	1	0	226	16
Future Volume (veh/h)	11	0	3	0	0	0	5	303	1	0	226	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	8	6	3	0	0	0	6	337	1	0	251	18
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	38	25	13	0	9	0	14	2519	7	9	1208	85
Arrive On Green	0.02	0.02	0.02	0.00	0.00	0.00	0.01	0.51	0.51	0.00	0.26	0.26
Sat Flow, veh/h	1688	1114	557	0	1772	0	1688	4979	15	1688	4613	326
Grp Volume(v), veh/h	8	0	9	0	0	0	6	218	120	0	174	95
Grp Sat Flow(s),veh/h/ln	1688	0	1672	0	1772	0	1688	1612	1769	1688	1612	1713
Q Serve(g_s), s	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.7	0.7	0.0	0.8	0.8
Cycle Q Clear(g_c), s	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.7	0.7	0.0	0.8	0.8
Prop In Lane	1.00		0.33	0.00		0.00	1.00		0.01	1.00		0.19
Lane Grp Cap(c), veh/h	38	0	38	0	9	0	14	1632	895	9	845	449
V/C Ratio(X)	0.21	0.00	0.24	0.00	0.00	0.00	0.43	0.13	0.13	0.00	0.21	0.21
Avail Cap(c_a), veh/h	1636	0	1620	0	1671	0	575	3464	1900	442	3210	1705
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	9.2	0.0	9.2	0.0	0.0	0.0	9.4	2.5	2.5	0.0	5.5	5.5
Incr Delay (d2), s/veh	2.7	0.0	3.2	0.0	0.0	0.0	19.9	0.0	0.1	0.0	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.9	0.0	12.4	0.0	0.0	0.0	29.4	2.5	2.6	0.0	5.6	5.7
LnGrp LOS	B	A	B	A	A	A	C	A	A	A	A	A
Approach Vol, veh/h		17			0			344			269	
Approach Delay, s/veh		12.1			0.0			3.0			5.7	
Approach LOS		B						A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	14.2		4.9	4.7	9.5		0.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	20.5		18.5	6.5	19.0		18.0				
Max Q Clear Time (g_c+I1), s	0.0	2.7		2.1	2.1	2.8		0.0				
Green Ext Time (p_c), s	0.0	1.9		0.0	0.0	1.4		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	4.4
HCM 6th LOS	A

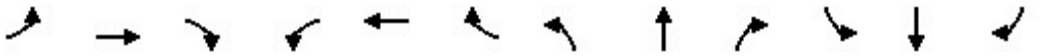
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			194			182			213			238
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



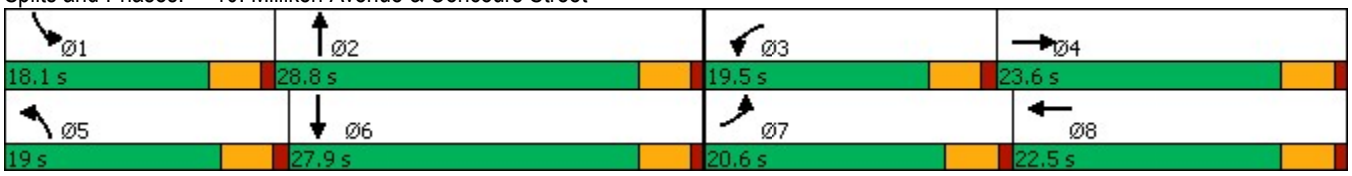
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	302	156	180	261	102	161	223	1000	243	281	1004	235
Future Volume (vph)	302	156	180	261	102	161	223	1000	243	281	1004	235
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	325	168	194	281	110	173	240	1075	261	302	1080	253
Shared Lane Traffic (%)												
Lane Group Flow (vph)	325	168	194	281	110	173	240	1075	261	302	1080	253

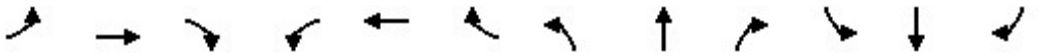
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	302	156	180	261	102	161	223	1000	243	281	1004	235
Future Volume (vph)	302	156	180	261	102	161	223	1000	243	281	1004	235
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	20.6	23.6		19.5	22.5		19.0	28.8		18.1	27.9	
Total Split (%)	22.9%	26.2%		21.7%	25.0%		21.1%	32.0%		20.1%	31.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	15.9	9.2	73.1	12.2	8.2	73.1	11.3	21.3	73.1	12.1	22.0	73.1
Actuated g/C Ratio	0.22	0.13	1.00	0.17	0.11	1.00	0.15	0.29	1.00	0.17	0.30	1.00
v/c Ratio	0.52	0.40	0.13	0.58	0.29	0.12	0.54	0.61	0.17	0.63	0.59	0.17
Control Delay	31.2	34.0	0.2	34.6	34.1	0.2	34.5	24.5	0.3	36.4	23.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.2	34.0	0.2	34.6	34.1	0.2	34.5	24.5	0.3	36.4	23.9	0.2
LOS	C	C	A	C	C	A	C	C	A	D	C	A
Approach Delay		23.1			23.9			22.0			22.5	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 73.1	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 22.6	Intersection LOS: C
Intersection Capacity Utilization 54.2%	ICU Level of Service A
Analysis Period (min) 15	

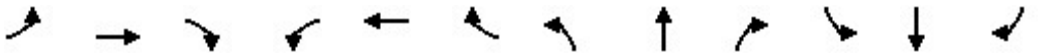
Splits and Phases: 10: Milliken Avenue & Concours Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	325	168	194	281	110	173	240	1075	261	302	1080	253
v/c Ratio	0.52	0.40	0.13	0.58	0.29	0.12	0.54	0.61	0.17	0.63	0.59	0.17
Control Delay	31.2	34.0	0.2	34.6	34.1	0.2	34.5	24.5	0.3	36.4	23.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.2	34.0	0.2	34.6	34.1	0.2	34.5	24.5	0.3	36.4	23.9	0.2
Queue Length 50th (ft)	73	39	0	63	25	0	54	125	0	68	121	0
Queue Length 95th (ft)	121	72	0	108	52	0	93	173	0	118	177	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	682	892	1500	604	841	1500	584	2055	1500	547	2016	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.19	0.13	0.47	0.13	0.12	0.41	0.52	0.17	0.55	0.54	0.17

Intersection Summary



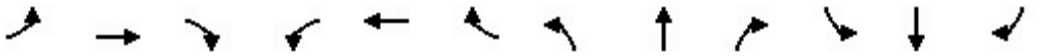
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	302	156	180	261	102	161	223	1000	243	281	1004	235
Future Volume (veh/h)	302	156	180	261	102	161	223	1000	243	281	1004	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	325	168	0	281	110	0	240	1075	0	302	1080	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	447	355		397	297		350	1816		416	1954	
Arrive On Green	0.15	0.11	0.00	0.14	0.09	0.00	0.12	0.30	0.00	0.14	0.32	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	325	168	0	281	110	0	240	1075	0	302	1080	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	6.0	2.7	0.0	5.2	1.7	0.0	4.5	8.5	0.0	5.6	8.3	0.0
Cycle Q Clear(g_c), s	6.0	2.7	0.0	5.2	1.7	0.0	4.5	8.5	0.0	5.6	8.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	447	355		397	297		350	1816		416	1954	
V/C Ratio(X)	0.73	0.47		0.71	0.37		0.69	0.59		0.73	0.55	
Avail Cap(c_a), veh/h	826	1134		770	1069		744	2612		698	2515	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.9	23.9	0.0	23.4	24.4	0.0	23.9	17.0	0.0	23.2	15.9	0.0
Incr Delay (d2), s/veh	2.3	1.0	0.0	2.3	0.8	0.0	2.4	0.3	0.0	2.4	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	1.0	0.0	1.8	0.7	0.0	1.5	2.7	0.0	1.9	2.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.1	24.9	0.0	25.7	25.1	0.0	26.3	17.3	0.0	25.7	16.2	0.0
LnGrp LOS	C	C		C	C		C	B		C	B	
Approach Vol, veh/h		493	A		391	A		1315	A		1382	A
Approach Delay, s/veh		25.0			25.6			18.9			18.2	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.6	21.4	12.2	10.5	11.3	22.7	13.2	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.6	24.3	15.0	19.1	14.5	23.4	16.1	18.0
Max Q Clear Time (g_c+I1), s	7.6	10.5	7.2	4.7	6.5	10.3	8.0	3.7
Green Ext Time (p_c), s	0.5	6.4	0.6	0.8	0.5	6.2	0.7	0.4

Intersection Summary	
HCM 6th Ctrl Delay	20.2
HCM 6th LOS	C

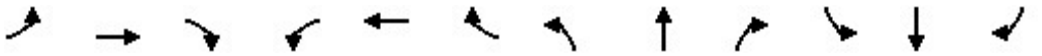
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			182			473			182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



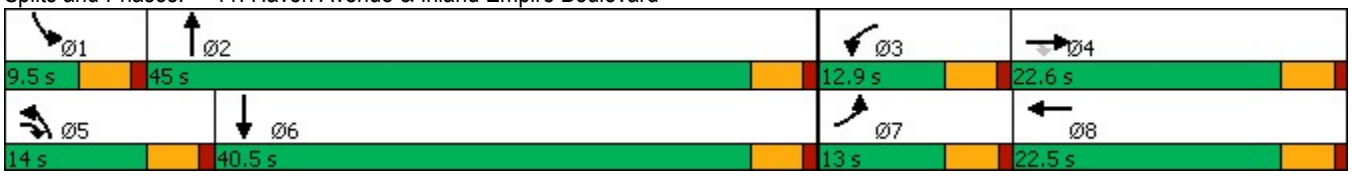
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	72	126	262	189	124	71	170	1691	570	55	1485	47
Future Volume (vph)	72	126	262	189	124	71	170	1691	570	55	1485	47
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	74	130	270	195	128	73	175	1743	588	57	1531	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	74	130	270	195	128	73	175	1743	588	57	1531	48

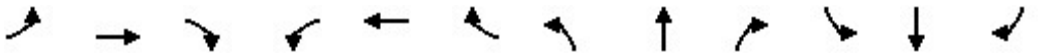
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	126	262	189	124	71	170	1691	570	55	1485	47
Future Volume (vph)	72	126	262	189	124	71	170	1691	570	55	1485	47
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	13.0	22.6	14.0	12.9	22.5		14.0	45.0		9.5	40.5	
Total Split (%)	14.4%	25.1%	15.6%	14.3%	25.0%		15.6%	50.0%		10.6%	45.0%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	7.3	8.5	19.0	8.2	9.2	73.2	8.9	40.5	73.2	5.2	32.1	73.2
Actuated g/C Ratio	0.10	0.12	0.26	0.11	0.13	1.00	0.12	0.55	1.00	0.07	0.44	1.00
v/c Ratio	0.26	0.33	0.61	0.44	0.30	0.05	0.50	0.52	0.39	0.28	0.58	0.03
Control Delay	36.1	35.1	23.8	36.7	34.2	0.1	38.2	12.6	0.8	40.0	17.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.1	35.1	23.8	36.7	34.2	0.1	38.2	12.6	0.8	40.0	17.1	0.0
LOS	D	D	C	D	C	A	D	B	A	D	B	A
Approach Delay		28.8			29.2			11.6			17.4	
Approach LOS		C			C			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 73.2	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 16.5	Intersection LOS: B
Intersection Capacity Utilization 55.6%	ICU Level of Service B
Analysis Period (min) 15	

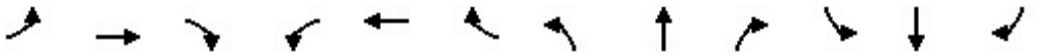
Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	74	130	270	195	128	73	175	1743	588	57	1531	48
v/c Ratio	0.26	0.33	0.61	0.44	0.30	0.05	0.50	0.52	0.39	0.28	0.58	0.03
Control Delay	36.1	35.1	23.8	36.7	34.2	0.1	38.2	12.6	0.8	40.0	17.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.1	35.1	23.8	36.7	34.2	0.1	38.2	12.6	0.8	40.0	17.1	0.0
Queue Length 50th (ft)	18	32	83	33	31	0	43	167	0	14	158	0
Queue Length 95th (ft)	38	59	159	57	58	0	76	213	0	33	203	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	348	859	460	468	854	1500	389	3516	1500	204	3095	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.15	0.59	0.42	0.15	0.05	0.45	0.50	0.39	0.28	0.49	0.03

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	126	262	189	124	71	170	1691	570	55	1485	47
Future Volume (veh/h)	72	126	262	189	124	71	170	1691	570	55	1485	47
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	74	130	270	195	128	0	175	1743	0	57	1531	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	154	656	421	301	733		248	2678		136	2442	
Arrive On Green	0.05	0.19	0.19	0.08	0.22	0.00	0.09	0.44	0.00	0.05	0.40	0.00
Sat Flow, veh/h	2910	3367	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	74	130	270	195	128	0	175	1743	0	57	1531	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	1.8	2.4	11.7	3.5	2.3	0.0	4.3	16.6	0.0	1.4	14.9	0.0
Cycle Q Clear(g_c), s	1.8	2.4	11.7	3.5	2.3	0.0	4.3	16.6	0.0	1.4	14.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	154	656	421	301	733		248	2678		136	2442	
V/C Ratio(X)	0.48	0.20	0.64	0.65	0.17		0.71	0.65		0.42	0.63	
Avail Cap(c_a), veh/h	335	824	496	451	820		374	3339		197	2968	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.0	24.9	23.4	33.2	23.5	0.0	32.9	16.3	0.0	34.3	17.7	0.0
Incr Delay (d2), s/veh	2.3	0.1	2.2	2.4	0.1	0.0	3.6	0.3	0.0	2.1	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.9	4.2	1.2	0.9	0.0	1.6	5.3	0.0	0.5	4.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.4	25.1	25.5	35.6	23.6	0.0	36.6	16.6	0.0	36.3	18.0	0.0
LnGrp LOS	D	C	C	D	C		D	B		D	B	
Approach Vol, veh/h		474			323	A		1918	A		1588	A
Approach Delay, s/veh		27.1			30.8			18.4			18.7	
Approach LOS		C			C			B			B	

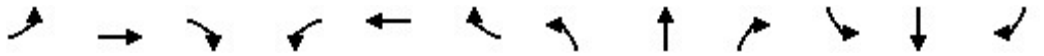
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.9	37.0	10.1	18.9	10.8	34.1	8.4	20.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	40.5	8.4	18.1	9.5	36.0	8.5	18.0
Max Q Clear Time (g_c+I1), s	3.4	18.6	5.5	13.7	6.3	16.9	3.8	4.3
Green Ext Time (p_c), s	0.0	13.9	0.2	0.7	0.2	11.1	0.1	0.5

Intersection Summary	
HCM 6th Ctrl Delay	20.4
HCM 6th LOS	C

Notes

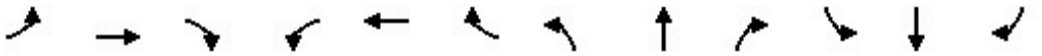
User approved changes to right turn type.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			281			193			596			193
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



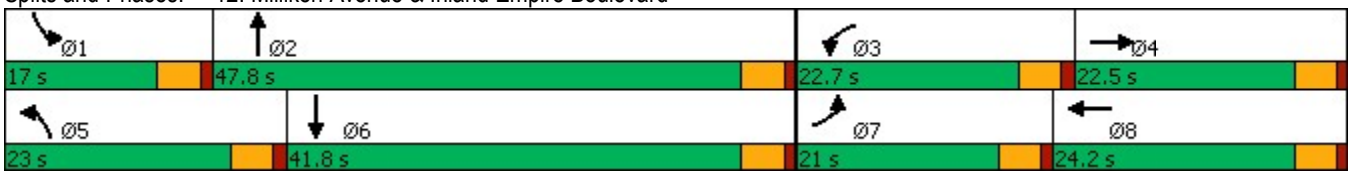
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	179	298	273	360	139	136	349	1112	794	143	1331	112
Future Volume (vph)	179	298	273	360	139	136	349	1112	794	143	1331	112
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	185	307	281	371	143	140	360	1146	819	147	1372	115
Shared Lane Traffic (%)												
Lane Group Flow (vph)	185	307	281	371	143	140	360	1146	819	147	1372	115

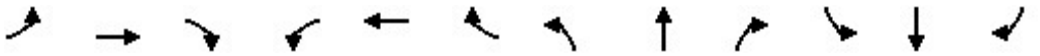
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	179	298	273	360	139	136	349	1112	794	143	1331	112
Future Volume (vph)	179	298	273	360	139	136	349	1112	794	143	1331	112
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	21.0	22.5		22.7	24.2		23.0	47.8		17.0	41.8	
Total Split (%)	19.1%	20.5%		20.6%	22.0%		20.9%	43.5%		15.5%	38.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	11.8	14.3	98.8	16.5	19.0	98.8	16.4	39.5	98.8	10.2	33.2	98.8
Actuated g/C Ratio	0.12	0.14	1.00	0.17	0.19	1.00	0.17	0.40	1.00	0.10	0.34	1.00
v/c Ratio	0.54	0.63	0.19	0.77	0.22	0.09	0.75	0.47	0.55	0.49	0.67	0.08
Control Delay	48.7	47.5	0.3	52.5	36.8	0.1	51.3	23.2	1.4	50.1	30.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.7	47.5	0.3	52.5	36.8	0.1	51.3	23.2	1.4	50.1	30.5	0.1
LOS	D	D	A	D	D	A	D	C	A	D	C	A
Approach Delay		30.6			37.9			19.9			30.1	
Approach LOS		C			D			B			C	

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 98.8	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 26.7	Intersection LOS: C
Intersection Capacity Utilization 68.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	185	307	281	371	143	140	360	1146	819	147	1372	115
v/c Ratio	0.54	0.63	0.19	0.77	0.22	0.09	0.75	0.47	0.55	0.49	0.67	0.08
Control Delay	48.7	47.5	0.3	52.5	36.8	0.1	51.3	23.2	1.4	50.1	30.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.7	47.5	0.3	52.5	36.8	0.1	51.3	23.2	1.4	50.1	30.5	0.1
Queue Length 50th (ft)	62	105	0	124	43	0	120	159	0	49	228	0
Queue Length 95th (ft)	98	153	0	#195	75	0	178	206	0	84	280	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	492	622	1500	543	703	1500	551	2728	1500	373	2337	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.49	0.19	0.68	0.20	0.09	0.65	0.42	0.55	0.39	0.59	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	298	273	360	139	136	349	1112	794	143	1331	112
Future Volume (veh/h)	179	298	273	360	139	136	349	1112	794	143	1331	112
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	185	307	0	371	143	0	360	1146	0	147	1372	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	261	429		456	654		446	2562		215	2077	
Arrive On Green	0.09	0.13	0.00	0.16	0.19	0.00	0.15	0.42	0.00	0.07	0.34	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	185	307	0	371	143	0	360	1146	0	147	1372	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	5.0	7.1	0.0	10.0	2.9	0.0	9.7	10.9	0.0	4.0	15.5	0.0
Cycle Q Clear(g_c), s	5.0	7.1	0.0	10.0	2.9	0.0	9.7	10.9	0.0	4.0	15.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	261	429		456	654		446	2562		215	2077	
V/C Ratio(X)	0.71	0.72		0.81	0.22		0.81	0.45		0.68	0.66	
Avail Cap(c_a), veh/h	592	747		653	817		663	3252		448	2801	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.9	34.0	0.0	33.1	27.5	0.0	33.2	16.8	0.0	36.7	22.8	0.0
Incr Delay (d2), s/veh	3.5	2.2	0.0	5.2	0.2	0.0	4.5	0.1	0.0	3.8	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	3.0	0.0	3.8	1.2	0.0	3.6	3.6	0.0	1.5	5.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.4	36.3	0.0	38.3	27.7	0.0	37.7	16.9	0.0	40.5	23.1	0.0
LnGrp LOS	D	D		D	C		D	B		D	C	
Approach Vol, veh/h		492	A		514	A		1506	A		1519	A
Approach Delay, s/veh		37.4			35.3			21.9			24.8	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	38.6	17.2	14.8	16.9	32.2	11.8	20.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	43.3	18.2	18.0	18.5	37.3	16.5	19.7
Max Q Clear Time (g_c+I1), s	6.0	12.9	12.0	9.1	11.7	17.5	7.0	4.9
Green Ext Time (p_c), s	0.2	9.9	0.7	1.2	0.7	10.1	0.4	0.6

Intersection Summary	
HCM 6th Ctrl Delay	26.6
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.925	0.850				
Flt Protected	0.976					
Satd. Flow (prot)	2919	1365	6071	0	0	6071
Flt Permitted	0.976					
Satd. Flow (perm)	2919	1365	6071	0	0	6071
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	6	6				
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

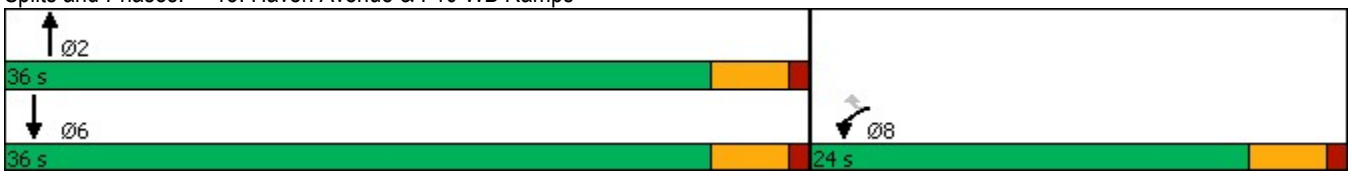
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	242	484	1908	0	0	1297
Future Volume (vph)	242	484	1908	0	0	1297
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.98	0.98	0.98	0.92	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	247	494	1947	0	0	1323
Shared Lane Traffic (%)		50%				
Lane Group Flow (vph)	494	247	1947	0	0	1323

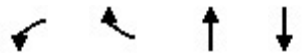
Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	242	484	1908	1297
Future Volume (vph)	242	484	1908	1297
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	36.0	36.0
Total Split (%)	40.0%	40.0%	60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	14.9	14.9	30.2	30.2
Actuated g/C Ratio	0.27	0.27	0.56	0.56
v/c Ratio	0.61	0.65	0.58	0.39
Control Delay	20.6	26.1	9.2	7.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.6	26.1	9.2	7.7
LOS	C	C	A	A
Approach Delay	22.4		9.2	7.7
Approach LOS	C		A	A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 54.3	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 11.1	Intersection LOS: B
Intersection Capacity Utilization 68.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps





Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	494	247	1947	1323
v/c Ratio	0.61	0.65	0.58	0.39
Control Delay	20.6	26.1	9.2	7.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.6	26.1	9.2	7.7
Queue Length 50th (ft)	72	76	108	63
Queue Length 95th (ft)	112	147	163	99
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	1068	501	3577	3577
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.46	0.49	0.54	0.37

Intersection Summary

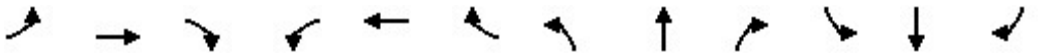
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	242	484	1908	0	0	1297
Future Volume (veh/h)	242	484	1908	0	0	1297
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1673	1772	1772	0	0	1772
Adj Flow Rate, veh/h	247	494	1947	0	0	1323
Peak Hour Factor	0.98	0.98	0.98	0.92	0.98	0.98
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	385	726	3431	0	0	3431
Arrive On Green	0.24	0.24	0.56	0.00	0.00	0.56
Sat Flow, veh/h	1594	3003	6592	0	0	6592
Grp Volume(v), veh/h	247	494	1947	0	0	1323
Grp Sat Flow(s),veh/h/ln	1594	1502	1524	0	0	1524
Q Serve(g_s), s	6.4	6.9	9.4	0.0	0.0	5.6
Cycle Q Clear(g_c), s	6.4	6.9	9.4	0.0	0.0	5.6
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	385	726	3431	0	0	3431
V/C Ratio(X)	0.64	0.68	0.57	0.00	0.00	0.39
Avail Cap(c_a), veh/h	675	1272	4169	0	0	4169
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	15.7	15.9	6.5	0.0	0.0	5.6
Incr Delay (d2), s/veh	1.8	1.1	0.1	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	2.1	2.0	0.0	0.0	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.5	17.0	6.6	0.0	0.0	5.7
LnGrp LOS	B	B	A	A	A	A
Approach Vol, veh/h	741		1947			1323
Approach Delay, s/veh	17.1		6.6			5.7
Approach LOS	B		A			A

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	30.4			30.4	15.6
Change Period (Y+Rc), s	4.5			4.5	4.5
Max Green Setting (Gmax), s	31.5			31.5	19.5
Max Q Clear Time (g_c+I1), s	11.4			7.6	8.9
Green Ext Time (p_c), s	14.5			10.8	2.3

Intersection Summary	
HCM 6th Ctrl Delay	8.3
HCM 6th LOS	A

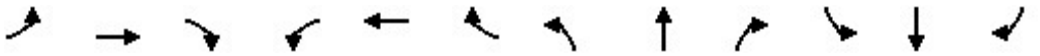
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			136			218			55
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



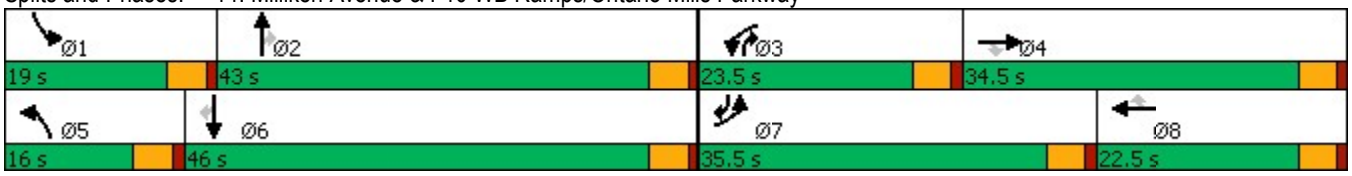
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	619	229	130	277	345	103	210	1354	420	305	1003	798
Future Volume (vph)	619	229	130	277	345	103	210	1354	420	305	1003	798
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	666	246	140	298	371	111	226	1456	452	328	1078	858
Shared Lane Traffic (%)												
Lane Group Flow (vph)	666	246	140	298	371	111	226	1456	452	328	1078	858

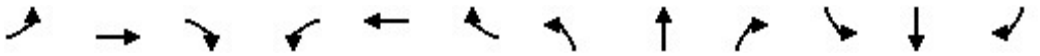
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	619	229	130	277	345	103	210	1354	420	305	1003	798
Future Volume (vph)	619	229	130	277	345	103	210	1354	420	305	1003	798
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	35.5	34.5	34.5	23.5	22.5	22.5	16.0	43.0	23.5	19.0	46.0	35.5
Total Split (%)	29.6%	28.8%	28.8%	19.6%	18.8%	18.8%	13.3%	35.8%	19.6%	15.8%	38.3%	29.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	29.9	29.8	29.8	16.6	16.6	16.6	11.3	36.8	58.0	14.6	40.1	74.5
Actuated g/C Ratio	0.26	0.26	0.26	0.14	0.14	0.14	0.10	0.32	0.50	0.13	0.35	0.64
v/c Ratio	0.90	0.54	0.31	0.72	0.78	0.34	0.80	0.76	0.53	0.90	0.51	0.87
Control Delay	57.9	43.3	15.4	58.3	60.3	7.2	73.5	38.7	11.8	79.5	31.4	27.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.9	43.3	15.4	58.3	60.3	7.2	73.5	38.7	11.8	79.5	31.4	27.7
LOS	E	D	B	E	E	A	E	D	B	E	C	C
Approach Delay		48.8			52.0			36.7			37.0	
Approach LOS		D			D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 115.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 40.7	Intersection LOS: D
Intersection Capacity Utilization 80.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	666	246	140	298	371	111	226	1456	452	328	1078	858
v/c Ratio	0.90	0.54	0.31	0.72	0.78	0.34	0.80	0.76	0.53	0.90	0.51	0.87
Control Delay	57.9	43.3	15.4	58.3	60.3	7.2	73.5	38.7	11.8	79.5	31.4	27.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.9	43.3	15.4	58.3	60.3	7.2	73.5	38.7	11.8	79.5	31.4	27.7
Queue Length 50th (ft)	257	166	27	113	146	0	90	292	109	131	191	477
Queue Length 95th (ft)	#361	253	82	161	201	34	#155	336	199	#222	227	#821
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	776	466	466	476	522	348	288	2025	886	363	2183	999
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.53	0.30	0.63	0.71	0.32	0.78	0.72	0.51	0.90	0.49	0.86

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	619	229	130	277	345	103	210	1354	420	305	1003	798
Future Volume (veh/h)	619	229	130	277	345	103	210	1354	420	305	1003	798
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	666	246	140	298	371	111	226	1456	452	328	1078	858
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	725	462	391	356	450	201	275	2021	681	371	2223	922
Arrive On Green	0.25	0.26	0.26	0.12	0.13	0.13	0.09	0.33	0.33	0.13	0.36	0.36
Sat Flow, veh/h	2910	1772	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	666	246	140	298	371	111	226	1456	452	328	1078	858
Grp Sat Flow(s),veh/h/ln	1455	1772	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	25.4	13.6	8.7	11.4	12.2	7.9	8.7	23.9	26.8	12.6	15.5	41.5
Cycle Q Clear(g_c), s	25.4	13.6	8.7	11.4	12.2	7.9	8.7	23.9	26.8	12.6	15.5	41.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	725	462	391	356	450	201	275	2021	681	371	2223	922
V/C Ratio(X)	0.92	0.53	0.36	0.84	0.82	0.55	0.82	0.72	0.66	0.88	0.48	0.93
Avail Cap(c_a), veh/h	793	467	396	486	533	238	294	2062	692	371	2223	922
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.6	36.1	34.3	48.8	48.0	46.1	50.6	33.4	24.3	48.8	27.9	19.8
Incr Delay (d2), s/veh	14.9	1.1	0.6	9.2	8.9	2.4	16.2	1.2	2.3	21.5	0.2	15.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.5	6.0	3.2	4.6	5.7	3.1	3.8	8.9	9.7	5.7	5.7	22.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.5	37.3	34.9	58.0	56.9	48.5	66.8	34.6	26.6	70.4	28.1	35.4
LnGrp LOS	E	D	C	E	E	D	E	C	C	E	C	D
Approach Vol, veh/h		1052			780			2134			2264	
Approach Delay, s/veh		49.1			56.1			36.3			37.0	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	42.2	18.4	34.2	15.2	46.0	32.9	19.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	38.5	19.0	30.0	11.5	41.5	31.0	18.0
Max Q Clear Time (g_c+I1), s	14.6	28.8	13.4	15.6	10.7	43.5	27.4	14.2
Green Ext Time (p_c), s	0.0	7.3	0.5	1.6	0.1	0.0	1.0	1.0

Intersection Summary	
HCM 6th Ctrl Delay	41.2
HCM 6th LOS	D

Notes

User approved changes to right turn type.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.992	0.850				
Flt Protected	0.955					
Satd. Flow (prot)	3063	1365	0	6071	6071	0
Flt Permitted	0.955					
Satd. Flow (perm)	3063	1365	0	6071	6071	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	9	9				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

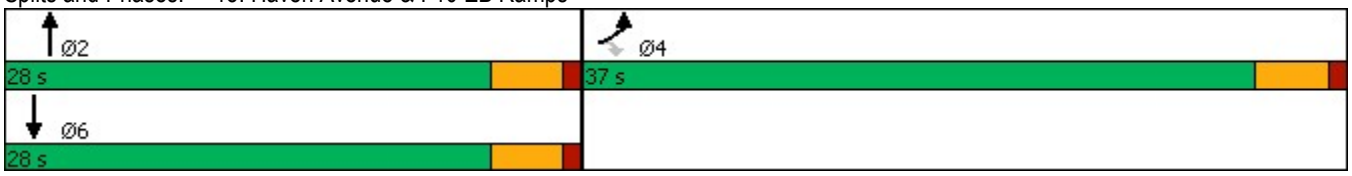
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	1000	537	0	1485	1217	0
Future Volume (vph)	1000	537	0	1485	1217	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1031	554	0	1531	1255	0
Shared Lane Traffic (%)		11%				
Lane Group Flow (vph)	1092	493	0	1531	1255	0

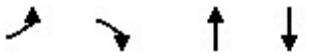
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1000	537	1485	1217
Future Volume (vph)	1000	537	1485	1217
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	37.0	37.0	28.0	28.0
Total Split (%)	56.9%	56.9%	43.1%	43.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	27.4	27.4	22.7	22.7
Actuated g/C Ratio	0.46	0.46	0.38	0.38
v/c Ratio	0.77	0.78	0.66	0.54
Control Delay	17.3	23.0	17.4	15.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	17.3	23.0	17.4	15.9
LOS	B	C	B	B
Approach Delay	19.1		17.4	15.9
Approach LOS	B		B	B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 59.2	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 17.6	Intersection LOS: B
Intersection Capacity Utilization 68.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1092	493	1531	1255
v/c Ratio	0.77	0.78	0.66	0.54
Control Delay	17.3	23.0	17.4	15.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	17.3	23.0	17.4	15.9
Queue Length 50th (ft)	159	152	137	106
Queue Length 95th (ft)	226	#279	184	145
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	1714	766	2450	2450
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.64	0.64	0.62	0.51

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1000	537	0	1485	1217	0
Future Volume (veh/h)	1000	537	0	1485	1217	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1772	0	1772	1772	0
Adj Flow Rate, veh/h	1055	528	0	1531	1255	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	1431	674	0	2324	2324	0
Arrive On Green	0.45	0.45	0.00	0.38	0.38	0.00
Sat Flow, veh/h	3188	1502	0	6592	6592	0
Grp Volume(v), veh/h	1055	528	0	1531	1255	0
Grp Sat Flow(s),veh/h/ln	1594	1502	0	1524	1524	0
Q Serve(g_s), s	14.5	15.9	0.0	11.0	8.5	0.0
Cycle Q Clear(g_c), s	14.5	15.9	0.0	11.0	8.5	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	1431	674	0	2324	2324	0
V/C Ratio(X)	0.74	0.78	0.00	0.66	0.54	0.00
Avail Cap(c_a), veh/h	1953	920	0	2700	2700	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.0	12.4	0.0	13.6	12.8	0.0
Incr Delay (d2), s/veh	1.0	3.1	0.0	0.5	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	4.8	0.0	3.3	2.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.0	15.5	0.0	14.0	13.0	0.0
LnGrp LOS	B	B	A	B	B	A
Approach Vol, veh/h	1583			1531	1255	
Approach Delay, s/veh	13.8			14.0	13.0	
Approach LOS	B			B	B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		24.7		28.3		24.7
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		23.5		32.5		23.5
Max Q Clear Time (g_c+I1), s		13.0		17.9		10.5
Green Ext Time (p_c), s		7.2		6.0		7.1

Intersection Summary	
HCM 6th Ctrl Delay	13.7
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1600	1800	1600	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2891	1500	2891	6071	6071	1500
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2891	1500	2891	6071	6071	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		12				127
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	887	222	158	1147	836	599
Future Volume (vph)	887	222	158	1147	836	599
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	914	229	163	1182	862	618
Shared Lane Traffic (%)						
Lane Group Flow (vph)	914	229	163	1182	862	618

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	887	222	158	1147	836	599
Future Volume (vph)	887	222	158	1147	836	599
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	39.0	12.0	12.0	36.0	24.0	39.0
Total Split (%)	52.0%	16.0%	16.0%	48.0%	32.0%	52.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	27.4	39.4	7.4	28.2	16.2	48.2
Actuated g/C Ratio	0.42	0.61	0.11	0.44	0.25	0.74
v/c Ratio	0.75	0.25	0.50	0.45	0.57	0.54
Control Delay	20.4	6.6	35.5	14.2	23.6	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.4	6.6	35.5	14.2	23.6	4.4
LOS	C	A	D	B	C	A
Approach Delay	17.6			16.8	15.6	
Approach LOS	B			B	B	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 64.8	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 59.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	914	229	163	1182	862	618
v/c Ratio	0.75	0.25	0.50	0.45	0.57	0.54
Control Delay	20.4	6.6	35.5	14.2	23.6	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.4	6.6	35.5	14.2	23.6	4.4
Queue Length 50th (ft)	154	36	32	93	88	53
Queue Length 95th (ft)	230	71	67	140	130	97
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	1580	923	343	3030	1875	1309
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.25	0.48	0.39	0.46	0.47

Intersection Summary

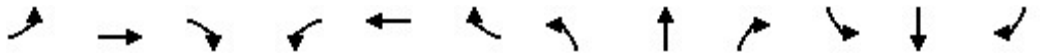
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	887	222	158	1147	836	599
Future Volume (veh/h)	887	222	158	1147	836	599
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1772	1575	1772	1772	1772
Adj Flow Rate, veh/h	914	229	163	1182	862	618
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1123	705	243	2821	1850	1035
Arrive On Green	0.39	0.39	0.08	0.46	0.30	0.30
Sat Flow, veh/h	2910	1502	2910	6343	6343	1502
Grp Volume(v), veh/h	914	229	163	1182	862	618
Grp Sat Flow(s),veh/h/ln	1455	1502	1455	1524	1524	1502
Q Serve(g_s), s	16.7	5.7	3.2	7.7	6.8	12.9
Cycle Q Clear(g_c), s	16.7	5.7	3.2	7.7	6.8	12.9
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1123	705	243	2821	1850	1035
V/C Ratio(X)	0.81	0.32	0.67	0.42	0.47	0.60
Avail Cap(c_a), veh/h	1688	996	367	3227	1998	1072
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.4	9.9	26.5	10.7	16.8	4.9
Incr Delay (d2), s/veh	1.9	0.3	3.2	0.1	0.2	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	5.8	1.2	2.2	2.2	8.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.3	10.1	29.6	10.8	17.0	5.7
LnGrp LOS	B	B	C	B	B	A
Approach Vol, veh/h	1143			1345	1480	
Approach Delay, s/veh	16.6			13.0	12.3	
Approach LOS	B			B	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		32.0		27.5	9.5	22.6
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		31.5		34.5	7.5	19.5
Max Q Clear Time (g_c+I1), s		9.7		18.7	5.2	14.9
Green Ext Time (p_c), s		9.0		4.2	0.1	3.1

Intersection Summary	
HCM 6th Ctrl Delay	13.8
HCM 6th LOS	B

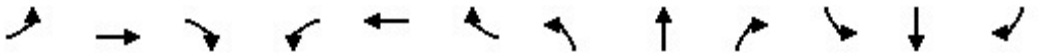
Appendix E

Intersection LOS Analysis Sheets
Opening Year Without Related Projects With Project Conditions



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.962				0.850			0.850		0.994	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4635	0	2891	3353	1500	2891	4818	1500	2891	6034	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4635	0	2891	3353	1500	2891	4818	1500	2891	6034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		65				149			238		9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



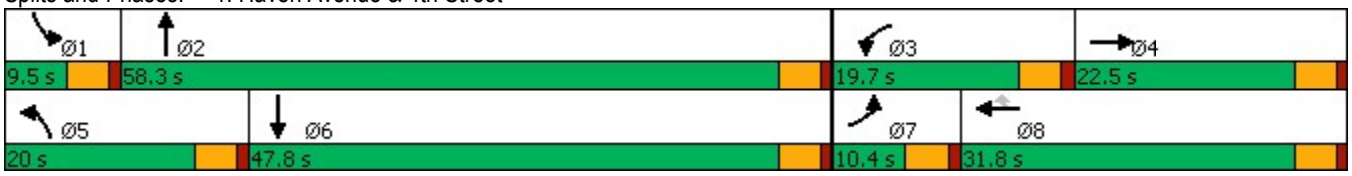
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	93	305	102	274	532	152	209	1539	488	98	1234	55
Future Volume (vph)	93	305	102	274	532	152	209	1539	488	98	1234	55
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	102	335	112	301	585	167	230	1691	536	108	1356	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	102	447	0	301	585	167	230	1691	536	108	1416	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	93	305	274	532	152	209	1539	488	98	1234
Future Volume (vph)	93	305	274	532	152	209	1539	488	98	1234
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	10.4	22.5	19.7	31.8	31.8	20.0	58.3		9.5	47.8
Total Split (%)	9.5%	20.5%	17.9%	28.9%	28.9%	18.2%	53.0%		8.6%	43.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	5.9	15.7	14.3	24.1	24.1	13.2	53.8	106.9	5.0	45.6
Actuated g/C Ratio	0.06	0.15	0.13	0.23	0.23	0.12	0.50	1.00	0.05	0.43
v/c Ratio	0.64	0.61	0.78	0.77	0.37	0.65	0.70	0.36	0.80	0.55
Control Delay	69.1	40.1	59.8	46.4	9.8	53.6	22.6	0.7	89.9	24.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.1	40.1	59.8	46.4	9.8	53.6	22.6	0.7	89.9	24.5
LOS	E	D	E	D	A	D	C	A	F	C
Approach Delay		45.5		44.4			20.7			29.1
Approach LOS		D		D			C			C

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 106.9	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 29.9	Intersection LOS: C
Intersection Capacity Utilization 70.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Haven Avenue & 4th Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	102	447	301	585	167	230	1691	536	108	1416
v/c Ratio	0.64	0.61	0.78	0.77	0.37	0.65	0.70	0.36	0.80	0.55
Control Delay	69.1	40.1	59.8	46.4	9.8	53.6	22.6	0.7	89.9	24.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.1	40.1	59.8	46.4	9.8	53.6	22.6	0.7	89.9	24.5
Queue Length 50th (ft)	36	91	104	198	10	78	321	0	39	212
Queue Length 95th (ft)	#75	127	#165	262	64	120	390	0	#90	263
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	159	834	411	856	494	419	2426	1500	135	2581
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.54	0.73	0.68	0.34	0.55	0.70	0.36	0.80	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

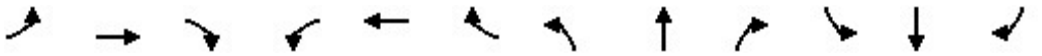
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	305	102	274	532	152	209	1539	488	98	1234	55
Future Volume (veh/h)	93	305	102	274	532	152	209	1539	488	98	1234	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	102	335	112	301	585	167	230	1691	0	108	1356	60
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	148	508	161	358	714	318	290	2497		140	2801	124
Arrive On Green	0.05	0.14	0.14	0.12	0.21	0.21	0.10	0.52	0.00	0.05	0.46	0.46
Sat Flow, veh/h	2910	3635	1154	2910	3367	1502	2910	4837	1502	2910	6029	266
Grp Volume(v), veh/h	102	295	152	301	585	167	230	1691	0	108	1028	388
Grp Sat Flow(s),veh/h/ln	1455	1612	1564	1455	1683	1502	1455	1612	1502	1455	1524	1724
Q Serve(g_s), s	3.6	9.0	9.6	10.5	17.3	10.3	8.1	27.1	0.0	3.8	16.2	16.2
Cycle Q Clear(g_c), s	3.6	9.0	9.6	10.5	17.3	10.3	8.1	27.1	0.0	3.8	16.2	16.2
Prop In Lane	1.00		0.74	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	148	451	219	358	714	318	290	2497		140	2124	801
V/C Ratio(X)	0.69	0.65	0.69	0.84	0.82	0.52	0.79	0.68		0.77	0.48	0.48
Avail Cap(c_a), veh/h	165	557	270	424	882	393	433	2497		140	2124	801
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.6	42.4	42.7	44.7	39.2	36.4	45.9	18.7	0.0	49.0	19.3	19.3
Incr Delay (d2), s/veh	10.1	2.0	5.6	12.3	5.1	1.3	5.9	1.5	0.0	23.1	0.8	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	3.7	4.0	4.4	7.6	3.9	3.1	10.0	0.0	1.8	5.7	6.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.7	44.4	48.3	57.0	44.2	37.7	51.8	20.2	0.0	72.2	20.1	21.4
LnGrp LOS	E	D	D	E	D	D	D	C		E	C	C
Approach Vol, veh/h		549			1053			1921	A		1524	
Approach Delay, s/veh		48.1			46.8			24.0			24.1	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	58.3	17.3	19.1	14.9	52.9	9.8	26.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	53.8	15.2	18.0	15.5	43.3	5.9	27.3
Max Q Clear Time (g_c+I1), s	5.8	29.1	12.5	11.6	10.1	18.2	5.6	19.3
Green Ext Time (p_c), s	0.0	14.5	0.3	1.5	0.4	11.3	0.0	2.8

Intersection Summary	
HCM 6th Ctrl Delay	31.4
HCM 6th LOS	C

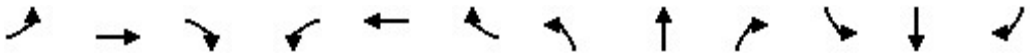
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.988				0.850			0.850		0.850	
Flt Protected	0.950			0.950			0.950					
Satd. Flow (prot)	1583	5998	0	1583	4818	1500	1583	1765	1500	1667	2850	0
Flt Permitted	0.950			0.950			0.950					
Satd. Flow (perm)	1583	5998	0	1583	4818	1500	1583	1765	1500	1667	2850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25				164			164		325	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	38	495	41	1	703	56	43	1	1	0	0	3
Future Volume (vph)	38	495	41	1	703	56	43	1	1	0	0	3
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	42	550	46	1	781	62	48	1	1	0	0	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	596	0	1	781	62	48	1	1	0	3	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBT	Ø1
Lane Configurations										
Traffic Volume (vph)	38	495	1	703	56	43	1	1	0	
Future Volume (vph)	38	495	1	703	56	43	1	1	0	
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	NA	
Protected Phases	7	4	3	8		5	2		6	1
Permitted Phases					8			2		
Detector Phase	7	4	3	8	8	5	2	2	6	
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	22.5	9.5
Total Split (s)	9.5	22.5	9.5	22.5	22.5	11.3	23.0	23.0	26.7	15.0
Total Split (%)	13.6%	32.1%	13.6%	32.1%	32.1%	16.1%	32.9%	32.9%	38.1%	21%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	Min	Min	None
Act Effct Green (s)	5.7	15.9	5.7	14.6	14.6	7.0	9.4	9.4	6.3	
Actuated g/C Ratio	0.15	0.43	0.15	0.40	0.40	0.19	0.25	0.25	0.17	
v/c Ratio	0.17	0.23	0.00	0.41	0.09	0.16	0.00	0.00	0.00	
Control Delay	21.9	7.6	21.0	10.5	0.2	19.8	12.0	0.0	0.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	21.9	7.6	21.0	10.5	0.2	19.8	12.0	0.0	0.0	
LOS	C	A	C	B	A	B	B	A	A	
Approach Delay		8.5		9.7			19.3			
Approach LOS		A		A			B			

Intersection Summary		
Cycle Length: 70		
Actuated Cycle Length: 36.9		
Natural Cycle: 65		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.41		
Intersection Signal Delay: 9.5	Intersection LOS: A	
Intersection Capacity Utilization 39.1%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street

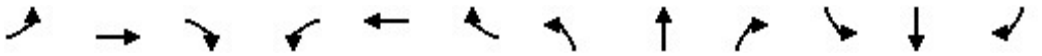
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	42	596	1	781	62	48	1	1	3
v/c Ratio	0.17	0.23	0.00	0.41	0.09	0.16	0.00	0.00	0.00
Control Delay	21.9	7.6	21.0	10.5	0.2	19.8	12.0	0.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.9	7.6	21.0	10.5	0.2	19.8	12.0	0.0	0.0
Queue Length 50th (ft)	6	11	0	20	0	6	0	0	0
Queue Length 95th (ft)	37	55	4	99	0	39	3	0	0
Internal Link Dist (ft)		2546		362			269		358
Turn Bay Length (ft)	130		130		145	165		165	
Base Capacity (vph)	244	3559	244	2679	907	332	1077	979	2057
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.17	0.00	0.29	0.07	0.14	0.00	0.00	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	495	41	1	703	56	43	1	1	0	0	3
Future Volume (veh/h)	38	495	41	1	703	56	43	1	1	0	0	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	42	550	46	1	781	62	48	1	1	0	0	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	75	1982	163	4	1437	446	83	534	453	4	221	197
Arrive On Green	0.05	0.34	0.34	0.00	0.30	0.30	0.05	0.30	0.30	0.00	0.00	0.13
Sat Flow, veh/h	1594	5783	475	1594	4837	1502	1594	1772	1502	1594	1683	1502
Grp Volume(v), veh/h	42	433	163	1	781	62	48	1	1	0	0	3
Grp Sat Flow(s),veh/h/ln	1594	1524	1686	1594	1612	1502	1594	1772	1502	1594	1683	1502
Q Serve(g_s), s	1.0	2.6	2.7	0.0	5.2	1.2	1.1	0.0	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	1.0	2.6	2.7	0.0	5.2	1.2	1.1	0.0	0.0	0.0	0.0	0.1
Prop In Lane	1.00		0.28	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	75	1567	578	4	1437	446	83	534	453	4	221	197
V/C Ratio(X)	0.56	0.28	0.28	0.24	0.54	0.14	0.58	0.00	0.00	0.00	0.00	0.02
Avail Cap(c_a), veh/h	209	2160	797	209	2285	709	284	860	729	439	981	875
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	17.8	9.1	9.1	19.0	11.2	9.8	17.6	9.3	9.3	0.0	0.0	14.4
Incr Delay (d2), s/veh	6.4	0.1	0.3	27.1	0.3	0.1	6.1	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.7	0.8	0.0	1.5	0.3	0.5	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.1	9.2	9.4	46.1	11.6	10.0	23.8	9.3	9.3	0.0	0.0	14.4
LnGrp LOS	C	A	A	D	B	A	C	A	A	A	A	B
Approach Vol, veh/h		638			844			50			3	
Approach Delay, s/veh		10.2			11.5			23.2			14.4	
Approach LOS		B			B			C			B	

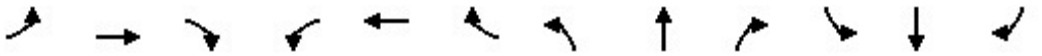
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	0.0	16.0	4.6	17.6	6.5	9.5	6.3	15.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	18.5	5.0	18.0	6.8	22.2	5.0	18.0
Max Q Clear Time (g_c+I1), s	0.0	2.0	2.0	4.7	3.1	2.1	3.0	7.2
Green Ext Time (p_c), s	0.0	0.0	0.0	3.3	0.0	0.0	0.0	4.2

Intersection Summary	
HCM 6th Ctrl Delay	11.3
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.996				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.956	
Satd. Flow (prot)	2891	6065	0	1583	4798	0	1583	1765	1500	0	1687	1500
Flt Permitted	0.950			0.950			0.731				0.740	
Satd. Flow (perm)	2891	6065	0	1583	4798	0	1218	1765	1500	0	1306	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			8				109			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



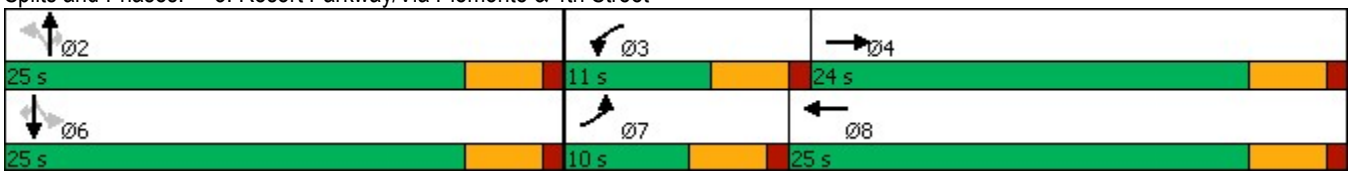
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	15	491	4	36	702	20	28	3	31	34	3	17
Future Volume (vph)	15	491	4	36	702	20	28	3	31	34	3	17
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	16	528	4	39	755	22	30	3	33	37	3	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	532	0	39	777	0	30	3	33	0	40	18

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	15	491	36	702	28	3	31	34	3	17
Future Volume (vph)	15	491	36	702	28	3	31	34	3	17
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8		2			6	
Permitted Phases					2		2	6		6
Detector Phase	7	4	3	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	10.0	24.0	11.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (%)	16.7%	40.0%	18.3%	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	5.9	12.3	6.4	12.4	6.8	6.8	6.8		6.8	6.8
Actuated g/C Ratio	0.20	0.41	0.21	0.41	0.23	0.23	0.23		0.23	0.23
v/c Ratio	0.03	0.21	0.12	0.39	0.11	0.01	0.08		0.14	0.04
Control Delay	14.3	6.6	14.1	7.2	13.4	12.7	0.4		13.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	14.3	6.6	14.1	7.2	13.4	12.7	0.4		13.4	0.2
LOS	B	A	B	A	B	B	A		B	A
Approach Delay		6.8		7.6		6.8			9.3	
Approach LOS		A		A		A			A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 30.1	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.39	
Intersection Signal Delay: 7.3	Intersection LOS: A
Intersection Capacity Utilization 39.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	16	532	39	777	30	3	33	40	18
v/c Ratio	0.03	0.21	0.12	0.39	0.11	0.01	0.08	0.14	0.04
Control Delay	14.3	6.6	14.1	7.2	13.4	12.7	0.4	13.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	6.6	14.1	7.2	13.4	12.7	0.4	13.4	0.2
Queue Length 50th (ft)	1	10	4	21	3	0	0	4	0
Queue Length 95th (ft)	8	40	30	74	24	6	0	29	0
Internal Link Dist (ft)		362		428		302		378	
Turn Bay Length (ft)	220		125		115		115		110
Base Capacity (vph)	562	4185	364	3482	883	1280	1118	947	1118
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.13	0.11	0.22	0.03	0.00	0.03	0.04	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	491	4	36	702	20	28	3	31	34	3	17
Future Volume (veh/h)	15	491	4	36	702	20	28	3	31	34	3	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	16	528	4	39	755	22	30	3	33	37	3	18
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	61	2002	15	74	1662	48	443	304	258	452	27	258
Arrive On Green	0.02	0.32	0.32	0.05	0.34	0.34	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	2910	6287	48	1594	4831	140	1314	1772	1502	1249	159	1502
Grp Volume(v), veh/h	16	384	148	39	503	274	30	3	33	40	0	18
Grp Sat Flow(s),veh/h/ln	1455	1524	1763	1594	1612	1747	1314	1772	1502	1408	0	1502
Q Serve(g_s), s	0.2	1.8	1.8	0.7	3.5	3.5	0.6	0.0	0.5	0.5	0.0	0.3
Cycle Q Clear(g_c), s	0.2	1.8	1.8	0.7	3.5	3.5	1.2	0.0	0.5	0.7	0.0	0.3
Prop In Lane	1.00		0.03	1.00		0.08	1.00		1.00	0.92		1.00
Lane Grp Cap(c), veh/h	61	1456	562	74	1110	601	443	304	258	480	0	258
V/C Ratio(X)	0.26	0.26	0.26	0.53	0.45	0.46	0.07	0.01	0.13	0.08	0.00	0.07
Avail Cap(c_a), veh/h	549	3060	1180	356	2269	1229	1142	1247	1057	1222	0	1057
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.0	7.4	7.4	13.6	7.4	7.4	10.8	10.0	10.2	10.3	0.0	10.1
Incr Delay (d2), s/veh	2.3	0.1	0.2	5.7	0.3	0.5	0.1	0.0	0.2	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.4	0.5	0.3	0.8	0.9	0.1	0.0	0.1	0.2	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.3	7.5	7.6	19.3	7.7	8.0	10.9	10.0	10.4	10.3	0.0	10.2
LnGrp LOS	B	A	A	B	A	A	B	B	B	B	A	B
Approach Vol, veh/h		548			816			66			58	
Approach Delay, s/veh		7.8			8.4			10.6			10.3	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	5.9	13.8		9.5	5.1	14.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		20.5	6.5	19.5		20.5	5.5	20.5				
Max Q Clear Time (g_c+I1), s		3.2	2.7	3.8		2.7	2.2	5.5				
Green Ext Time (p_c), s		0.1	0.0	3.1		0.2	0.0	4.5				

Intersection Summary	
HCM 6th Ctrl Delay	8.3
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.994					0.865
Flt Protected						
Satd. Flow (prot)	4789	0	0	4818	0	1526
Flt Permitted						
Satd. Flow (perm)	4789	0	0	4818	0	1526
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	549	21	0	715	0	23
Future Volume (vph)	549	21	0	715	0	23
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	597	23	0	777	0	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	620	0	0	777	0	25

Intersection Summary

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	549	21	0	715	0	23
Future Vol, veh/h	549	21	0	715	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	597	23	0	777	0	25

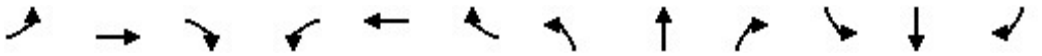
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	310
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	585
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	585
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	585	-	-	-
HCM Lane V/C Ratio	0.043	-	-	-
HCM Control Delay (s)	11.4	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5980	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5980	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			182			286			73		29	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



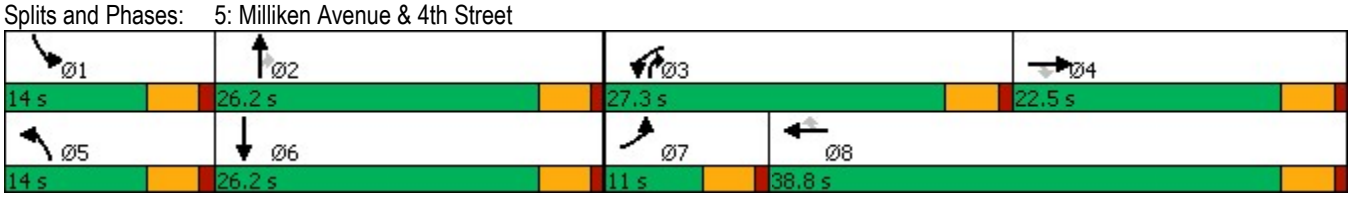
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	147	420	102	466	1198	392	199	953	156	198	827	95
Future Volume (vph)	147	420	102	466	1198	392	199	953	156	198	827	95
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	158	452	110	501	1288	422	214	1025	168	213	889	102
Shared Lane Traffic (%)												
Lane Group Flow (vph)	158	452	110	501	1288	422	214	1025	168	213	991	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	147	420	102	466	1198	392	199	953	156	198	827
Future Volume (vph)	147	420	102	466	1198	392	199	953	156	198	827
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	11.0	22.5	22.5	27.3	38.8	38.8	14.0	26.2	27.3	14.0	26.2
Total Split (%)	12.2%	25.0%	25.0%	30.3%	43.1%	43.1%	15.6%	29.1%	30.3%	15.6%	29.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	6.5	19.8	19.8	19.6	32.8	32.8	9.2	20.6	44.7	9.2	20.6
Actuated g/C Ratio	0.07	0.23	0.23	0.22	0.38	0.38	0.11	0.24	0.51	0.11	0.24
v/c Ratio	0.73	0.41	0.23	0.77	0.71	0.57	0.70	0.71	0.21	0.70	0.69
Control Delay	61.7	31.2	1.8	40.7	25.9	10.3	51.8	34.0	6.9	51.7	32.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.7	31.2	1.8	40.7	25.9	10.3	51.8	34.0	6.9	51.7	32.6
LOS	E	C	A	D	C	B	D	C	A	D	C
Approach Delay		33.4			26.3			33.5			36.0
Approach LOS		C			C			C			D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 87.3	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 31.1	Intersection LOS: C
Intersection Capacity Utilization 65.7%	ICU Level of Service C
Analysis Period (min) 15	

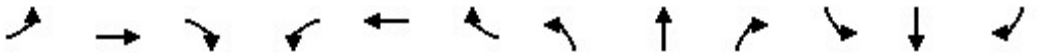
Splits and Phases: 5: Milliken Avenue & 4th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	158	452	110	501	1288	422	214	1025	168	213	991
v/c Ratio	0.73	0.41	0.23	0.77	0.71	0.57	0.70	0.71	0.21	0.70	0.69
Control Delay	61.7	31.2	1.8	40.7	25.9	10.3	51.8	34.0	6.9	51.7	32.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.7	31.2	1.8	40.7	25.9	10.3	51.8	34.0	6.9	51.7	32.6
Queue Length 50th (ft)	46	80	0	137	222	52	61	155	26	61	144
Queue Length 95th (ft)	#95	116	7	187	273	140	#108	192	56	#108	181
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	215	1091	480	758	1900	764	316	1514	858	316	1513
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.41	0.23	0.66	0.68	0.55	0.68	0.68	0.20	0.67	0.65

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



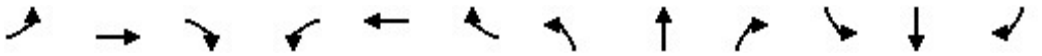
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	147	420	102	466	1198	392	199	953	156	198	827	95
Future Volume (veh/h)	147	420	102	466	1198	392	199	953	156	198	827	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	158	452	110	501	1288	422	214	1025	168	213	889	102
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	220	1174	365	596	1799	558	283	1414	656	282	1296	147
Arrive On Green	0.08	0.24	0.24	0.20	0.37	0.37	0.10	0.23	0.23	0.10	0.23	0.23
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	2910	6095	1502	2910	5596	634
Grp Volume(v), veh/h	158	452	110	501	1288	422	214	1025	168	213	724	267
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1455	1524	1502	1455	1524	1658
Q Serve(g_s), s	4.3	6.3	4.8	13.3	18.4	19.8	5.8	12.5	5.7	5.7	11.6	11.9
Cycle Q Clear(g_c), s	4.3	6.3	4.8	13.3	18.4	19.8	5.8	12.5	5.7	5.7	11.6	11.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.38
Lane Grp Cap(c), veh/h	220	1174	365	596	1799	558	283	1414	656	282	1059	384
V/C Ratio(X)	0.72	0.38	0.30	0.84	0.72	0.76	0.76	0.73	0.26	0.76	0.68	0.69
Avail Cap(c_a), veh/h	235	1174	365	824	2060	640	343	1643	712	343	1232	447
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.4	25.5	24.9	30.7	21.6	22.1	35.4	28.6	14.4	35.4	28.2	28.3
Incr Delay (d2), s/veh	9.4	0.2	0.5	5.7	1.0	4.5	7.6	1.4	0.2	7.5	1.3	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	2.4	1.7	5.0	6.7	7.2	2.3	4.5	1.9	2.3	4.2	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.7	25.7	25.4	36.4	22.7	26.6	43.0	29.9	14.6	42.9	29.5	32.2
LnGrp LOS	D	C	C	D	C	C	D	C	B	D	C	C
Approach Vol, veh/h		720			2211			1407			1204	
Approach Delay, s/veh		30.0			26.5			30.1			32.5	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.3	23.2	21.0	24.0	12.3	23.2	10.6	34.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	21.7	22.8	18.0	9.5	21.7	6.5	34.3
Max Q Clear Time (g_c+I1), s	7.7	14.5	15.3	8.3	7.8	13.9	6.3	21.8
Green Ext Time (p_c), s	0.1	4.2	1.2	2.4	0.1	3.9	0.0	8.2

Intersection Summary	
HCM 6th Ctrl Delay	29.2
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.900	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2891	1365
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2891	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136			136			136		215	215
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



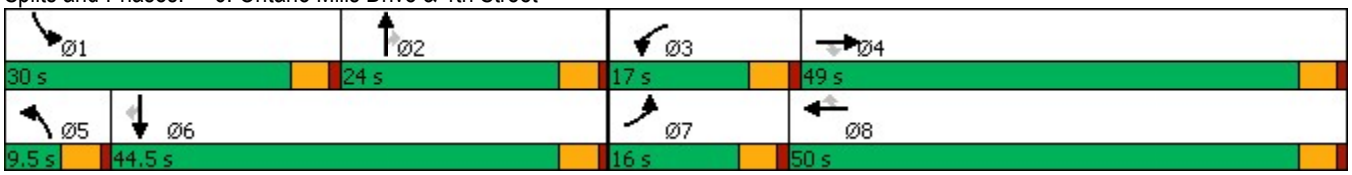
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	286	383	59	110	1303	131	72	71	78	147	223	881
Future Volume (vph)	286	383	59	110	1303	131	72	71	78	147	223	881
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	329	440	68	126	1498	151	83	82	90	169	256	1013
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	329	440	68	126	1498	151	83	82	90	169	763	506

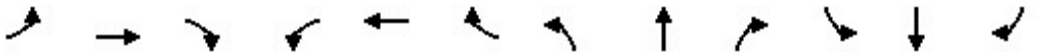
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	286	383	59	110	1303	131	72	71	78	147	223	881
Future Volume (vph)	286	383	59	110	1303	131	72	71	78	147	223	881
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	16.0	49.0	49.0	17.0	50.0	50.0	9.5	24.0	24.0	30.0	44.5	44.5
Total Split (%)	13.3%	40.8%	40.8%	14.2%	41.7%	41.7%	7.9%	20.0%	20.0%	25.0%	37.1%	37.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	11.7	44.7	44.7	10.1	43.1	43.1	5.1	22.3	22.3	17.4	34.6	34.6
Actuated g/C Ratio	0.10	0.40	0.40	0.09	0.38	0.38	0.05	0.20	0.20	0.15	0.31	0.31
v/c Ratio	1.10	0.23	0.10	0.49	0.81	0.23	1.19	0.12	0.22	0.70	0.87dr	0.89
Control Delay	129.9	24.1	0.3	57.1	36.0	6.3	212.2	40.1	3.3	61.1	29.2	40.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	129.9	24.1	0.3	57.1	36.0	6.3	212.2	40.1	3.3	61.1	29.2	40.5
LOS	F	C	A	E	D	A	F	D	A	E	C	D
Approach Delay		63.7			35.0			83.1			36.9	
Approach LOS		E			C			F			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 112.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 44.1	Intersection LOS: D
Intersection Capacity Utilization 80.7%	ICU Level of Service D
Analysis Period (min) 15	
dr Defacto Right Lane. Recode with 1 though lane as a right lane.	

Splits and Phases: 6: Ontario Mills Drive & 4th Street





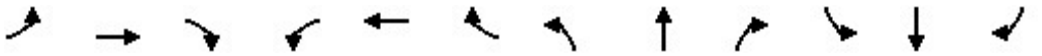
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	329	440	68	126	1498	151	83	82	90	169	763	506
v/c Ratio	1.10	0.23	0.10	0.49	0.81	0.23	1.19	0.12	0.22	0.70	0.87dr	0.89
Control Delay	129.9	24.1	0.3	57.1	36.0	6.3	212.2	40.1	3.3	61.1	29.2	40.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	129.9	24.1	0.3	57.1	36.0	6.3	212.2	40.1	3.3	61.1	29.2	40.5
Queue Length 50th (ft)	~158	83	0	48	379	7	~81	26	0	126	203	246
Queue Length 95th (ft)	#240	109	0	76	420	47	#179	51	11	183	263	#431
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	299	1976	695	325	1970	694	70	687	415	362	1177	628
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.10	0.22	0.10	0.39	0.76	0.22	1.19	0.12	0.22	0.47	0.65	0.81

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



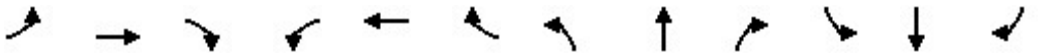
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	286	383	59	110	1303	131	72	71	78	147	223	881
Future Volume (veh/h)	286	383	59	110	1303	131	72	71	78	147	223	881
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	329	440	68	126	1498	151	83	82	90	169	256	1013
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	286	1944	603	174	1759	546	68	879	392	197	606	1026
Arrive On Green	0.10	0.40	0.40	0.06	0.36	0.36	0.04	0.26	0.26	0.12	0.34	0.34
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	1594	3367	1502	1594	1772	3003
Grp Volume(v), veh/h	329	440	68	126	1498	151	83	82	90	169	256	1013
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1594	1683	1502	1594	1772	1502
Q Serve(g_s), s	11.5	7.0	3.3	5.0	33.4	8.3	5.0	2.2	5.5	12.2	13.0	39.2
Cycle Q Clear(g_c), s	11.5	7.0	3.3	5.0	33.4	8.3	5.0	2.2	5.5	12.2	13.0	39.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	286	1944	603	174	1759	546	68	879	392	197	606	1026
V/C Ratio(X)	1.15	0.23	0.11	0.72	0.85	0.28	1.22	0.09	0.23	0.86	0.42	0.99
Avail Cap(c_a), veh/h	286	1944	603	311	1880	584	68	879	392	347	606	1026
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.8	23.0	21.9	54.1	34.3	26.4	56.0	32.8	34.0	50.3	29.6	38.3
Incr Delay (d2), s/veh	100.3	0.1	0.1	5.6	3.8	0.3	179.4	0.0	0.3	10.4	0.5	24.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	2.7	1.2	2.0	13.5	3.0	5.4	0.9	2.1	5.4	5.6	17.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	153.1	23.1	22.0	59.6	38.1	26.6	235.5	32.8	34.3	60.7	30.1	63.1
LnGrp LOS	F	C	C	E	D	C	F	C	C	E	C	E
Approach Vol, veh/h		837			1775			255			1438	
Approach Delay, s/veh		74.1			38.7			99.3			57.0	
Approach LOS		E			D			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.9	35.1	11.5	51.5	9.5	44.5	16.0	47.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	25.5	19.5	12.5	44.5	5.0	40.0	11.5	45.5
Max Q Clear Time (g_c+I1), s	14.2	7.5	7.0	9.0	7.0	41.2	13.5	35.4
Green Ext Time (p_c), s	0.3	0.5	0.2	3.5	0.0	0.0	0.0	7.1

Intersection Summary	
HCM 6th Ctrl Delay	55.3
HCM 6th LOS	E

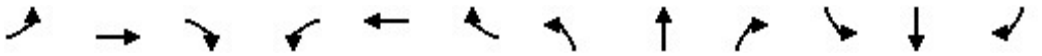
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.983			0.892				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.966	
Satd. Flow (prot)	2891	4818	1500	1583	4736	0	1583	2991	0	1504	1619	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.966	
Satd. Flow (perm)	2891	4818	1500	1583	4736	0	1583	2991	0	1504	1619	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127		24			60				492
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



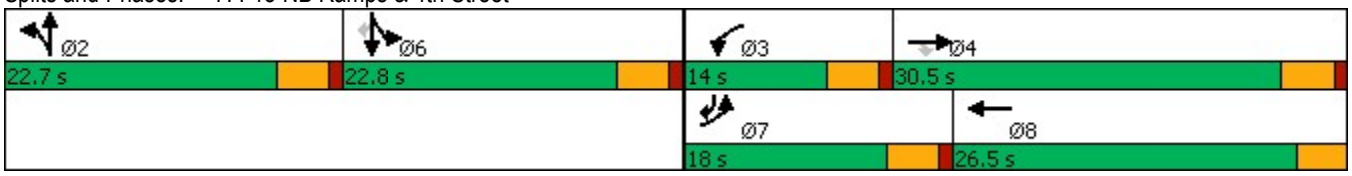
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	212	347	77	45	478	62	110	22	57	370	66	961
Future Volume (vph)	212	347	77	45	478	62	110	22	57	370	66	961
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	223	365	81	47	503	65	116	23	60	389	69	1012
Shared Lane Traffic (%)										42%		
Lane Group Flow (vph)	223	365	81	47	568	0	116	83	0	226	232	1012

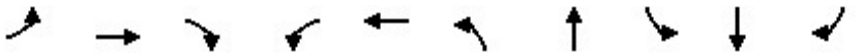
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	212	347	77	45	478	110	22	370	66	961
Future Volume (vph)	212	347	77	45	478	110	22	370	66	961
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	18.0	30.5	30.5	14.0	26.5	22.7	22.7	22.8	22.8	18.0
Total Split (%)	20.0%	33.9%	33.9%	15.6%	29.4%	25.2%	25.2%	25.3%	25.3%	20.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	12.0	23.2	23.2	7.5	14.6	10.7	10.7	15.2	15.2	31.8
Actuated g/C Ratio	0.17	0.33	0.33	0.11	0.21	0.15	0.15	0.22	0.22	0.45
v/c Ratio	0.45	0.23	0.14	0.28	0.57	0.48	0.16	0.69	0.66	0.69
Control Delay	31.7	20.4	2.2	36.9	27.1	36.6	13.1	39.9	37.2	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.7	20.4	2.2	36.9	27.1	36.6	13.1	39.9	37.2	10.8
LOS	C	C	A	D	C	D	B	D	D	B
Approach Delay		22.0			27.8		26.8		19.4	
Approach LOS		C			C		C		B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 70.1	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 22.2	Intersection LOS: C
Intersection Capacity Utilization 64.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street

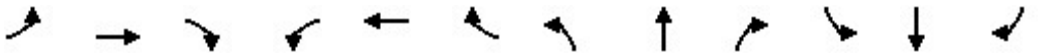




Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	223	365	81	47	568	116	83	226	232	1012
v/c Ratio	0.45	0.23	0.14	0.28	0.57	0.48	0.16	0.69	0.66	0.69
Control Delay	31.7	20.4	2.2	36.9	27.1	36.6	13.1	39.9	37.2	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.7	20.4	2.2	36.9	27.1	36.6	13.1	39.9	37.2	10.8
Queue Length 50th (ft)	45	47	0	20	81	49	4	96	98	86
Queue Length 95th (ft)	91	81	13	56	126	105	24	#220	#207	204
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	575	1868	659	221	1621	424	846	405	436	1528
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.20	0.12	0.21	0.35	0.27	0.10	0.56	0.53	0.66

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	212	347	77	45	478	62	110	22	57	370	66	961
Future Volume (veh/h)	212	347	77	45	478	62	110	22	57	370	66	961
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	223	365	81	47	503	65	116	23	60	438	0	1012
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	321	1241	385	71	830	106	177	187	167	944	0	1220
Arrive On Green	0.11	0.26	0.26	0.04	0.19	0.19	0.11	0.11	0.11	0.30	0.00	0.30
Sat Flow, veh/h	2910	4837	1502	1594	4345	553	1594	1683	1502	3188	0	3003
Grp Volume(v), veh/h	223	365	81	47	371	197	116	23	60	438	0	1012
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1594	1612	1672	1594	1683	1502	1594	0	1502
Q Serve(g_s), s	4.6	3.8	2.6	1.8	6.5	6.7	4.3	0.8	2.3	6.9	0.0	18.3
Cycle Q Clear(g_c), s	4.6	3.8	2.6	1.8	6.5	6.7	4.3	0.8	2.3	6.9	0.0	18.3
Prop In Lane	1.00		1.00	1.00		0.33	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	321	1241	385	71	616	319	177	187	167	944	0	1220
V/C Ratio(X)	0.69	0.29	0.21	0.66	0.60	0.62	0.65	0.12	0.36	0.46	0.00	0.83
Avail Cap(c_a), veh/h	636	2035	632	245	1200	622	469	496	442	944	0	1220
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.5	18.5	18.1	29.1	22.9	22.9	26.3	24.7	25.4	17.8	0.0	16.4
Incr Delay (d2), s/veh	2.7	0.1	0.3	9.9	1.0	1.9	4.0	0.3	1.3	0.4	0.0	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	1.3	0.9	0.8	2.4	2.6	1.7	0.3	0.8	2.4	0.0	6.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.2	18.6	18.3	38.9	23.8	24.8	30.3	25.0	26.7	18.1	0.0	21.3
LnGrp LOS	C	B	B	D	C	C	C	C	C	B	A	C
Approach Vol, veh/h		669			615			199			1450	
Approach Delay, s/veh		22.1			25.3			28.6			20.4	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		11.4	7.3	20.4		22.8	11.3	16.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		18.2	9.5	26.0		18.3	13.5	* 23				
Max Q Clear Time (g_c+I1), s		6.3	3.8	5.8		20.3	6.6	8.7				
Green Ext Time (p_c), s		0.6	0.0	2.6		0.0	0.4	3.1				

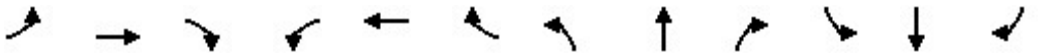
Intersection Summary	
HCM 6th Ctrl Delay	22.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

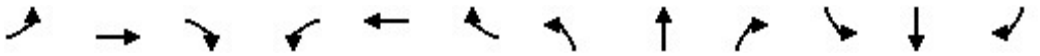
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

User approved changes to right turn type.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.904				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3031	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3031	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		90				182			182			182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



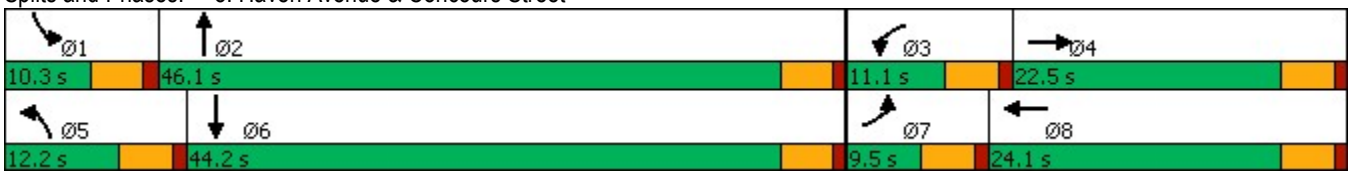
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	21	45	81	163	59	18	71	1812	146	97	1405	44
Future Volume (vph)	21	45	81	163	59	18	71	1812	146	97	1405	44
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	23	50	90	181	66	20	79	2013	162	108	1561	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	140	0	181	66	20	79	2013	162	108	1561	49

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	21	45	163	59	18	71	1812	146	97	1405	44
Future Volume (vph)	21	45	163	59	18	71	1812	146	97	1405	44
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	11.1	24.1		12.2	46.1		10.3	44.2	
Total Split (%)	10.6%	25.0%	12.3%	26.8%		13.6%	51.2%		11.4%	49.1%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.1	7.0	6.7	14.7	75.5	7.0	40.3	75.5	5.9	39.1	75.5
Actuated g/C Ratio	0.07	0.09	0.09	0.19	1.00	0.09	0.53	1.00	0.08	0.52	1.00
v/c Ratio	0.12	0.39	0.52	0.10	0.01	0.29	0.62	0.11	0.48	0.50	0.03
Control Delay	37.1	17.9	40.4	29.7	0.0	36.9	13.8	0.1	43.3	13.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.1	17.9	40.4	29.7	0.0	36.9	13.8	0.1	43.3	13.1	0.0
LOS	D	B	D	C	A	D	B	A	D	B	A
Approach Delay		20.6		34.7			13.7			14.7	
Approach LOS		C		C			B			B	

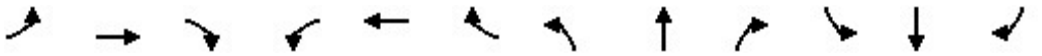
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 75.5	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 15.6	Intersection LOS: B
Intersection Capacity Utilization 55.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	23	140	181	66	20	79	2013	162	108	1561	49
v/c Ratio	0.12	0.39	0.52	0.10	0.01	0.29	0.62	0.11	0.48	0.50	0.03
Control Delay	37.1	17.9	40.4	29.7	0.0	36.9	13.8	0.1	43.3	13.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.1	17.9	40.4	29.7	0.0	36.9	13.8	0.1	43.3	13.1	0.0
Queue Length 50th (ft)	5	12	30	13	0	19	189	0	26	139	0
Queue Length 95th (ft)	17	38	53	34	0	40	244	0	53	183	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	194	800	348	882	1500	298	3389	1500	225	3253	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.17	0.52	0.07	0.01	0.27	0.59	0.11	0.48	0.48	0.03

Intersection Summary



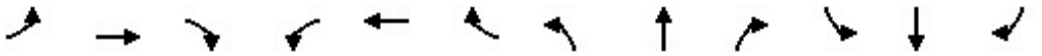
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	45	81	163	59	18	71	1812	146	97	1405	44
Future Volume (veh/h)	21	45	81	163	59	18	71	1812	146	97	1405	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	23	50	90	181	66	0	79	2013	0	108	1561	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	75	157	140	287	471		165	3109		184	3150	
Arrive On Green	0.03	0.09	0.09	0.07	0.14	0.00	0.06	0.51	0.00	0.06	0.52	0.00
Sat Flow, veh/h	2910	1683	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	23	50	90	181	66	0	79	2013	0	108	1561	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	0.5	1.9	4.0	3.1	1.2	0.0	1.8	16.7	0.0	2.5	11.5	0.0
Cycle Q Clear(g_c), s	0.5	1.9	4.0	3.1	1.2	0.0	1.8	16.7	0.0	2.5	11.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	75	157	140	287	471		165	3109		184	3150	
V/C Ratio(X)	0.31	0.32	0.64	0.63	0.14		0.48	0.65		0.59	0.50	
Avail Cap(c_a), veh/h	211	439	392	380	957		325	3677		245	3509	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.0	29.2	30.2	31.1	26.0	0.0	31.6	12.4	0.0	31.4	10.8	0.0
Incr Delay (d2), s/veh	2.3	1.2	4.8	2.3	0.1	0.0	2.2	0.3	0.0	2.9	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.8	1.6	1.0	0.5	0.0	0.7	4.9	0.0	0.9	3.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.2	30.4	35.0	33.4	26.2	0.0	33.7	12.7	0.0	34.4	10.9	0.0
LnGrp LOS	D	C	D	C	C		C	B		C	B	
Approach Vol, veh/h		163			247	A		2092	A		1669	A
Approach Delay, s/veh		33.6			31.5			13.5			12.5	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.9	39.7	9.5	10.9	8.4	40.1	6.3	14.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.8	41.6	6.6	18.0	7.7	39.7	5.0	19.6
Max Q Clear Time (g_c+I1), s	4.5	18.7	5.1	6.0	3.8	13.5	2.5	3.2
Green Ext Time (p_c), s	0.0	16.5	0.1	0.5	0.1	13.7	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	14.9
HCM 6th LOS	B

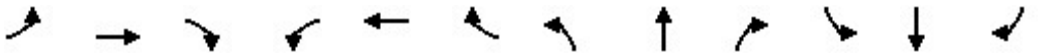
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.992			0.973			0.994			0.980	
Flt Protected	0.950	0.955			0.971		0.950			0.950		
Satd. Flow (prot)	1593	1588	0	0	1667	0	1676	4789	0	1676	4721	0
Flt Permitted	0.950	0.955					0.950			0.950		
Satd. Flow (perm)	1593	1588	0	0	1717	0	1676	4789	0	1676	4721	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		143			1			8			35	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



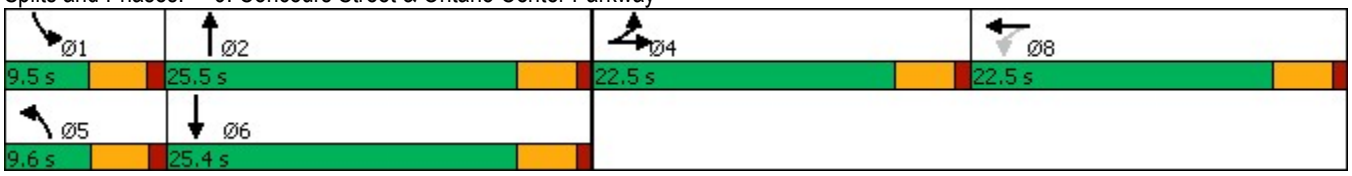
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	99	0	3	3	1	1	48	495	21	1	683	106
Future Volume (vph)	99	0	3	3	1	1	48	495	21	1	683	106
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	110	0	3	3	1	1	53	550	23	1	759	118
Shared Lane Traffic (%)	48%											
Lane Group Flow (vph)	57	56	0	0	5	0	53	573	0	1	877	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	99	0	3	1	48	495	1	683
Future Volume (vph)	99	0	3	1	48	495	1	683
Turn Type	Split	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	4	4		8	5	2	1	6
Permitted Phases			8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	9.6	25.5	9.5	25.4
Total Split (%)	28.1%	28.1%	28.1%	28.1%	12.0%	31.9%	11.9%	31.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	7.4	7.4		6.1	5.5	26.2	5.3	24.3
Actuated g/C Ratio	0.18	0.18		0.15	0.13	0.63	0.13	0.58
v/c Ratio	0.20	0.14		0.02	0.24	0.19	0.00	0.32
Control Delay	19.7	0.7		19.5	23.7	6.7	22.0	8.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	19.7	0.7		19.5	23.7	6.7	22.0	8.4
LOS	B	A		B	C	A	C	A
Approach Delay		10.3		19.5		8.2		8.4
Approach LOS		B		B		A		A

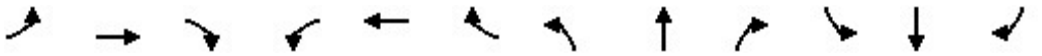
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 41.6	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.32	
Intersection Signal Delay: 8.5	Intersection LOS: A
Intersection Capacity Utilization 36.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	57	56	5	53	573	1	877
v/c Ratio	0.20	0.14	0.02	0.24	0.19	0.00	0.32
Control Delay	19.7	0.7	19.5	23.7	6.7	22.0	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.7	0.7	19.5	23.7	6.7	22.0	8.4
Queue Length 50th (ft)	9	0	1	10	16	0	26
Queue Length 95th (ft)	48	0	10	48	78	5	120
Internal Link Dist (ft)		319	68		111		176
Turn Bay Length (ft)	170			115		120	
Base Capacity (vph)	737	811	794	219	3042	215	2880
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.07	0.01	0.24	0.19	0.00	0.30

Intersection Summary



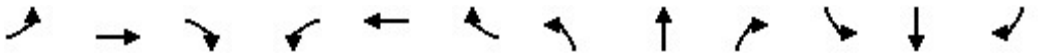
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	0	3	3	1	1	48	495	21	1	683	106
Future Volume (veh/h)	99	0	3	3	1	1	48	495	21	1	683	106
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	113	0	0	3	1	1	53	550	23	1	759	118
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	318	167	0	7	2	2	97	1883	78	5	1435	221
Arrive On Green	0.09	0.00	0.00	0.01	0.01	0.01	0.06	0.40	0.40	0.00	0.34	0.34
Sat Flow, veh/h	3375	1772	0	997	332	332	1688	4763	198	1688	4228	652
Grp Volume(v), veh/h	113	0	0	5	0	0	53	371	202	1	578	299
Grp Sat Flow(s),veh/h/ln	1688	1772	0	1662	0	0	1688	1612	1736	1688	1612	1655
Q Serve(g_s), s	1.1	0.0	0.0	0.1	0.0	0.0	1.1	2.8	2.8	0.0	5.2	5.2
Cycle Q Clear(g_c), s	1.1	0.0	0.0	0.1	0.0	0.0	1.1	2.8	2.8	0.0	5.2	5.2
Prop In Lane	1.00		0.00	0.60		0.20	1.00		0.11	1.00		0.39
Lane Grp Cap(c), veh/h	318	167	0	11	0	0	97	1275	686	5	1095	562
V/C Ratio(X)	0.36	0.00	0.00	0.44	0.00	0.00	0.55	0.29	0.29	0.21	0.53	0.53
Avail Cap(c_a), veh/h	1695	890	0	835	0	0	240	1890	1018	235	1881	965
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.2	0.0	0.0	17.7	0.0	0.0	16.4	7.4	7.4	17.9	9.5	9.5
Incr Delay (d2), s/veh	0.7	0.0	0.0	25.1	0.0	0.0	4.8	0.1	0.2	21.0	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.1	0.0	0.0	0.5	0.7	0.8	0.0	1.4	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.9	0.0	0.0	42.8	0.0	0.0	21.2	7.5	7.6	38.9	9.9	10.3
LnGrp LOS	B	A	A	D	A	A	C	A	A	D	A	B
Approach Vol, veh/h		113			5			626			878	
Approach Delay, s/veh		15.9			42.8			8.7			10.1	
Approach LOS		B			D			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.5	18.7		7.9	6.5	16.7		4.7				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	21.0		18.0	5.1	20.9		18.0				
Max Q Clear Time (g_c+I1), s	2.0	4.8		3.1	3.1	7.2		2.1				
Green Ext Time (p_c), s	0.0	3.3		0.3	0.0	4.9		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		10.1
HCM 6th LOS		B

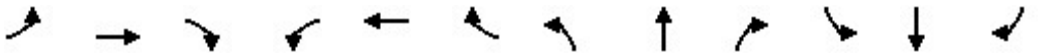
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			234			234			234			291
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



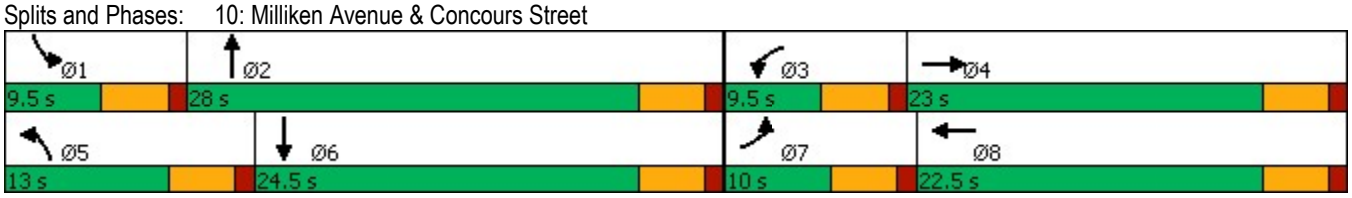
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	100	24	121	49	78	40	190	938	59	53	899	250
Future Volume (vph)	100	24	121	49	78	40	190	938	59	53	899	250
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	116	28	141	57	91	47	221	1091	69	62	1045	291
Shared Lane Traffic (%)												
Lane Group Flow (vph)	116	28	141	57	91	47	221	1091	69	62	1045	291

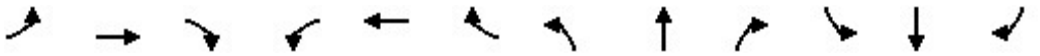
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	24	121	49	78	40	190	938	59	53	899	250
Future Volume (vph)	100	24	121	49	78	40	190	938	59	53	899	250
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	10.0	23.0		9.5	22.5		13.0	28.0		9.5	24.5	
Total Split (%)	14.3%	32.9%		13.6%	32.1%		18.6%	40.0%		13.6%	35.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	5.7	11.0	54.3	5.1	7.0	54.3	8.2	29.5	54.3	5.1	20.5	54.3
Actuated g/C Ratio	0.10	0.20	1.00	0.09	0.13	1.00	0.15	0.54	1.00	0.09	0.38	1.00
v/c Ratio	0.39	0.04	0.09	0.21	0.21	0.03	0.50	0.33	0.05	0.23	0.46	0.19
Control Delay	29.5	20.9	0.1	27.4	24.4	0.1	27.6	11.2	0.1	27.7	15.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.5	20.9	0.1	27.4	24.4	0.1	27.6	11.2	0.1	27.7	15.4	0.3
LOS	C	C	A	C	C	A	C	B	A	C	B	A
Approach Delay		14.1			19.4			13.3			12.8	
Approach LOS		B			B			B			B	

Intersection Summary		
Cycle Length: 70		
Actuated Cycle Length: 54.3		
Natural Cycle: 65		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.50		
Intersection Signal Delay: 13.5	Intersection LOS: B	
Intersection Capacity Utilization 41.5%	ICU Level of Service A	
Analysis Period (min) 15		

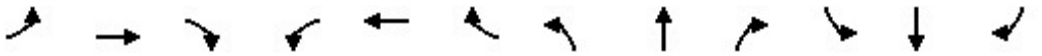
Splits and Phases: 10: Milliken Avenue & Concours Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	116	28	141	57	91	47	221	1091	69	62	1045	291
v/c Ratio	0.39	0.04	0.09	0.21	0.21	0.03	0.50	0.33	0.05	0.23	0.46	0.19
Control Delay	29.5	20.9	0.1	27.4	24.4	0.1	27.6	11.2	0.1	27.7	15.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.5	20.9	0.1	27.4	24.4	0.1	27.6	11.2	0.1	27.7	15.4	0.3
Queue Length 50th (ft)	20	3	0	9	15	0	37	79	0	10	84	0
Queue Length 95th (ft)	41	14	0	24	32	0	66	103	0	25	109	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	301	1175	1500	273	1143	1500	465	3312	1500	273	2383	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.02	0.09	0.21	0.08	0.03	0.48	0.33	0.05	0.23	0.44	0.19

Intersection Summary



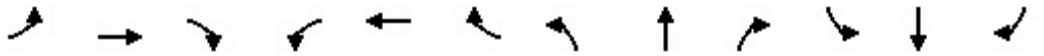
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	24	121	49	78	40	190	938	59	53	899	250
Future Volume (veh/h)	100	24	121	49	78	40	190	938	59	53	899	250
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	116	28	0	57	91	0	221	1091	0	62	1045	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	246	424		164	330		332	2211		174	1879	
Arrive On Green	0.08	0.13	0.00	0.06	0.10	0.00	0.11	0.36	0.00	0.06	0.31	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	116	28	0	57	91	0	221	1091	0	62	1045	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	1.7	0.3	0.0	0.9	1.1	0.0	3.3	6.3	0.0	0.9	6.5	0.0
Cycle Q Clear(g_c), s	1.7	0.3	0.0	0.9	1.1	0.0	3.3	6.3	0.0	0.9	6.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	246	424		164	330		332	2211		174	1879	
V/C Ratio(X)	0.47	0.07		0.35	0.28		0.67	0.49		0.36	0.56	
Avail Cap(c_a), veh/h	351	1368		319	1331		543	3145		319	2677	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.9	17.5	0.0	20.7	19.0	0.0	19.3	11.3	0.0	20.6	13.2	0.0
Incr Delay (d2), s/veh	1.4	0.1	0.0	1.3	0.4	0.0	2.3	0.2	0.0	1.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.1	0.0	0.3	0.4	0.0	1.1	1.7	0.0	0.3	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.3	17.6	0.0	21.9	19.5	0.0	21.6	11.4	0.0	21.8	13.4	0.0
LnGrp LOS	C	B		C	B		C	B		C	B	
Approach Vol, veh/h		144	A		148	A		1312	A		1107	A
Approach Delay, s/veh		20.6			20.4			13.2			13.9	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.2	21.0	7.1	10.2	9.7	18.5	8.3	9.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	23.5	5.0	18.5	8.5	20.0	5.5	18.0
Max Q Clear Time (g_c+I1), s	2.9	8.3	2.9	2.3	5.3	8.5	3.7	3.1
Green Ext Time (p_c), s	0.0	6.8	0.0	0.1	0.2	5.5	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	14.2
HCM 6th LOS	B

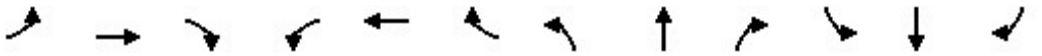
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			236			434			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



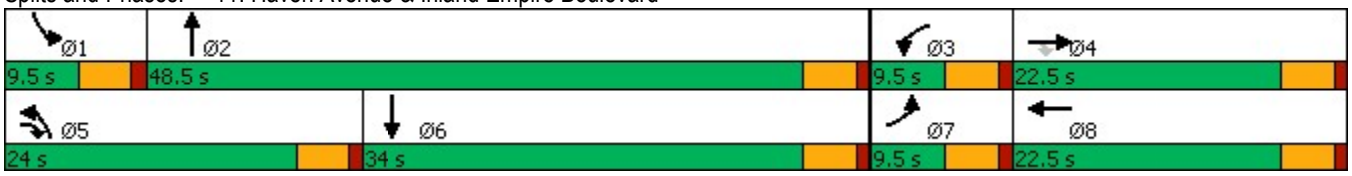
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	53	98	239	118	103	21	460	2095	647	52	1384	75
Future Volume (vph)	53	98	239	118	103	21	460	2095	647	52	1384	75
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	57	105	257	127	111	23	495	2253	696	56	1488	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	105	257	127	111	23	495	2253	696	56	1488	81

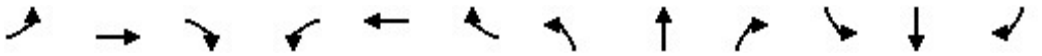
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	98	239	118	103	21	460	2095	647	52	1384	75
Future Volume (vph)	53	98	239	118	103	21	460	2095	647	52	1384	75
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	24.0	9.5	22.5		24.0	48.5		9.5	34.0	
Total Split (%)	10.6%	25.0%	26.7%	10.6%	25.0%		26.7%	53.9%		10.6%	37.8%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.3	8.1	27.1	5.3	10.0	72.2	17.7	47.6	72.2	5.3	28.6	72.2
Actuated g/C Ratio	0.07	0.11	0.38	0.07	0.14	1.00	0.25	0.66	1.00	0.07	0.40	1.00
v/c Ratio	0.27	0.28	0.42	0.44	0.24	0.02	0.70	0.56	0.46	0.26	0.62	0.05
Control Delay	39.7	35.1	14.4	41.7	33.4	0.0	33.0	11.2	1.0	39.6	20.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.7	35.1	14.4	41.7	33.4	0.0	33.0	11.2	1.0	39.6	20.7	0.1
LOS	D	D	B	D	C	A	C	B	A	D	C	A
Approach Delay		23.0			34.5			12.3			20.3	
Approach LOS		C			C			B			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 72.2	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 16.3	Intersection LOS: B
Intersection Capacity Utilization 57.5%	ICU Level of Service B
Analysis Period (min) 15	

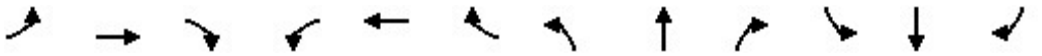
Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	105	257	127	111	23	495	2253	696	56	1488	81
v/c Ratio	0.27	0.28	0.42	0.44	0.24	0.02	0.70	0.56	0.46	0.26	0.62	0.05
Control Delay	39.7	35.1	14.4	41.7	33.4	0.0	33.0	11.2	1.0	39.6	20.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.7	35.1	14.4	41.7	33.4	0.0	33.0	11.2	1.0	39.6	20.7	0.1
Queue Length 50th (ft)	14	26	61	22	27	0	116	217	0	13	177	0
Queue Length 95th (ft)	32	50	120	41	52	0	174	274	0	32	225	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	213	892	670	291	892	1500	833	3999	1500	213	2647	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.12	0.38	0.44	0.12	0.02	0.59	0.56	0.46	0.26	0.56	0.05

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	98	239	118	103	21	460	2095	647	52	1384	75
Future Volume (veh/h)	53	98	239	118	103	21	460	2095	647	52	1384	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	57	105	257	127	111	0	495	2253	0	56	1488	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	131	557	548	233	604		580	3089		129	2146	
Arrive On Green	0.04	0.17	0.17	0.06	0.18	0.00	0.20	0.51	0.00	0.04	0.35	0.00
Sat Flow, veh/h	2910	3367	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	57	105	257	127	111	0	495	2253	0	56	1488	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	1.5	2.2	10.5	2.5	2.2	0.0	13.2	23.2	0.0	1.5	16.8	0.0
Cycle Q Clear(g_c), s	1.5	2.2	10.5	2.5	2.2	0.0	13.2	23.2	0.0	1.5	16.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	131	557	548	233	604		580	3089		129	2146	
V/C Ratio(X)	0.44	0.19	0.47	0.55	0.18		0.85	0.73		0.43	0.69	
Avail Cap(c_a), veh/h	182	756	636	247	756		708	3346		182	2243	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	37.3	28.8	19.5	36.7	27.9	0.0	31.0	15.5	0.0	37.3	22.3	0.0
Incr Delay (d2), s/veh	2.3	0.2	0.6	2.2	0.1	0.0	8.5	0.8	0.0	2.3	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.9	3.6	0.8	0.9	0.0	5.1	7.4	0.0	0.6	5.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.6	29.0	20.1	38.9	28.1	0.0	39.5	16.2	0.0	39.6	23.1	0.0
LnGrp LOS	D	C	C	D	C		D	B		D	C	
Approach Vol, veh/h		419			238	A		2748	A		1544	A
Approach Delay, s/veh		25.0			33.8			20.4			23.7	
Approach LOS		C			C			C			C	

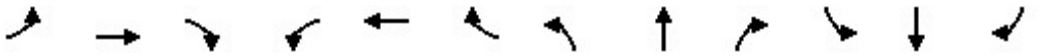
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	45.1	9.2	17.8	20.5	32.7	8.1	18.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	44.0	5.0	18.0	19.5	29.5	5.0	18.0
Max Q Clear Time (g_c+I1), s	3.5	25.2	4.5	12.5	15.2	18.8	3.5	4.2
Green Ext Time (p_c), s	0.0	15.4	0.0	0.7	0.8	7.2	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	22.5
HCM 6th LOS	C

Notes

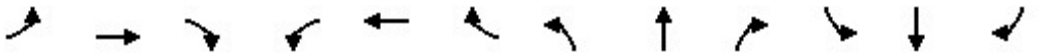
User approved changes to right turn type.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			236			236			236			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



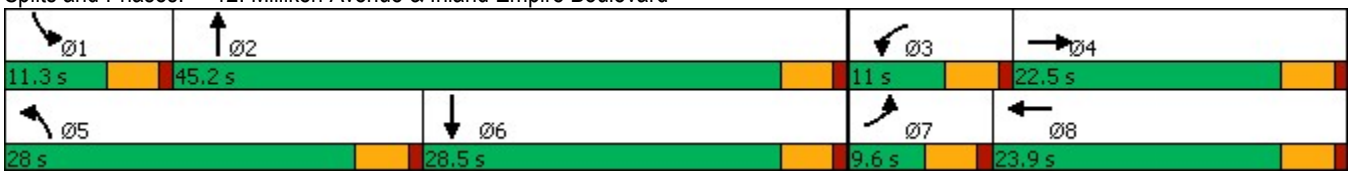
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	63	33	52	99	78	20	406	1085	110	32	894	130
Future Volume (vph)	63	33	52	99	78	20	406	1085	110	32	894	130
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	73	38	60	115	91	23	472	1262	128	37	1040	151
Shared Lane Traffic (%)												
Lane Group Flow (vph)	73	38	60	115	91	23	472	1262	128	37	1040	151

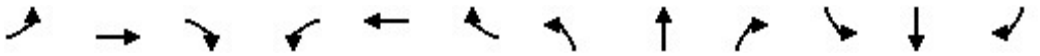
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	33	52	99	78	20	406	1085	110	32	894	130
Future Volume (vph)	63	33	52	99	78	20	406	1085	110	32	894	130
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.6	22.5		11.0	23.9		28.0	45.2		11.3	28.5	
Total Split (%)	10.7%	25.0%		12.2%	26.6%		31.1%	50.2%		12.6%	31.7%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	5.8	7.0	62.8	9.0	8.0	62.8	16.4	38.2	62.8	6.9	20.5	62.8
Actuated g/C Ratio	0.09	0.11	1.00	0.14	0.13	1.00	0.26	0.61	1.00	0.11	0.33	1.00
v/c Ratio	0.28	0.10	0.04	0.28	0.21	0.02	0.63	0.34	0.09	0.12	0.52	0.10
Control Delay	35.7	31.6	0.1	32.8	31.2	0.0	26.8	10.2	0.1	32.4	20.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	31.6	0.1	32.8	31.2	0.0	26.8	10.2	0.1	32.4	20.2	0.1
LOS	D	C	A	C	C	A	C	B	A	C	C	A
Approach Delay		22.3			28.8			13.7			18.1	
Approach LOS		C			C			B			B	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 62.8		
Natural Cycle: 70		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.63		
Intersection Signal Delay: 16.7	Intersection LOS: B	
Intersection Capacity Utilization 48.7%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	73	38	60	115	91	23	472	1262	128	37	1040	151
v/c Ratio	0.28	0.10	0.04	0.28	0.21	0.02	0.63	0.34	0.09	0.12	0.52	0.10
Control Delay	35.7	31.6	0.1	32.8	31.2	0.0	26.8	10.2	0.1	32.4	20.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	31.6	0.1	32.8	31.2	0.0	26.8	10.2	0.1	32.4	20.2	0.1
Queue Length 50th (ft)	15	7	0	24	18	0	92	100	0	7	104	0
Queue Length 95th (ft)	36	22	0	51	41	0	140	125	0	22	147	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	265	1088	1500	428	1172	1500	1225	4022	1500	354	2627	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.03	0.04	0.27	0.08	0.02	0.39	0.31	0.09	0.10	0.40	0.10

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	33	52	99	78	20	406	1085	110	32	894	130
Future Volume (veh/h)	63	33	52	99	78	20	406	1085	110	32	894	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	73	38	0	115	91	0	472	1262	0	37	1040	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	178	293		219	340		626	2869		114	1798	
Arrive On Green	0.06	0.09	0.00	0.08	0.10	0.00	0.21	0.47	0.00	0.04	0.29	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	73	38	0	115	91	0	472	1262	0	37	1040	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	1.3	0.6	0.0	2.1	1.4	0.0	8.3	7.6	0.0	0.7	8.0	0.0
Cycle Q Clear(g_c), s	1.3	0.6	0.0	2.1	1.4	0.0	8.3	7.6	0.0	0.7	8.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	178	293		219	340		626	2869		114	1798	
V/C Ratio(X)	0.41	0.13		0.52	0.27		0.75	0.44		0.32	0.58	
Avail Cap(c_a), veh/h	270	1104		345	1190		1246	4519		360	2665	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.8	23.1	0.0	24.4	22.8	0.0	20.2	9.7	0.0	25.7	16.5	0.0
Incr Delay (d2), s/veh	1.5	0.2	0.0	1.9	0.4	0.0	1.9	0.1	0.0	1.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.2	0.0	0.7	0.5	0.0	2.7	2.1	0.0	0.2	2.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.3	23.3	0.0	26.4	23.2	0.0	22.1	9.8	0.0	27.3	16.7	0.0
LnGrp LOS	C	C		C	C		C	A		C	B	
Approach Vol, veh/h		111	A		206	A		1734	A		1077	A
Approach Delay, s/veh		25.3			25.0			13.1			17.1	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.7	30.3	8.6	9.3	16.3	20.7	7.9	10.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.8	40.7	6.5	18.0	23.5	24.0	5.1	19.4
Max Q Clear Time (g_c+I1), s	2.7	9.6	4.1	2.6	10.3	10.0	3.3	3.4
Green Ext Time (p_c), s	0.0	11.3	0.1	0.1	1.5	6.2	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	15.7
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.943	0.850				
Flt Protected	0.970					
Satd. Flow (prot)	2958	1365	6071	0	0	6071
Flt Permitted	0.970					
Satd. Flow (perm)	2958	1365	6071	0	0	6071
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	1	1				
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	496	679	2619	0	0	1538
Future Volume (vph)	496	679	2619	0	0	1538
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	545	746	2878	0	0	1690
Shared Lane Traffic (%)		45%				
Lane Group Flow (vph)	881	410	2878	0	0	1690

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	496	679	2619	1538
Future Volume (vph)	496	679	2619	1538
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	43.0	43.0	77.0	77.0
Total Split (%)	35.8%	35.8%	64.2%	64.2%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	37.6	37.6	72.5	72.5
Actuated g/C Ratio	0.32	0.32	0.61	0.61
v/c Ratio	0.94	0.95	0.78	0.46
Control Delay	58.7	73.4	19.4	13.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	58.7	73.4	19.4	13.2
LOS	E	E	B	B
Approach Delay	63.4		19.4	13.2
Approach LOS	E		B	B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.1	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 27.3	Intersection LOS: C
Intersection Capacity Utilization 80.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	881	410	2878	1690
v/c Ratio	0.94	0.95	0.78	0.46
Control Delay	58.7	73.4	19.4	13.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	58.7	73.4	19.4	13.2
Queue Length 50th (ft)	338	337	459	196
Queue Length 95th (ft)	#464	#558	505	223
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	957	442	3696	3696
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.92	0.93	0.78	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

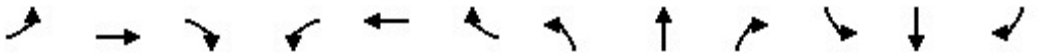
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	496	679	2619	0	0	1538
Future Volume (veh/h)	496	679	2619	0	0	1538
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1673	1772	1772	0	0	1772
Adj Flow Rate, veh/h	430	869	2878	0	0	1690
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	504	949	3692	0	0	3692
Arrive On Green	0.32	0.32	0.61	0.00	0.00	0.61
Sat Flow, veh/h	1594	3003	6592	0	0	6592
Grp Volume(v), veh/h	430	869	2878	0	0	1690
Grp Sat Flow(s),veh/h/ln	1594	1502	1524	0	0	1524
Q Serve(g_s), s	29.1	32.0	40.6	0.0	0.0	17.4
Cycle Q Clear(g_c), s	29.1	32.0	40.6	0.0	0.0	17.4
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	504	949	3692	0	0	3692
V/C Ratio(X)	0.85	0.92	0.78	0.00	0.00	0.46
Avail Cap(c_a), veh/h	533	1005	3841	0	0	3841
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	36.8	37.9	16.9	0.0	0.0	12.4
Incr Delay (d2), s/veh	12.2	12.2	1.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.9	13.2	13.5	0.0	0.0	5.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	49.1	50.1	18.0	0.0	0.0	12.5
LnGrp LOS	D	D	B	A	A	B
Approach Vol, veh/h	1299		2878			1690
Approach Delay, s/veh	49.8		18.0			12.5
Approach LOS	D		B			B

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	74.2			74.2	40.9
Change Period (Y+Rc), s	4.5			4.5	4.5
Max Green Setting (Gmax), s	72.5			72.5	38.5
Max Q Clear Time (g_c+I1), s	42.6			19.4	34.0
Green Ext Time (p_c), s	27.1			21.0	2.3

Intersection Summary	
HCM 6th Ctrl Delay	23.4
HCM 6th LOS	C

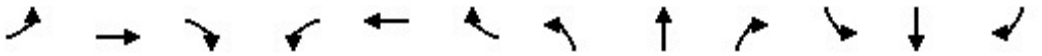
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			266			182			338			235
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



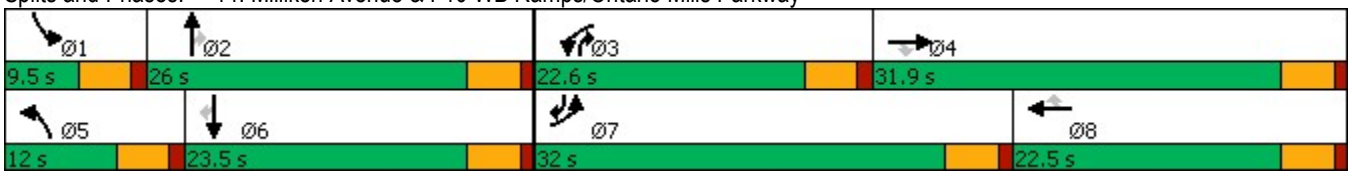
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	617	89	237	162	185	34	154	899	301	83	616	253
Future Volume (vph)	617	89	237	162	185	34	154	899	301	83	616	253
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	693	100	266	182	208	38	173	1010	338	93	692	284
Shared Lane Traffic (%)												
Lane Group Flow (vph)	693	100	266	182	208	38	173	1010	338	93	692	284

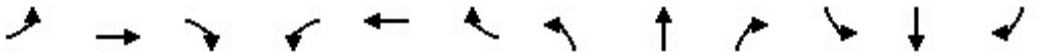
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	617	89	237	162	185	34	154	899	301	83	616	253
Future Volume (vph)	617	89	237	162	185	34	154	899	301	83	616	253
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	32.0	31.9	31.9	22.6	22.5	22.5	12.0	26.0	22.6	9.5	23.5	32.0
Total Split (%)	35.6%	35.4%	35.4%	25.1%	25.0%	25.0%	13.3%	28.9%	25.1%	10.6%	26.1%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	23.1	22.9	22.9	10.4	10.2	10.2	7.6	21.9	36.9	5.1	16.9	44.6
Actuated g/C Ratio	0.30	0.30	0.30	0.14	0.13	0.13	0.10	0.29	0.48	0.07	0.22	0.59
v/c Ratio	0.79	0.19	0.42	0.46	0.46	0.11	0.60	0.58	0.38	0.48	0.51	0.29
Control Delay	32.2	21.9	5.3	35.6	35.4	0.6	45.5	26.5	3.0	46.4	28.1	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	21.9	5.3	35.6	35.4	0.6	45.5	26.5	3.0	46.4	28.1	2.6
LOS	C	C	A	D	D	A	D	C	A	D	C	A
Approach Delay		24.5			32.4			23.4			22.9	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 76.1	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 24.5	Intersection LOS: C
Intersection Capacity Utilization 59.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway

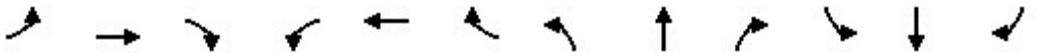




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	693	100	266	182	208	38	173	1010	338	93	692	284
v/c Ratio	0.79	0.19	0.42	0.46	0.46	0.11	0.60	0.58	0.38	0.48	0.51	0.29
Control Delay	32.2	21.9	5.3	35.6	35.4	0.6	45.5	26.5	3.0	46.4	28.1	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	21.9	5.3	35.6	35.4	0.6	45.5	26.5	3.0	46.4	28.1	2.6
Queue Length 50th (ft)	159	36	0	43	51	0	43	127	0	23	86	9
Queue Length 95th (ft)	229	76	51	74	85	0	#88	175	41	#52	123	40
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	1063	646	718	699	807	499	290	1773	1022	193	1543	1057
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.15	0.37	0.26	0.26	0.08	0.60	0.57	0.33	0.48	0.45	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	617	89	237	162	185	34	154	899	301	83	616	253
Future Volume (veh/h)	617	89	237	162	185	34	154	899	301	83	616	253
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	693	100	266	182	208	38	173	1010	338	93	692	284
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	829	524	444	273	352	157	249	1703	560	179	1558	811
Arrive On Green	0.28	0.30	0.30	0.09	0.10	0.10	0.09	0.28	0.28	0.06	0.26	0.26
Sat Flow, veh/h	2910	1772	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	693	100	266	182	208	38	173	1010	338	93	692	284
Grp Sat Flow(s),veh/h/ln	1455	1772	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	14.9	2.8	10.1	4.0	3.9	1.6	3.9	9.6	12.2	2.1	6.4	7.2
Cycle Q Clear(g_c), s	14.9	2.8	10.1	4.0	3.9	1.6	3.9	9.6	12.2	2.1	6.4	7.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	829	524	444	273	352	157	249	1703	560	179	1558	811
V/C Ratio(X)	0.84	0.19	0.60	0.67	0.59	0.24	0.70	0.59	0.60	0.52	0.44	0.35
Avail Cap(c_a), veh/h	1199	727	616	789	908	405	327	1963	624	218	1735	855
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.4	17.5	20.1	29.2	28.5	27.5	29.7	20.8	16.9	30.4	20.9	8.7
Incr Delay (d2), s/veh	3.6	0.2	1.3	2.8	1.6	0.8	4.2	0.4	1.4	2.3	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	1.1	3.4	1.5	1.6	0.6	1.4	3.2	4.0	0.8	2.2	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.0	17.7	21.4	32.1	30.1	28.2	33.9	21.1	18.3	32.7	21.1	9.0
LnGrp LOS	C	B	C	C	C	C	C	C	B	C	C	A
Approach Vol, veh/h		1059			428			1521			1069	
Approach Delay, s/veh		24.1			30.8			22.0			18.9	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	23.2	10.8	24.2	10.2	21.6	23.5	11.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	21.5	18.1	27.4	7.5	19.0	27.5	18.0
Max Q Clear Time (g_c+I1), s	4.1	14.2	6.0	12.1	5.9	9.2	16.9	5.9
Green Ext Time (p_c), s	0.0	4.5	0.4	1.3	0.1	4.1	2.1	1.0

Intersection Summary	
HCM 6th Ctrl Delay	22.6
HCM 6th LOS	C

Notes

User approved changes to right turn type.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.993	0.850				
Flt Protected	0.954					
Satd. Flow (prot)	3063	1365	0	6071	6071	0
Flt Permitted	0.954					
Satd. Flow (perm)	3063	1365	0	6071	6071	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	3	3				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

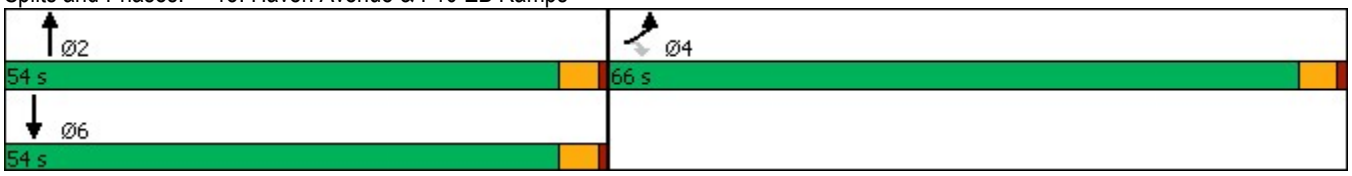
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	1253	583	0	1695	1526	0
Future Volume (vph)	1253	583	0	1695	1526	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1408	655	0	1904	1715	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	1474	589	0	1904	1715	0

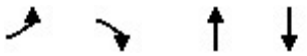
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1253	583	1695	1526
Future Volume (vph)	1253	583	1695	1526
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	66.0	66.0	54.0	54.0
Total Split (%)	55.0%	55.0%	45.0%	45.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	59.4	59.4	48.2	48.2
Actuated g/C Ratio	0.51	0.51	0.41	0.41
v/c Ratio	0.94	0.85	0.76	0.68
Control Delay	40.5	37.9	31.9	29.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	40.5	37.9	31.9	29.9
LOS	D	D	C	C
Approach Delay	39.7		31.9	29.9
Approach LOS	D		C	C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 116.6	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 34.2	Intersection LOS: C
Intersection Capacity Utilization 80.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1474	589	1904	1715
v/c Ratio	0.94	0.85	0.76	0.68
Control Delay	40.5	37.9	31.9	29.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	40.5	37.9	31.9	29.9
Queue Length 50th (ft)	532	413	361	311
Queue Length 95th (ft)	#693	#651	401	348
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	1622	724	2586	2586
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.91	0.81	0.74	0.66

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1253	583	0	1695	1526	0
Future Volume (veh/h)	1253	583	0	1695	1526	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1772	0	1772	1772	0
Adj Flow Rate, veh/h	1408	655	0	1904	1715	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	1594	751	0	2530	2530	0
Arrive On Green	0.50	0.50	0.00	0.42	0.42	0.00
Sat Flow, veh/h	3188	1502	0	6592	6592	0
Grp Volume(v), veh/h	1408	655	0	1904	1715	0
Grp Sat Flow(s),veh/h/ln	1594	1502	0	1524	1524	0
Q Serve(g_s), s	41.9	41.0	0.0	28.1	24.3	0.0
Cycle Q Clear(g_c), s	41.9	41.0	0.0	28.1	24.3	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	1594	751	0	2530	2530	0
V/C Ratio(X)	0.88	0.87	0.00	0.75	0.68	0.00
Avail Cap(c_a), veh/h	1851	872	0	2848	2848	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.7	23.5	0.0	26.4	25.2	0.0
Incr Delay (d2), s/veh	4.9	8.7	0.0	1.0	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.0	15.5	0.0	10.1	8.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.6	32.2	0.0	27.4	25.8	0.0
LnGrp LOS	C	C	A	C	C	A
Approach Vol, veh/h	2063			1904	1715	
Approach Delay, s/veh	29.7			27.4	25.8	
Approach LOS	C			C	C	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	48.5	57.5	48.5
Change Period (Y+Rc), s	4.5	4.5	4.5
Max Green Setting (Gmax), s	49.5	61.5	49.5
Max Q Clear Time (g_c+I1), s	30.1	43.9	26.3
Green Ext Time (p_c), s	13.8	9.1	14.2

Intersection Summary	
HCM 6th Ctrl Delay	27.8
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1600	1800	1600	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2891	1500	2891	6071	6071	1500
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2891	1500	2891	6071	6071	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		6				333
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	654	587	159	703	737	290
Future Volume (vph)	654	587	159	703	737	290
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	752	675	183	808	847	333
Shared Lane Traffic (%)						
Lane Group Flow (vph)	752	675	183	808	847	333

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	654	587	159	703	737	290
Future Volume (vph)	654	587	159	703	737	290
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	38.0	27.0	27.0	52.0	25.0	38.0
Total Split (%)	42.2%	30.0%	30.0%	57.8%	27.8%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	23.9	40.9	12.2	33.8	16.9	45.5
Actuated g/C Ratio	0.36	0.61	0.18	0.50	0.25	0.68
v/c Ratio	0.73	0.74	0.35	0.26	0.56	0.30
Control Delay	24.5	15.1	27.7	10.2	24.9	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.5	15.1	27.7	10.2	24.9	1.4
LOS	C	B	C	B	C	A
Approach Delay	20.1			13.4	18.2	
Approach LOS	C			B	B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 67.2	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 17.6	Intersection LOS: B
Intersection Capacity Utilization 57.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

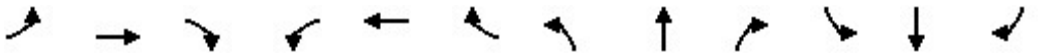
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	752	675	183	808	847	333
v/c Ratio	0.73	0.74	0.35	0.26	0.56	0.30
Control Delay	24.5	15.1	27.7	10.2	24.9	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.5	15.1	27.7	10.2	24.9	1.4
Queue Length 50th (ft)	129	172	34	50	84	0
Queue Length 95th (ft)	237	295	69	84	153	24
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	1515	1168	1017	4503	1946	1309
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.58	0.18	0.18	0.44	0.25

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	654	587	159	703	737	290
Future Volume (veh/h)	654	587	159	703	737	290
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1772	1575	1772	1772	1772
Adj Flow Rate, veh/h	752	675	183	808	847	333
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1330	831	280	2451	1435	1040
Arrive On Green	0.46	0.46	0.10	0.40	0.24	0.24
Sat Flow, veh/h	2910	1502	2910	6343	6343	1502
Grp Volume(v), veh/h	752	675	183	808	847	333
Grp Sat Flow(s),veh/h/ln	1455	1502	1455	1524	1524	1502
Q Serve(g_s), s	12.1	23.3	3.9	5.8	7.9	5.6
Cycle Q Clear(g_c), s	12.1	23.3	3.9	5.8	7.9	5.6
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1330	831	280	2451	1435	1040
V/C Ratio(X)	0.57	0.81	0.65	0.33	0.59	0.32
Avail Cap(c_a), veh/h	1526	932	1025	4532	1956	1168
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.7	11.6	27.8	13.2	21.7	3.9
Incr Delay (d2), s/veh	0.4	5.0	2.6	0.1	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	18.5	1.4	1.8	2.7	4.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.1	16.6	30.4	13.2	22.1	4.1
LnGrp LOS	B	B	C	B	C	A
Approach Vol, veh/h	1427			991	1180	
Approach Delay, s/veh	14.8			16.4	17.0	
Approach LOS	B			B	B	

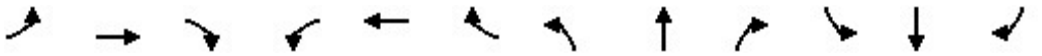
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		30.2		33.7	10.6	19.5
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		47.5		33.5	22.5	20.5
Max Q Clear Time (g_c+I1), s		7.8		25.3	5.9	9.9
Green Ext Time (p_c), s		6.8		3.9	0.5	5.2

Intersection Summary	
HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.965				0.850			0.850		0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4649	0	2891	3353	1500	2891	4818	1500	2891	5888	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4649	0	2891	3353	1500	2891	4818	1500	2891	5888	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		64				136			177		65	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	364	702	216	160	600	127	252	1527	193	176	1469	370
Future Volume (vph)	364	702	216	160	600	127	252	1527	193	176	1469	370
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	396	763	235	174	652	138	274	1660	210	191	1597	402
Shared Lane Traffic (%)												
Lane Group Flow (vph)	396	998	0	174	652	138	274	1660	210	191	1999	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	364	702	160	600	127	252	1527	193	176	1469
Future Volume (vph)	364	702	160	600	127	252	1527	193	176	1469
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	22.0	37.0	14.0	29.0	29.0	14.0	57.0		12.0	55.0
Total Split (%)	18.3%	30.8%	11.7%	24.2%	24.2%	11.7%	47.5%		10.0%	45.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	17.5	32.6	9.4	24.5	24.5	9.5	52.5	120.0	7.5	50.5
Actuated g/C Ratio	0.15	0.27	0.08	0.20	0.20	0.08	0.44	1.00	0.06	0.42
v/c Ratio	0.94	0.76	0.77	0.95	0.33	1.20	0.79	0.14	1.06	0.79
Control Delay	82.3	42.0	76.5	72.2	9.2	171.6	32.4	0.2	137.6	32.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.3	42.0	76.5	72.2	9.2	171.6	32.4	0.2	137.6	32.1
LOS	F	D	E	E	A	F	C	A	F	C
Approach Delay		53.4		63.9			47.0			41.3
Approach LOS		D		E			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 48.9	Intersection LOS: D
Intersection Capacity Utilization 82.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Haven Avenue & 4th Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	396	998	174	652	138	274	1660	210	191	1999
v/c Ratio	0.94	0.76	0.77	0.95	0.33	1.20	0.79	0.14	1.06	0.79
Control Delay	82.3	42.0	76.5	72.2	9.2	171.6	32.4	0.2	137.6	32.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.3	42.0	76.5	72.2	9.2	171.6	32.4	0.2	137.6	32.1
Queue Length 50th (ft)	158	245	69	264	1	~132	396	0	~83	374
Queue Length 95th (ft)	#255	299	#124	#383	55	#221	458	0	#160	423
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	421	1308	228	684	414	228	2107	1500	180	2515
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.76	0.76	0.95	0.33	1.20	0.79	0.14	1.06	0.79

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

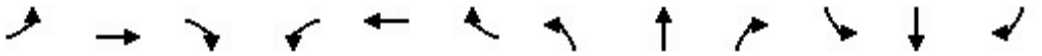
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	364	702	216	160	600	127	252	1527	193	176	1469	370
Future Volume (veh/h)	364	702	216	160	600	127	252	1527	193	176	1469	370
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	396	763	235	174	652	138	274	1660	0	191	1597	402
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	424	1009	308	220	687	307	230	2116		182	2058	518
Arrive On Green	0.15	0.27	0.27	0.08	0.20	0.20	0.08	0.44	0.00	0.06	0.42	0.42
Sat Flow, veh/h	2910	3675	1120	2910	3367	1502	2910	4837	1502	2910	4891	1231
Grp Volume(v), veh/h	396	669	329	174	652	138	274	1660	0	191	1493	506
Grp Sat Flow(s),veh/h/ln	1455	1612	1570	1455	1683	1502	1455	1612	1502	1455	1524	1550
Q Serve(g_s), s	16.1	22.8	23.1	7.1	22.9	9.7	9.5	35.3	0.0	7.5	33.7	33.7
Cycle Q Clear(g_c), s	16.1	22.8	23.1	7.1	22.9	9.7	9.5	35.3	0.0	7.5	33.7	33.7
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		0.79
Lane Grp Cap(c), veh/h	424	885	431	220	687	307	230	2116		182	1924	652
V/C Ratio(X)	0.93	0.76	0.76	0.79	0.95	0.45	1.19	0.78		1.05	0.78	0.78
Avail Cap(c_a), veh/h	424	885	431	230	687	307	230	2116		182	1924	652
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.7	39.8	40.0	54.6	47.1	41.8	55.3	28.9	0.0	56.3	29.9	29.9
Incr Delay (d2), s/veh	27.6	3.7	7.9	16.4	22.5	1.0	120.0	3.0	0.0	80.6	3.1	8.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	9.4	9.8	3.1	11.7	3.7	7.3	13.9	0.0	4.8	12.7	13.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.3	43.6	47.9	71.0	69.6	42.9	175.3	31.9	0.0	136.8	33.0	38.7
LnGrp LOS	E	D	D	E	E	D	F	C		F	C	D
Approach Vol, veh/h		1394			964			1934	A		2190	
Approach Delay, s/veh		54.5			66.0			52.2			43.4	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	57.0	13.6	37.4	14.0	55.0	22.0	29.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	52.5	9.5	32.5	9.5	50.5	17.5	24.5
Max Q Clear Time (g_c+I1), s	9.5	37.3	9.1	25.1	11.5	35.7	18.1	24.9
Green Ext Time (p_c), s	0.0	10.3	0.0	3.8	0.0	11.3	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	51.8
HCM 6th LOS	D

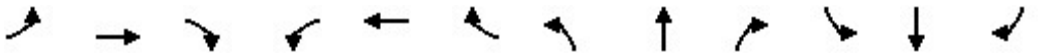
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.995				0.850			0.850		0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	6040	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	6040	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9				127			200		182	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	4	1801	65	1	1111	15	64	0	9	47	0	12
Future Volume (vph)	4	1801	65	1	1111	15	64	0	9	47	0	12
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	4	1896	68	1	1169	16	67	0	9	49	0	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	1964	0	1	1169	16	67	0	9	49	13	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	4	1801	1	1111	15	64	9	47	0
Future Volume (vph)	4	1801	1	1111	15	64	9	47	0
Turn Type	Prot	NA	Prot	NA	Perm	Prot	Perm	Prot	NA
Protected Phases	7	4	3	8		5		1	6
Permitted Phases					8		2		
Detector Phase	7	4	3	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.5	42.4	9.5	42.4	42.4	11.8	23.7	14.4	26.3
Total Split (%)	10.6%	47.1%	10.6%	47.1%	47.1%	13.1%	26.3%	16.0%	29.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.2	36.1	5.2	36.1	36.1	7.1	5.8	7.5	6.4
Actuated g/C Ratio	0.09	0.61	0.09	0.61	0.61	0.12	0.10	0.13	0.11
v/c Ratio	0.03	0.54	0.01	0.40	0.02	0.36	0.03	0.24	0.03
Control Delay	31.8	9.0	31.0	8.1	0.0	34.5	0.1	30.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.8	9.0	31.0	8.1	0.0	34.5	0.1	30.7	0.1
LOS	C	A	C	A	A	C	A	C	A
Approach Delay		9.0		8.0					24.3
Approach LOS		A		A					C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 59.6	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 9.4	Intersection LOS: A
Intersection Capacity Utilization 48.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street

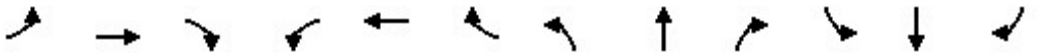
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	4	1964	1	1169	16	67	9	49	13
v/c Ratio	0.03	0.54	0.01	0.40	0.02	0.36	0.03	0.24	0.03
Control Delay	31.8	9.0	31.0	8.1	0.0	34.5	0.1	30.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.8	9.0	31.0	8.1	0.0	34.5	0.1	30.7	0.1
Queue Length 50th (ft)	2	119	0	79	0	25	0	18	0
Queue Length 95th (ft)	11	228	5	163	0	69	0	52	0
Internal Link Dist (ft)		2546		362					358
Turn Bay Length (ft)	130		130		145	165	165	50	
Base Capacity (vph)	139	4033	139	3215	1043	203	639	276	1206
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.49	0.01	0.36	0.02	0.33	0.01	0.18	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1801	65	1	1111	15	64	0	9	47	0	12
Future Volume (veh/h)	4	1801	65	1	1111	15	64	0	9	47	0	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	4	1896	68	1	1169	16	67	0	9	49	0	13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	9	3225	116	3	2544	790	92	176	149	76	150	134
Arrive On Green	0.01	0.53	0.53	0.00	0.53	0.53	0.06	0.00	0.10	0.05	0.00	0.09
Sat Flow, veh/h	1594	6086	218	1594	4837	1502	1594	1772	1502	1594	1683	1502
Grp Volume(v), veh/h	4	1424	540	1	1169	16	67	0	9	49	0	13
Grp Sat Flow(s),veh/h/ln	1594	1524	1733	1594	1612	1502	1594	1772	1502	1594	1683	1502
Q Serve(g_s), s	0.1	11.9	11.9	0.0	8.5	0.3	2.3	0.0	0.3	1.7	0.0	0.4
Cycle Q Clear(g_c), s	0.1	11.9	11.9	0.0	8.5	0.3	2.3	0.0	0.3	1.7	0.0	0.4
Prop In Lane	1.00		0.13	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	9	2422	918	3	2544	790	92	176	149	76	150	134
V/C Ratio(X)	0.47	0.59	0.59	0.35	0.46	0.02	0.73	0.00	0.06	0.65	0.00	0.10
Avail Cap(c_a), veh/h	142	3095	1173	142	3275	1017	208	608	515	282	656	585
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.8	9.0	9.0	27.9	8.3	6.4	25.9	0.0	22.8	26.2	0.0	23.4
Incr Delay (d2), s/veh	34.6	0.2	0.6	61.1	0.1	0.0	10.4	0.0	0.2	8.8	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.1	3.6	0.1	2.3	0.1	1.1	0.0	0.1	0.8	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.3	9.2	9.6	89.0	8.4	6.4	36.3	0.0	23.0	35.0	0.0	23.7
LnGrp LOS	E	A	A	F	A	A	D	A	C	D	A	C
Approach Vol, veh/h		1968			1186			76			62	
Approach Delay, s/veh		9.4			8.5			34.7			32.7	
Approach LOS		A			A			C			C	

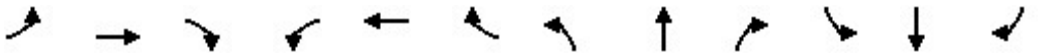
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.2	10.1	4.6	34.2	7.7	9.5	4.8	33.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.9	19.2	5.0	37.9	7.3	21.8	5.0	37.9
Max Q Clear Time (g_c+I1), s	3.7	2.3	2.0	13.9	4.3	2.4	2.1	10.5
Green Ext Time (p_c), s	0.0	0.0	0.0	15.8	0.0	0.0	0.0	9.9

Intersection Summary	
HCM 6th Ctrl Delay	10.1
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.995				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.953	
Satd. Flow (prot)	2891	6065	0	1583	4794	0	1583	1765	1500	0	1682	1500
Flt Permitted	0.950			0.950			0.727				0.731	
Satd. Flow (perm)	2891	6065	0	1583	4794	0	1212	1765	1500	0	1290	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			10				154			94
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



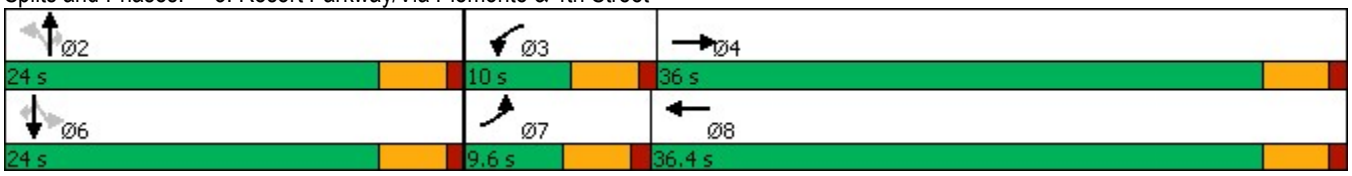
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	29	1818	8	65	1086	38	36	0	45	43	1	20
Future Volume (vph)	29	1818	8	65	1086	38	36	0	45	43	1	20
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	31	1914	8	68	1143	40	38	0	47	45	1	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	1922	0	68	1183	0	38	0	47	0	46	21

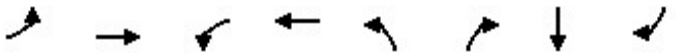
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	29	1818	65	1086	36	45	43	1	20
Future Volume (vph)	29	1818	65	1086	36	45	43	1	20
Turn Type	Prot	NA	Prot	NA	Perm	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8				6	
Permitted Phases					2	2	6		6
Detector Phase	7	4	3	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.6	36.0	10.0	36.4	24.0	24.0	24.0	24.0	24.0
Total Split (%)	13.7%	51.4%	14.3%	52.0%	34.3%	34.3%	34.3%	34.3%	34.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min
Act Effct Green (s)	5.3	30.2	5.7	32.2	7.4	7.4		7.4	7.4
Actuated g/C Ratio	0.10	0.58	0.11	0.62	0.14	0.14		0.14	0.14
v/c Ratio	0.11	0.55	0.40	0.40	0.22	0.14		0.25	0.07
Control Delay	26.0	8.5	33.0	6.5	25.6	0.8		26.0	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	26.0	8.5	33.0	6.5	25.6	0.8		26.0	0.5
LOS	C	A	C	A	C	A		C	A
Approach Delay		8.8		7.9				18.0	
Approach LOS		A		A				B	

Intersection Summary			
Cycle Length: 70			
Actuated Cycle Length: 52.3			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 8.7		Intersection LOS: A	
Intersection Capacity Utilization 52.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street





Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBT	SBR
Lane Group Flow (vph)	31	1922	68	1183	38	47	46	21
v/c Ratio	0.11	0.55	0.40	0.40	0.22	0.14	0.25	0.07
Control Delay	26.0	8.5	33.0	6.5	25.6	0.8	26.0	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	8.5	33.0	6.5	25.6	0.8	26.0	0.5
Queue Length 50th (ft)	5	115	23	40	12	0	15	0
Queue Length 95th (ft)	17	163	#66	119	35	0	41	0
Internal Link Dist (ft)		362		428			378	
Turn Bay Length (ft)	220		125		115	115		110
Base Capacity (vph)	291	3777	172	3185	467	673	497	636
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.51	0.40	0.37	0.08	0.07	0.09	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	1818	8	65	1086	38	36	0	45	43	1	20
Future Volume (veh/h)	29	1818	8	65	1086	38	36	0	45	43	1	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	31	1914	8	68	1143	40	38	0	47	45	1	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	103	3397	14	100	2714	95	256	191	162	296	5	162
Arrive On Green	0.04	0.54	0.54	0.06	0.57	0.57	0.11	0.00	0.11	0.11	0.11	0.11
Sat Flow, veh/h	2910	6312	26	1594	4799	168	1312	1772	1502	1324	45	1502
Grp Volume(v), veh/h	31	1386	536	68	768	415	38	0	47	46	0	21
Grp Sat Flow(s),veh/h/ln	1455	1524	1767	1594	1612	1742	1312	1772	1502	1369	0	1502
Q Serve(g_s), s	0.5	9.3	9.3	1.9	6.3	6.3	1.3	0.0	1.3	1.4	0.0	0.6
Cycle Q Clear(g_c), s	0.5	9.3	9.3	1.9	6.3	6.3	2.7	0.0	1.3	1.4	0.0	0.6
Prop In Lane	1.00		0.01	1.00		0.10	1.00		1.00	0.98		1.00
Lane Grp Cap(c), veh/h	103	2460	951	100	1824	985	256	191	162	301	0	162
V/C Ratio(X)	0.30	0.56	0.56	0.68	0.42	0.42	0.15	0.00	0.29	0.15	0.00	0.13
Avail Cap(c_a), veh/h	320	3105	1200	189	2218	1198	667	745	631	728	0	631
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.8	7.1	7.1	21.3	5.7	5.7	20.3	0.0	19.1	19.1	0.0	18.7
Incr Delay (d2), s/veh	1.6	0.2	0.5	7.8	0.2	0.3	0.3	0.0	1.0	0.2	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.1	2.5	0.9	1.4	1.6	0.4	0.0	0.5	0.4	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.4	7.3	7.6	29.0	5.9	6.0	20.6	0.0	20.0	19.3	0.0	19.1
LnGrp LOS	C	A	A	C	A	A	C	A	C	B	A	B
Approach Vol, veh/h		1953			1251			85			67	
Approach Delay, s/veh		7.6			7.2			20.3			19.2	
Approach LOS		A			A			C			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	7.4	29.5		9.5	6.1	30.7				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		19.5	5.5	31.5		19.5	5.1	31.9				
Max Q Clear Time (g_c+I1), s		4.7	3.9	11.3		3.4	2.5	8.3				
Green Ext Time (p_c), s		0.2	0.0	13.6		0.2	0.0	8.8				

Intersection Summary	
HCM 6th Ctrl Delay	8.0
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.995					0.865
Flt Protected						
Satd. Flow (prot)	4794	0	0	4818	0	1526
Flt Permitted						
Satd. Flow (perm)	4794	0	0	4818	0	1526
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	1850	63	0	1163	0	52
Future Volume (vph)	1850	63	0	1163	0	52
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1927	66	0	1211	0	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1993	0	0	1211	0	54

Intersection Summary

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1850	63	0	1163	0	52
Future Vol, veh/h	1850	63	0	1163	0	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1927	66	0	1211	0	54

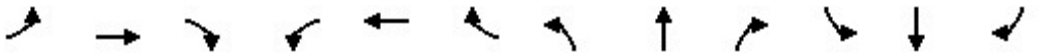
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	997
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	208
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	208
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	28.3
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	208	-	-	-
HCM Lane V/C Ratio	0.26	-	-	-
HCM Control Delay (s)	28.3	-	-	-
HCM Lane LOS	D	-	-	-
HCM 95th %tile Q(veh)	1	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.980	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5949	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5949	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			180			285			55		31	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



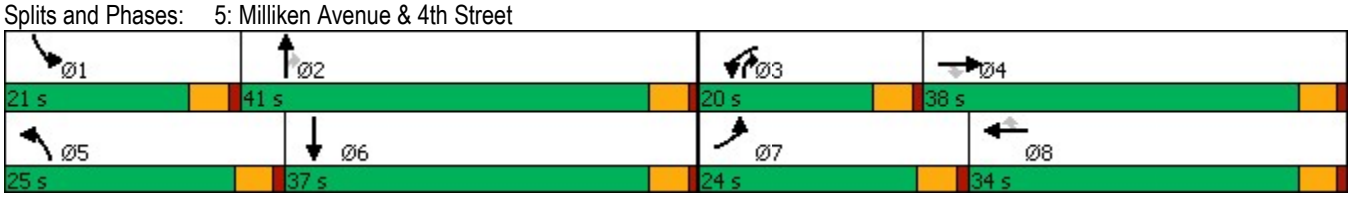
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	436	1121	206	383	906	275	302	1513	377	432	950	144
Future Volume (vph)	436	1121	206	383	906	275	302	1513	377	432	950	144
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	454	1168	215	399	944	286	315	1576	393	450	990	150
Shared Lane Traffic (%)												
Lane Group Flow (vph)	454	1168	215	399	944	286	315	1576	393	450	1140	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	436	1121	206	383	906	275	302	1513	377	432	950
Future Volume (vph)	436	1121	206	383	906	275	302	1513	377	432	950
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	24.0	38.0	38.0	20.0	34.0	34.0	25.0	41.0	20.0	21.0	37.0
Total Split (%)	20.0%	31.7%	31.7%	16.7%	28.3%	28.3%	20.8%	34.2%	16.7%	17.5%	30.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	19.5	33.2	33.2	15.5	29.2	29.2	17.6	36.5	56.5	16.5	35.3
Actuated g/C Ratio	0.16	0.28	0.28	0.13	0.24	0.24	0.15	0.30	0.47	0.14	0.29
v/c Ratio	0.97	0.87	0.39	1.07	0.80	0.49	0.74	0.85	0.53	1.13	0.64
Control Delay	84.0	49.7	10.0	115.1	48.6	7.4	59.6	44.6	22.1	132.4	38.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.0	49.7	10.0	115.1	48.6	7.4	59.6	44.6	22.1	132.4	38.1
LOS	F	D	B	F	D	A	E	D	C	F	D
Approach Delay		53.5			57.7			42.8			64.8
Approach LOS		D			E			D			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.7	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 53.5	Intersection LOS: D
Intersection Capacity Utilization 88.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 5: Milliken Avenue & 4th Street

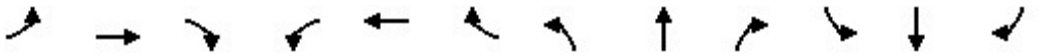


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	454	1168	215	399	944	286	315	1576	393	450	1140
v/c Ratio	0.97	0.87	0.39	1.07	0.80	0.49	0.74	0.85	0.53	1.13	0.64
Control Delay	84.0	49.7	10.0	115.1	48.6	7.4	59.6	44.6	22.1	132.4	38.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.0	49.7	10.0	115.1	48.6	7.4	59.6	44.6	22.1	132.4	38.1
Queue Length 50th (ft)	182	315	20	~176	252	1	121	332	180	~208	218
Queue Length 95th (ft)	#287	375	84	#277	305	71	168	381	276	#314	266
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	470	1348	549	374	1187	584	494	1850	736	398	1778
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.87	0.39	1.07	0.80	0.49	0.64	0.85	0.53	1.13	0.64

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

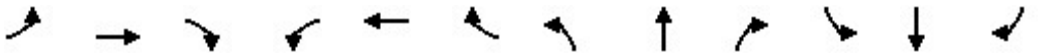
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	436	1121	206	383	906	275	302	1513	377	432	950	144
Future Volume (veh/h)	436	1121	206	383	906	275	302	1513	377	432	950	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	454	1168	215	399	944	286	315	1576	393	450	990	150
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	482	1324	411	383	1160	360	372	1838	650	408	1692	253
Arrive On Green	0.17	0.27	0.27	0.13	0.24	0.24	0.13	0.30	0.30	0.14	0.31	0.31
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	2910	6095	1502	2910	5391	807
Grp Volume(v), veh/h	454	1168	215	399	944	286	315	1576	393	450	838	302
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1455	1524	1502	1455	1524	1627
Q Serve(g_s), s	18.2	27.2	14.3	15.5	21.7	21.1	12.5	28.7	23.7	16.5	18.1	18.4
Cycle Q Clear(g_c), s	18.2	27.2	14.3	15.5	21.7	21.1	12.5	28.7	23.7	16.5	18.1	18.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	482	1324	411	383	1160	360	372	1838	650	408	1435	511
V/C Ratio(X)	0.94	0.88	0.52	1.04	0.81	0.79	0.85	0.86	0.60	1.10	0.58	0.59
Avail Cap(c_a), veh/h	482	1377	427	383	1212	376	507	1890	663	408	1435	511
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.5	40.9	36.2	51.1	42.3	42.0	50.2	38.7	25.6	50.6	33.9	34.0
Incr Delay (d2), s/veh	27.0	6.9	1.1	57.1	4.2	10.8	9.6	4.1	1.5	75.5	0.6	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	11.5	5.4	8.7	9.0	8.8	5.0	11.1	8.6	10.3	6.8	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.6	47.8	37.3	108.2	46.5	52.8	59.8	42.8	27.1	126.1	34.5	35.9
LnGrp LOS	E	D	D	F	D	D	E	D	C	F	C	D
Approach Vol, veh/h		1837			1629			2284			1590	
Approach Delay, s/veh		53.4			62.7			42.5			60.7	
Approach LOS		D			E			D			E	

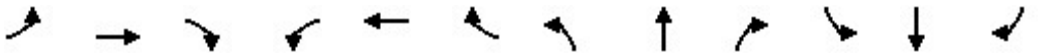
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	40.0	20.0	36.7	19.5	41.4	24.0	32.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	36.5	15.5	33.5	20.5	32.5	19.5	29.5
Max Q Clear Time (g_c+I1), s	18.5	30.7	17.5	29.2	14.5	20.4	20.2	23.7
Green Ext Time (p_c), s	0.0	4.8	0.0	3.0	0.6	6.0	0.0	3.5

Intersection Summary	
HCM 6th Ctrl Delay	53.6
HCM 6th LOS	D



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.925	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2971	1365
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2971	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			130			186			273		200	341
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



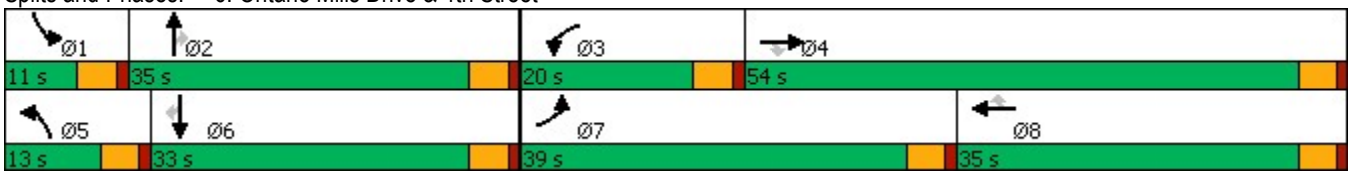
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	956	1263	120	226	991	312	141	310	352	78	312	627
Future Volume (vph)	956	1263	120	226	991	312	141	310	352	78	312	627
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1039	1373	130	246	1077	339	153	337	383	85	339	682
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	1039	1373	130	246	1077	339	153	337	383	85	680	341

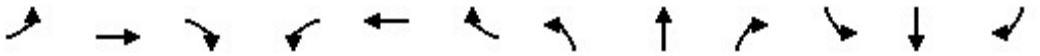
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	956	1263	120	226	991	312	141	310	352	78	312	627
Future Volume (vph)	956	1263	120	226	991	312	141	310	352	78	312	627
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	39.0	54.0	54.0	20.0	35.0	35.0	13.0	35.0	35.0	11.0	33.0	33.0
Total Split (%)	32.5%	45.0%	45.0%	16.7%	29.2%	29.2%	10.8%	29.2%	29.2%	9.2%	27.5%	27.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	34.6	50.7	50.7	14.0	30.1	30.1	8.5	27.7	27.7	6.5	25.7	25.7
Actuated g/C Ratio	0.30	0.43	0.43	0.12	0.26	0.26	0.07	0.24	0.24	0.06	0.22	0.22
v/c Ratio	1.22	0.66	0.18	0.71	0.87	0.65	1.33	0.42	0.68	0.98	0.84	0.60
Control Delay	144.6	28.8	4.3	61.8	50.4	23.7	238.6	39.5	18.4	145.6	40.9	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	144.6	28.8	4.3	61.8	50.4	23.7	238.6	39.5	18.4	145.6	40.9	8.9
LOS	F	C	A	E	D	C	F	D	B	F	D	A
Approach Delay		74.9			46.7			65.2			39.1	
Approach LOS		E			D			E			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 116.9	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.33	
Intersection Signal Delay: 59.5	Intersection LOS: E
Intersection Capacity Utilization 92.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 6: Ontario Mills Drive & 4th Street



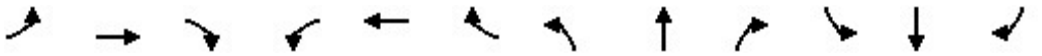


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1039	1373	130	246	1077	339	153	337	383	85	680	341
v/c Ratio	1.22	0.66	0.18	0.71	0.87	0.65	1.33	0.42	0.68	0.98	0.84	0.60
Control Delay	144.6	28.8	4.3	61.8	50.4	23.7	238.6	39.5	18.4	145.6	40.9	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	144.6	28.8	4.3	61.8	50.4	23.7	238.6	39.5	18.4	145.6	40.9	8.9
Queue Length 50th (ft)	~518	314	0	94	294	105	~156	114	71	67	197	0
Queue Length 95th (ft)	#648	369	38	139	#357	213	#293	159	184	#174	275	89
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	854	2089	724	383	1258	529	115	876	593	87	876	591
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.22	0.66	0.18	0.64	0.86	0.64	1.33	0.38	0.65	0.98	0.78	0.58

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



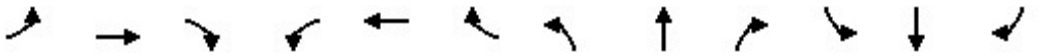
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	956	1263	120	226	991	312	141	310	352	78	312	627
Future Volume (veh/h)	956	1263	120	226	991	312	141	310	352	78	312	627
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	1039	1373	130	246	1077	339	153	337	383	85	339	682
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	841	2115	657	297	1210	376	113	860	384	87	423	717
Arrive On Green	0.29	0.44	0.44	0.10	0.25	0.25	0.07	0.26	0.26	0.05	0.24	0.24
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	1594	3367	1502	1594	1772	3003
Grp Volume(v), veh/h	1039	1373	130	246	1077	339	153	337	383	85	339	682
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1594	1683	1502	1594	1772	1502
Q Serve(g_s), s	34.5	26.6	6.4	9.9	25.6	26.1	8.5	9.9	30.4	6.4	21.5	26.7
Cycle Q Clear(g_c), s	34.5	26.6	6.4	9.9	25.6	26.1	8.5	9.9	30.4	6.4	21.5	26.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	841	2115	657	297	1210	376	113	860	384	87	423	717
V/C Ratio(X)	1.24	0.65	0.20	0.83	0.89	0.90	1.35	0.39	1.00	0.98	0.80	0.95
Avail Cap(c_a), veh/h	841	2115	657	378	1236	384	113	860	384	87	423	717
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.4	26.4	20.7	52.6	43.2	43.3	55.4	36.8	44.4	56.4	42.8	44.7
Incr Delay (d2), s/veh	116.1	0.7	0.1	11.6	8.2	23.5	203.9	0.3	45.4	89.5	10.6	22.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	25.8	10.2	2.3	4.1	11.1	12.1	9.8	4.1	16.0	4.7	10.6	12.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	158.6	27.1	20.8	64.1	51.4	66.9	259.3	37.1	89.8	145.9	53.3	67.1
LnGrp LOS	F	C	C	E	D	E	F	D	F	F	D	E
Approach Vol, veh/h		2542			1662			873			1106	
Approach Delay, s/veh		80.5			56.4			99.2			68.9	
Approach LOS		F			E			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	35.0	16.7	56.7	13.0	33.0	39.0	34.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	30.5	15.5	49.5	8.5	28.5	34.5	30.5
Max Q Clear Time (g_c+I1), s	8.4	32.4	11.9	28.6	10.5	28.7	36.5	28.1
Green Ext Time (p_c), s	0.0	0.0	0.3	10.9	0.0	0.0	0.0	1.8

Intersection Summary	
HCM 6th Ctrl Delay	74.6
HCM 6th LOS	E

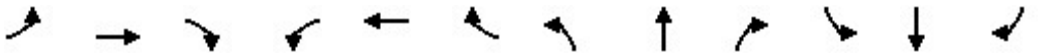
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.973			0.936				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.982	
Satd. Flow (prot)	2891	4818	1500	1583	4688	0	1583	3138	0	1504	1646	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.982	
Satd. Flow (perm)	2891	4818	1500	1583	4688	0	1583	3138	0	1504	1646	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			101		38			60				296
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



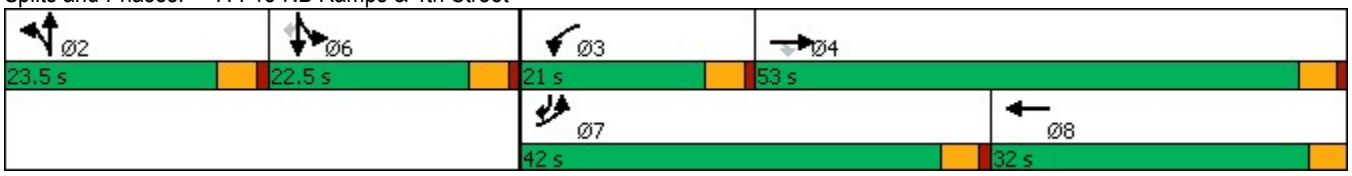
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	861	725	97	79	772	171	119	77	58	144	68	625
Future Volume (vph)	861	725	97	79	772	171	119	77	58	144	68	625
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	897	755	101	82	804	178	124	80	60	150	71	651
Shared Lane Traffic (%)										27%		
Lane Group Flow (vph)	897	755	101	82	982	0	124	140	0	109	112	651

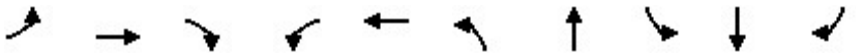
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	861	725	97	79	772	119	77	144	68	625
Future Volume (vph)	861	725	97	79	772	119	77	144	68	625
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	42.0	53.0	53.0	21.0	32.0	23.5	23.5	22.5	22.5	42.0
Total Split (%)	35.0%	44.2%	44.2%	17.5%	26.7%	19.6%	19.6%	18.8%	18.8%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	37.6	55.0	55.0	11.0	26.8	13.6	13.6	12.9	12.9	55.1
Actuated g/C Ratio	0.35	0.51	0.51	0.10	0.25	0.13	0.13	0.12	0.12	0.51
v/c Ratio	0.89	0.31	0.12	0.51	0.83	0.63	0.31	0.61	0.57	0.44
Control Delay	47.1	18.4	4.6	58.9	44.4	60.3	27.5	61.3	58.1	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	18.4	4.6	58.9	44.4	60.3	27.5	61.3	58.1	10.0
LOS	D	B	A	E	D	E	C	E	E	A
Approach Delay		32.3			45.6		42.9		22.5	
Approach LOS		C			D		D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 34.4	Intersection LOS: C
Intersection Capacity Utilization 77.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street

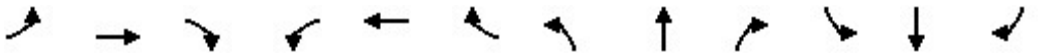




Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	897	755	101	82	982	124	140	109	112	651
v/c Ratio	0.89	0.31	0.12	0.51	0.83	0.63	0.31	0.61	0.57	0.44
Control Delay	47.1	18.4	4.6	58.9	44.4	60.3	27.5	61.3	58.1	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	18.4	4.6	58.9	44.4	60.3	27.5	61.3	58.1	10.0
Queue Length 50th (ft)	309	114	0	56	228	84	26	77	80	81
Queue Length 95th (ft)	#496	184	34	111	315	153	59	146	147	141
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	1012	2454	813	244	1276	281	606	252	276	1495
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.31	0.12	0.34	0.77	0.44	0.23	0.43	0.41	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	861	725	97	79	772	171	119	77	58	144	68	625
Future Volume (veh/h)	861	725	97	79	772	171	119	77	58	144	68	625
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	897	755	101	82	804	178	124	80	60	110	126	651
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	958	2445	759	102	954	210	161	193	132	259	288	1477
Arrive On Green	0.33	0.51	0.51	0.06	0.24	0.24	0.10	0.10	0.10	0.16	0.16	0.16
Sat Flow, veh/h	2910	4837	1502	1594	3968	872	1594	1910	1309	1594	1772	3003
Grp Volume(v), veh/h	897	755	101	82	652	330	124	70	70	110	126	651
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1594	1612	1615	1594	1683	1536	1594	1772	1502
Q Serve(g_s), s	32.3	9.9	3.9	5.5	20.8	21.0	8.2	4.2	4.7	6.7	6.9	15.2
Cycle Q Clear(g_c), s	32.3	9.9	3.9	5.5	20.8	21.0	8.2	4.2	4.7	6.7	6.9	15.2
Prop In Lane	1.00		1.00	1.00		0.54	1.00		0.85	1.00		1.00
Lane Grp Cap(c), veh/h	958	2445	759	102	776	388	161	170	155	259	288	1477
V/C Ratio(X)	0.94	0.31	0.13	0.80	0.84	0.85	0.77	0.41	0.45	0.42	0.44	0.44
Avail Cap(c_a), veh/h	1010	2445	759	243	851	426	280	296	270	266	295	1489
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.1	15.7	14.2	49.9	39.1	39.1	47.3	45.5	45.7	40.7	40.8	17.8
Incr Delay (d2), s/veh	15.0	0.1	0.1	13.3	7.1	13.9	7.5	1.6	2.1	1.1	1.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.2	3.6	1.3	2.6	8.9	9.7	3.6	1.8	1.9	2.7	3.1	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.1	15.7	14.2	63.2	46.1	53.1	54.9	47.1	47.8	41.8	41.8	18.0
LnGrp LOS	D	B	B	E	D	D	D	D	D	D	D	B
Approach Vol, veh/h		1753			1064			264			887	
Approach Delay, s/veh		33.2			49.6			50.9			24.3	
Approach LOS		C			D			D			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		15.4	11.4	59.1		22.1	40.1	30.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		19.0	16.5	48.5		18.0	37.5	* 29				
Max Q Clear Time (g_c+I1), s		10.2	7.5	11.9		17.2	34.3	23.0				
Green Ext Time (p_c), s		0.7	0.1	6.6		0.4	1.3	2.9				

Intersection Summary	
HCM 6th Ctrl Delay	36.8
HCM 6th LOS	D

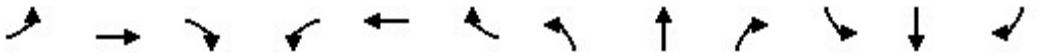
Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.907				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3041	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3041	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		66				149			149			149
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



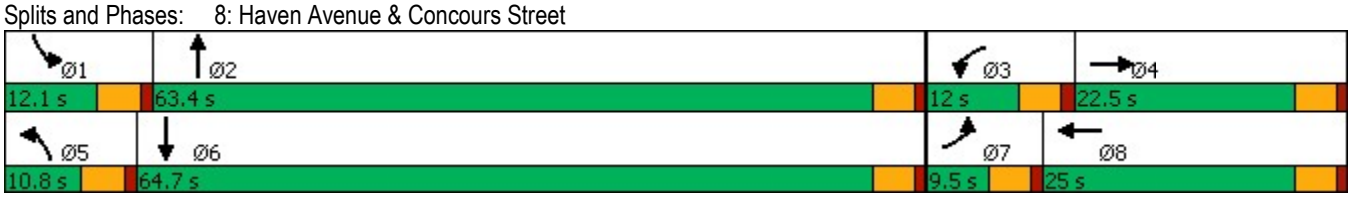
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	26	40	65	178	95	97	48	2366	213	44	1944	28
Future Volume (vph)	26	40	65	178	95	97	48	2366	213	44	1944	28
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	27	41	66	182	97	99	49	2414	217	45	1984	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	107	0	182	97	99	49	2414	217	45	1984	29

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	26	40	178	95	97	48	2366	213	44	1944	28
Future Volume (vph)	26	40	178	95	97	48	2366	213	44	1944	28
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	12.0	25.0		10.8	63.4		12.1	64.7	
Total Split (%)	8.6%	20.5%	10.9%	22.7%		9.8%	57.6%		11.0%	58.8%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.1	7.0	7.5	13.8	92.5	6.2	57.7	92.5	6.8	56.0	92.5
Actuated g/C Ratio	0.06	0.08	0.08	0.15	1.00	0.07	0.62	1.00	0.07	0.61	1.00
v/c Ratio	0.17	0.37	0.57	0.19	0.07	0.26	0.64	0.14	0.21	0.54	0.02
Control Delay	47.9	23.5	50.4	40.1	0.1	47.5	12.7	0.2	45.7	11.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	23.5	50.4	40.1	0.1	47.5	12.7	0.2	45.7	11.8	0.0
LOS	D	C	D	D	A	D	B	A	D	B	A
Approach Delay		28.4		34.6			12.3			12.4	
Approach LOS		C		C			B			B	

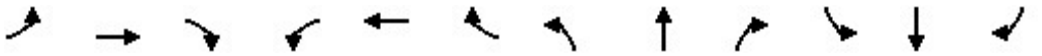
Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 92.5	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 14.4	Intersection LOS: B
Intersection Capacity Utilization 54.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	27	107	182	97	99	49	2414	217	45	1984	29
v/c Ratio	0.17	0.37	0.57	0.19	0.07	0.26	0.64	0.14	0.21	0.54	0.02
Control Delay	47.9	23.5	50.4	40.1	0.1	47.5	12.7	0.2	45.7	11.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	23.5	50.4	40.1	0.1	47.5	12.7	0.2	45.7	11.8	0.0
Queue Length 50th (ft)	8	13	39	30	0	15	268	0	13	194	0
Queue Length 95th (ft)	23	39	65	56	0	35	336	0	32	241	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	157	650	322	750	1500	198	3906	1500	239	3992	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.16	0.57	0.13	0.07	0.25	0.62	0.14	0.19	0.50	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	40	65	178	95	97	48	2366	213	44	1944	28
Future Volume (veh/h)	26	40	65	178	95	97	48	2366	213	44	1944	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	27	41	66	182	97	0	49	2414	0	45	1984	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	81	119	106	273	376		118	3701		113	3689	
Arrive On Green	0.03	0.07	0.07	0.07	0.11	0.00	0.04	0.61	0.00	0.04	0.61	0.00
Sat Flow, veh/h	2910	1683	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	27	41	66	182	97	0	49	2414	0	45	1984	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	0.8	1.9	3.6	3.8	2.2	0.0	1.4	21.6	0.0	1.3	16.0	0.0
Cycle Q Clear(g_c), s	0.8	1.9	3.6	3.8	2.2	0.0	1.4	21.6	0.0	1.3	16.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	81	119	106	273	376		118	3701		113	3689	
V/C Ratio(X)	0.33	0.34	0.62	0.67	0.26		0.41	0.65		0.40	0.54	
Avail Cap(c_a), veh/h	174	361	322	355	823		219	4281		264	4376	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	40.0	37.1	37.9	38.1	34.1	0.0	39.3	10.7	0.0	39.4	9.7	0.0
Incr Delay (d2), s/veh	2.4	1.7	5.8	3.1	0.4	0.0	2.3	0.3	0.0	2.3	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.8	1.5	1.3	0.9	0.0	0.5	6.3	0.0	0.5	4.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.4	38.8	43.7	41.2	34.4	0.0	41.6	11.0	0.0	41.6	9.8	0.0
LnGrp LOS	D	D	D	D	C		D	B		D	A	
Approach Vol, veh/h		134			279	A		2463	A		2029	A
Approach Delay, s/veh		41.9			38.8			11.6			10.5	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	55.4	10.3	10.4	7.9	55.3	6.8	13.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.6	58.9	7.5	18.0	6.3	60.2	5.0	20.5
Max Q Clear Time (g_c+I1), s	3.3	23.6	5.8	5.6	3.4	18.0	2.8	4.2
Green Ext Time (p_c), s	0.0	27.3	0.1	0.4	0.0	24.3	0.0	0.4

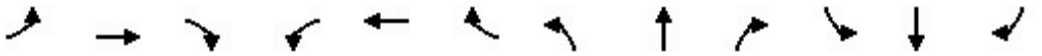
Intersection Summary	
HCM 6th Ctrl Delay	13.5
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.979			0.951						0.980	
Flt Protected	0.950	0.959			0.969		0.950			0.950		
Satd. Flow (prot)	1593	1574	0	0	1626	0	1676	4818	0	1676	4721	0
Flt Permitted	0.950	0.959					0.950			0.950		
Satd. Flow (perm)	1593	1574	0	0	1678	0	1676	4818	0	1676	4721	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		95			95						33	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



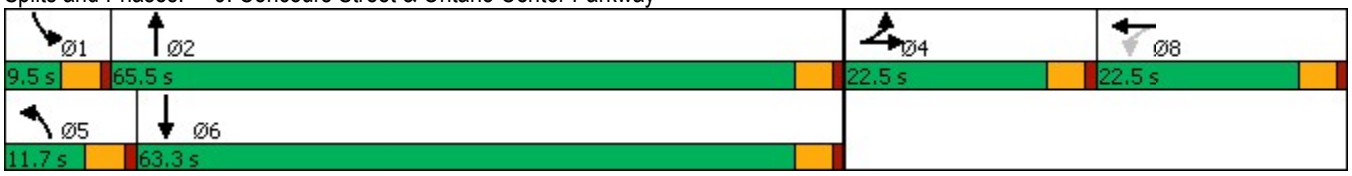
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	170	0	12	15	0	9	34	1801	5	1	1086	164
Future Volume (vph)	170	0	12	15	0	9	34	1801	5	1	1086	164
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	179	0	13	16	0	9	36	1896	5	1	1143	173
Shared Lane Traffic (%)	46%											
Lane Group Flow (vph)	97	95	0	0	25	0	36	1901	0	1	1316	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	170	0	15	0	34	1801	1	1086
Future Volume (vph)	170	0	15	0	34	1801	1	1086
Turn Type	Split	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	4	4		8	5	2	1	6
Permitted Phases			8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	11.7	65.5	9.5	63.3
Total Split (%)	18.8%	18.8%	18.8%	18.8%	9.8%	54.6%	7.9%	52.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	10.9	10.9		5.8	6.9	52.5	5.3	47.6
Actuated g/C Ratio	0.14	0.14		0.07	0.09	0.68	0.07	0.61
v/c Ratio	0.43	0.31		0.12	0.24	0.58	0.01	0.45
Control Delay	41.1	11.7		1.1	44.3	9.2	45.0	10.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	11.7		1.1	44.3	9.2	45.0	10.3
LOS	D	B		A	D	A	D	B
Approach Delay		26.6		1.1		9.8		10.3
Approach LOS		C		A		A		B

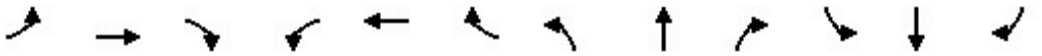
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 77.5	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 10.9	Intersection LOS: B
Intersection Capacity Utilization 52.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	97	95	25	36	1901	1	1316
v/c Ratio	0.43	0.31	0.12	0.24	0.58	0.01	0.45
Control Delay	41.1	11.7	1.1	44.3	9.2	45.0	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	11.7	1.1	44.3	9.2	45.0	10.3
Queue Length 50th (ft)	40	0	0	15	110	0	114
Queue Length 95th (ft)	118	48	0	58	362	7	222
Internal Link Dist (ft)		319	68		111		176
Turn Bay Length (ft)	170			115		120	
Base Capacity (vph)	390	457	482	164	3960	114	3785
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.21	0.05	0.22	0.48	0.01	0.35

Intersection Summary



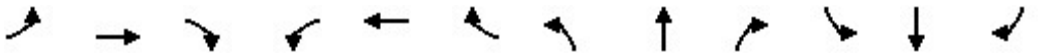
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	0	12	15	0	9	34	1801	5	1	1086	164
Future Volume (veh/h)	170	0	12	15	0	9	34	1801	5	1	1086	164
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	191	0	0	16	0	9	36	1896	5	1	1143	173
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	302	159	0	29	0	16	62	3019	8	3	2420	366
Arrive On Green	0.09	0.00	0.00	0.03	0.00	0.03	0.04	0.61	0.61	0.00	0.57	0.57
Sat Flow, veh/h	3375	1772	0	1034	0	582	1688	4981	13	1688	4240	641
Grp Volume(v), veh/h	191	0	0	25	0	0	36	1227	674	1	869	447
Grp Sat Flow(s),veh/h/ln	1688	1772	0	1616	0	0	1688	1612	1770	1688	1612	1656
Q Serve(g_s), s	3.6	0.0	0.0	1.0	0.0	0.0	1.4	15.8	15.8	0.0	10.4	10.4
Cycle Q Clear(g_c), s	3.6	0.0	0.0	1.0	0.0	0.0	1.4	15.8	15.8	0.0	10.4	10.4
Prop In Lane	1.00		0.00	0.64		0.36	1.00		0.01	1.00		0.39
Lane Grp Cap(c), veh/h	302	159	0	45	0	0	62	1954	1072	3	1840	945
V/C Ratio(X)	0.63	0.00	0.00	0.55	0.00	0.00	0.58	0.63	0.63	0.39	0.47	0.47
Avail Cap(c_a), veh/h	929	488	0	445	0	0	186	3007	1650	129	2899	1489
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.7	0.0	0.0	31.4	0.0	0.0	31.0	8.2	8.2	32.6	8.3	8.3
Incr Delay (d2), s/veh	2.2	0.0	0.0	10.2	0.0	0.0	8.3	0.3	0.6	75.0	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	0.5	0.0	0.0	0.7	4.3	4.8	0.1	3.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.9	0.0	0.0	41.6	0.0	0.0	39.4	8.5	8.8	107.6	8.4	8.6
LnGrp LOS	C	A	A	D	A	A	D	A	A	F	A	A
Approach Vol, veh/h		191			25			1937			1317	
Approach Delay, s/veh		30.9			41.6			9.2			8.6	
Approach LOS		C			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	44.1		10.4	6.9	41.8		6.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	61.0		18.0	7.2	58.8		18.0				
Max Q Clear Time (g_c+I1), s	2.0	17.8		5.6	3.4	12.4		3.0				
Green Ext Time (p_c), s	0.0	21.8		0.5	0.0	12.8		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		10.4	
HCM 6th LOS		B	

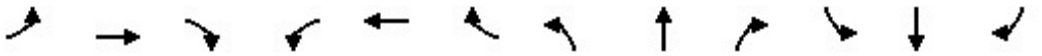
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			240			193			193			193
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



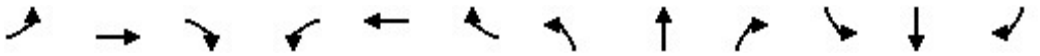
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	376	133	230	173	69	117	291	1664	130	184	1239	174
Future Volume (vph)	376	133	230	173	69	117	291	1664	130	184	1239	174
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	392	139	240	180	72	122	303	1733	135	192	1291	181
Shared Lane Traffic (%)												
Lane Group Flow (vph)	392	139	240	180	72	122	303	1733	135	192	1291	181

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	376	133	230	173	69	117	291	1664	130	184	1239	174
Future Volume (vph)	376	133	230	173	69	117	291	1664	130	184	1239	174
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	24.1	26.7		19.9	22.5		19.8	48.4		15.0	43.6	
Total Split (%)	21.9%	24.3%		18.1%	20.5%		18.0%	44.0%		13.6%	39.6%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	18.9	12.5	92.4	11.2	7.5	92.4	14.0	40.3	92.4	10.0	36.3	92.4
Actuated g/C Ratio	0.20	0.14	1.00	0.12	0.08	1.00	0.15	0.44	1.00	0.11	0.39	1.00
v/c Ratio	0.66	0.31	0.16	0.51	0.26	0.08	0.69	0.66	0.09	0.61	0.54	0.12
Control Delay	42.0	39.5	0.2	45.0	45.2	0.1	47.8	22.4	0.1	50.5	23.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	39.5	0.2	45.0	45.2	0.1	47.8	22.4	0.1	50.5	23.2	0.2
LOS	D	D	A	D	D	A	D	C	A	D	C	A
Approach Delay		28.6			30.4			24.6			23.8	
Approach LOS		C			C			C			C	

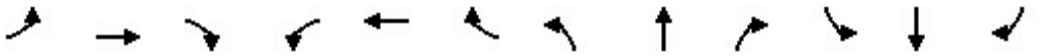
Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 92.4	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 25.4	Intersection LOS: C
Intersection Capacity Utilization 63.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Milliken Avenue & Concours Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	392	139	240	180	72	122	303	1733	135	192	1291	181
v/c Ratio	0.66	0.31	0.16	0.51	0.26	0.08	0.69	0.66	0.09	0.61	0.54	0.12
Control Delay	42.0	39.5	0.2	45.0	45.2	0.1	47.8	22.4	0.1	50.5	23.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	39.5	0.2	45.0	45.2	0.1	47.8	22.4	0.1	50.5	23.2	0.2
Queue Length 50th (ft)	120	41	0	55	22	0	93	238	0	60	176	0
Queue Length 95th (ft)	174	73	0	89	45	0	143	293	0	100	222	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	624	821	1500	490	665	1500	488	2939	1500	334	2617	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.17	0.16	0.37	0.11	0.08	0.62	0.59	0.09	0.57	0.49	0.12

Intersection Summary



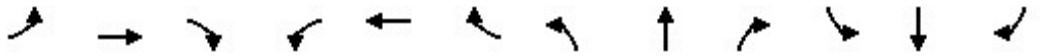
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	376	133	230	173	69	117	291	1664	130	184	1239	174
Future Volume (veh/h)	376	133	230	173	69	117	291	1664	130	184	1239	174
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	392	139	0	180	72	0	303	1733	0	192	1291	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	487	483		258	219		388	2697		265	2440	
Arrive On Green	0.17	0.14	0.00	0.09	0.07	0.00	0.13	0.44	0.00	0.09	0.40	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	392	139	0	180	72	0	303	1733	0	192	1291	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	10.0	2.8	0.0	4.6	1.6	0.0	7.7	17.0	0.0	4.9	12.4	0.0
Cycle Q Clear(g_c), s	10.0	2.8	0.0	4.6	1.6	0.0	7.7	17.0	0.0	4.9	12.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	487	483		258	219		388	2697		265	2440	
V/C Ratio(X)	0.81	0.29		0.70	0.33		0.78	0.64		0.72	0.53	
Avail Cap(c_a), veh/h	742	972		583	788		579	3480		397	3100	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.8	29.4	0.0	34.0	34.3	0.0	32.2	16.7	0.0	34.0	17.5	0.0
Incr Delay (d2), s/veh	3.8	0.3	0.0	3.4	0.9	0.0	4.0	0.3	0.0	3.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	1.1	0.0	1.7	0.7	0.0	2.9	5.5	0.0	1.8	4.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.6	29.7	0.0	37.4	35.2	0.0	36.3	17.0	0.0	37.7	17.7	0.0
LnGrp LOS	C	C		D	D		D	B		D	B	
Approach Vol, veh/h		531	A		252	A		2036	A		1483	A
Approach Delay, s/veh		33.4			36.8			19.8			20.3	
Approach LOS		C			D			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.5	38.5	11.3	15.5	14.7	35.3	17.4	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	43.9	15.4	22.2	15.3	39.1	19.6	18.0
Max Q Clear Time (g_c+I1), s	6.9	19.0	6.6	4.8	9.7	14.4	12.0	3.6
Green Ext Time (p_c), s	0.2	15.0	0.4	0.7	0.5	10.6	0.9	0.2

Intersection Summary	
HCM 6th Ctrl Delay	22.7
HCM 6th LOS	C

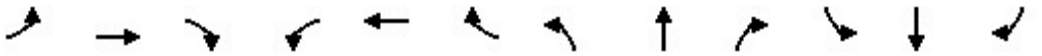
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55			177			237			177
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



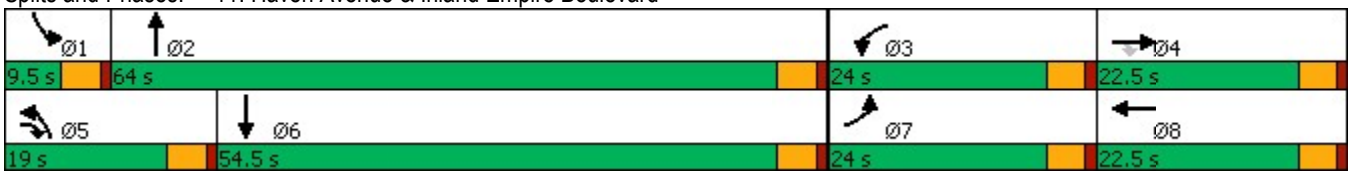
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	170	218	483	638	157	41	352	1934	435	42	2245	46
Future Volume (vph)	170	218	483	638	157	41	352	1934	435	42	2245	46
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	183	234	519	686	169	44	378	2080	468	45	2414	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	183	234	519	686	169	44	378	2080	468	45	2414	49

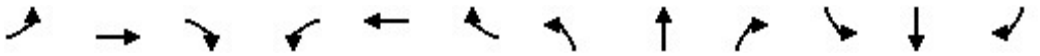
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	218	483	638	157	41	352	1934	435	42	2245	46
Future Volume (vph)	170	218	483	638	157	41	352	1934	435	42	2245	46
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	24.0	22.5	19.0	24.0	22.5		19.0	64.0		9.5	54.5	
Total Split (%)	20.0%	18.8%	15.8%	20.0%	18.8%		15.8%	53.3%		7.9%	45.4%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	12.6	13.3	32.3	19.5	20.2	115.4	14.5	61.5	115.4	5.0	50.0	115.4
Actuated g/C Ratio	0.11	0.12	0.28	0.17	0.18	1.00	0.13	0.53	1.00	0.04	0.43	1.00
v/c Ratio	0.58	0.61	1.13	1.03	0.29	0.03	1.04	0.64	0.31	0.36	0.92	0.03
Control Delay	56.4	55.4	117.4	90.1	43.4	0.0	107.7	21.0	0.5	62.9	37.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.4	55.4	117.4	90.1	43.4	0.0	107.7	21.0	0.5	62.9	37.7	0.0
LOS	E	E	F	F	D	A	F	C	A	E	D	A
Approach Delay		89.9			76.9			29.0			37.4	
Approach LOS		F			E			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 115.4	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 45.7	Intersection LOS: D
Intersection Capacity Utilization 92.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard



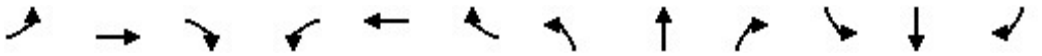


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	183	234	519	686	169	44	378	2080	468	45	2414	49
v/c Ratio	0.58	0.61	1.13	1.03	0.29	0.03	1.04	0.64	0.31	0.36	0.92	0.03
Control Delay	56.4	55.4	117.4	90.1	43.4	0.0	107.7	21.0	0.5	62.9	37.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.4	55.4	117.4	90.1	43.4	0.0	107.7	21.0	0.5	62.9	37.7	0.0
Queue Length 50th (ft)	67	88	~417	~193	57	0	~156	318	0	17	480	0
Queue Length 95th (ft)	105	130	#623	#289	94	0	#267	386	0	38	#581	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	488	523	459	666	587	1500	363	3236	1500	125	2632	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.45	1.13	1.03	0.29	0.03	1.04	0.64	0.31	0.36	0.92	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



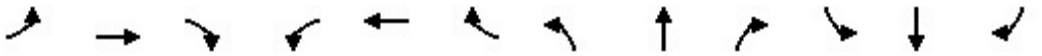
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	218	483	638	157	41	352	1934	435	42	2245	46
Future Volume (veh/h)	170	218	483	638	157	41	352	1934	435	42	2245	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	183	234	519	686	169	0	378	2080	0	45	2414	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	237	505	407	645	779		352	3077		94	2537	
Arrive On Green	0.08	0.15	0.15	0.16	0.23	0.00	0.12	0.50	0.00	0.03	0.42	0.00
Sat Flow, veh/h	2910	3367	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	183	234	519	686	169	0	378	2080	0	45	2414	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	7.4	7.6	18.0	19.5	4.9	0.0	14.5	30.8	0.0	1.8	45.9	0.0
Cycle Q Clear(g_c), s	7.4	7.6	18.0	19.5	4.9	0.0	14.5	30.8	0.0	1.8	45.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	237	505	407	645	779		352	3077		94	2537	
V/C Ratio(X)	0.77	0.46	1.28	1.06	0.22		1.07	0.68		0.48	0.95	
Avail Cap(c_a), veh/h	473	505	407	645	779		352	3077		121	2542	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	54.0	46.5	43.7	50.2	37.3	0.0	52.7	22.3	0.0	57.0	33.8	0.0
Incr Delay (d2), s/veh	5.3	0.7	141.7	53.6	0.1	0.0	69.1	0.6	0.0	3.7	9.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	3.2	28.0	9.6	2.0	0.0	8.7	10.9	0.0	0.7	18.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.3	47.2	185.4	103.8	37.4	0.0	121.8	22.9	0.0	60.7	42.9	0.0
LnGrp LOS	E	D	F	F	D		F	C		E	D	
Approach Vol, veh/h		936			855	A		2458	A		2459	A
Approach Delay, s/veh		126.2			90.7			38.1			43.2	
Approach LOS		F			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	65.0	24.0	22.5	19.0	54.4	14.3	32.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	59.5	19.5	18.0	14.5	50.0	19.5	18.0
Max Q Clear Time (g_c+I1), s	3.8	32.8	21.5	20.0	16.5	47.9	9.4	6.9
Green Ext Time (p_c), s	0.0	19.1	0.0	0.0	0.0	2.0	0.4	0.7

Intersection Summary	
HCM 6th Ctrl Delay	59.0
HCM 6th LOS	E

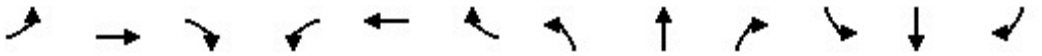
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			340			177			177			177
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



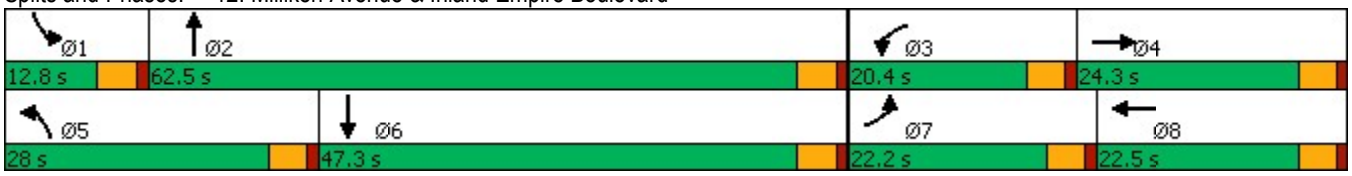
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	294	287	323	212	78	86	391	1680	365	97	1475	119
Future Volume (vph)	294	287	323	212	78	86	391	1680	365	97	1475	119
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	309	302	340	223	82	91	412	1768	384	102	1553	125
Shared Lane Traffic (%)												
Lane Group Flow (vph)	309	302	340	223	82	91	412	1768	384	102	1553	125

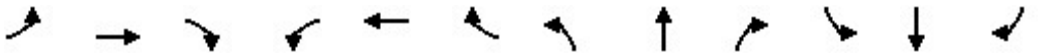
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	294	287	323	212	78	86	391	1680	365	97	1475	119
Future Volume (vph)	294	287	323	212	78	86	391	1680	365	97	1475	119
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	22.2	24.3		20.4	22.5		28.0	62.5		12.8	47.3	
Total Split (%)	18.5%	20.3%		17.0%	18.8%		23.3%	52.1%		10.7%	39.4%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	18.9	14.9	105.0	13.1	12.0	105.0	19.6	50.5	105.0	7.9	38.8	105.0
Actuated g/C Ratio	0.18	0.14	1.00	0.12	0.11	1.00	0.19	0.48	1.00	0.08	0.37	1.00
v/c Ratio	0.60	0.63	0.23	0.62	0.21	0.06	0.76	0.61	0.26	0.47	0.69	0.08
Control Delay	48.9	50.5	0.3	53.6	45.8	0.1	52.0	21.2	0.4	58.0	30.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.9	50.5	0.3	53.6	45.8	0.1	52.0	21.2	0.4	58.0	30.7	0.1
LOS	D	D	A	D	D	A	D	C	A	E	C	A
Approach Delay		32.0			39.7			23.0			30.1	
Approach LOS		C			D			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 105	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 27.9	Intersection LOS: C
Intersection Capacity Utilization 66.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	309	302	340	223	82	91	412	1768	384	102	1553	125
v/c Ratio	0.60	0.63	0.23	0.62	0.21	0.06	0.76	0.61	0.26	0.47	0.69	0.08
Control Delay	48.9	50.5	0.3	53.6	45.8	0.1	52.0	21.2	0.4	58.0	30.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.9	50.5	0.3	53.6	45.8	0.1	52.0	21.2	0.4	58.0	30.7	0.1
Queue Length 50th (ft)	108	108	0	78	28	0	144	249	0	36	262	0
Queue Length 95th (ft)	169	162	0	127	54	0	213	320	0	70	344	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	540	647	1500	448	588	1500	663	3435	1500	234	2534	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.47	0.23	0.50	0.14	0.06	0.62	0.51	0.26	0.44	0.61	0.08

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	294	287	323	212	78	86	391	1680	365	97	1475	119
Future Volume (veh/h)	294	287	323	212	78	86	391	1680	365	97	1475	119
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	309	302	0	223	82	0	412	1768	0	102	1553	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	390	424		299	319		504	3072		157	2344	
Arrive On Green	0.13	0.13	0.00	0.10	0.09	0.00	0.17	0.50	0.00	0.05	0.38	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	309	302	0	223	82	0	412	1768	0	102	1553	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	8.7	7.3	0.0	6.3	1.9	0.0	11.5	17.1	0.0	2.9	17.7	0.0
Cycle Q Clear(g_c), s	8.7	7.3	0.0	6.3	1.9	0.0	11.5	17.1	0.0	2.9	17.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	390	424		299	319		504	3072		157	2344	
V/C Ratio(X)	0.79	0.71		0.75	0.26		0.82	0.58		0.65	0.66	
Avail Cap(c_a), veh/h	611	791		549	719		812	4196		287	3096	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.4	35.4	0.0	36.7	35.4	0.0	33.6	14.6	0.0	39.1	21.4	0.0
Incr Delay (d2), s/veh	3.8	2.2	0.0	3.7	0.4	0.0	3.5	0.2	0.0	4.5	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	3.0	0.0	2.3	0.8	0.0	4.2	5.5	0.0	1.1	6.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.2	37.6	0.0	40.4	35.8	0.0	37.1	14.8	0.0	43.6	21.7	0.0
LnGrp LOS	D	D		D	D		D	B		D	C	
Approach Vol, veh/h		611	A		305	A		2180	A		1655	A
Approach Delay, s/veh		38.4			39.2			19.0			23.1	
Approach LOS		D			D			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	47.0	13.2	15.1	19.1	36.9	15.8	12.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.3	58.0	15.9	19.8	23.5	42.8	17.7	18.0
Max Q Clear Time (g_c+I1), s	4.9	19.1	8.3	9.3	13.5	19.7	10.7	3.9
Green Ext Time (p_c), s	0.1	19.8	0.4	1.3	1.1	12.7	0.6	0.3

Intersection Summary	
HCM 6th Ctrl Delay	24.2
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.984	0.850				
Flt Protected	0.957					
Satd. Flow (prot)	3045	1365	6071	0	0	6071
Flt Permitted	0.957					
Satd. Flow (perm)	3045	1365	6071	0	0	6071
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	3	3				
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	498	314	2273	0	0	2266
Future Volume (vph)	498	314	2273	0	0	2266
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	519	327	2368	0	0	2360
Shared Lane Traffic (%)		19%				
Lane Group Flow (vph)	581	265	2368	0	0	2360

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	498	314	2273	2266
Future Volume (vph)	498	314	2273	2266
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	41.0	41.0
Total Split (%)	36.9%	36.9%	63.1%	63.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	16.5	16.5	36.6	36.6
Actuated g/C Ratio	0.27	0.27	0.59	0.59
v/c Ratio	0.72	0.73	0.66	0.66
Control Delay	26.0	33.1	10.2	10.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	26.0	33.1	10.2	10.2
LOS	C	C	B	B
Approach Delay	28.2		10.2	10.2
Approach LOS	C		B	B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 62.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 12.9	Intersection LOS: B
Intersection Capacity Utilization 65.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	581	265	2368	2360
v/c Ratio	0.72	0.73	0.66	0.66
Control Delay	26.0	33.1	10.2	10.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	26.0	33.1	10.2	10.2
Queue Length 50th (ft)	101	97	164	164
Queue Length 95th (ft)	149	#184	216	215
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	960	431	3575	3575
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.61	0.61	0.66	0.66

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

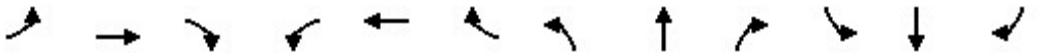
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	498	314	2273	0	0	2266
Future Volume (veh/h)	498	314	2273	0	0	2266
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1673	1772	1772	0	0	1772
Adj Flow Rate, veh/h	561	282	2368	0	0	2360
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	788	371	3613	0	0	3613
Arrive On Green	0.25	0.25	0.59	0.00	0.00	0.59
Sat Flow, veh/h	3188	1502	6592	0	0	6592
Grp Volume(v), veh/h	561	282	2368	0	0	2360
Grp Sat Flow(s),veh/h/ln	1594	1502	1524	0	0	1524
Q Serve(g_s), s	9.0	9.8	14.6	0.0	0.0	14.5
Cycle Q Clear(g_c), s	9.0	9.8	14.6	0.0	0.0	14.5
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	788	371	3613	0	0	3613
V/C Ratio(X)	0.71	0.76	0.66	0.00	0.00	0.65
Avail Cap(c_a), veh/h	1105	521	3956	0	0	3956
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	19.3	19.6	7.6	0.0	0.0	7.6
Incr Delay (d2), s/veh	1.3	4.1	0.4	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	3.5	3.5	0.0	0.0	3.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.6	23.8	8.0	0.0	0.0	8.0
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	843		2368			2360
Approach Delay, s/veh	21.7		8.0			8.0
Approach LOS	C		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		37.8			37.8	18.4
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		36.5			36.5	19.5
Max Q Clear Time (g_c+I1), s		16.6			16.5	11.8
Green Ext Time (p_c), s		16.8			16.8	2.1

Intersection Summary	
HCM 6th Ctrl Delay	10.0
HCM 6th LOS	B

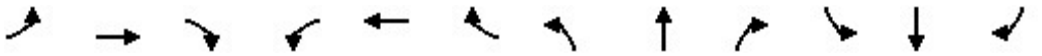
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			146			136			281			55
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



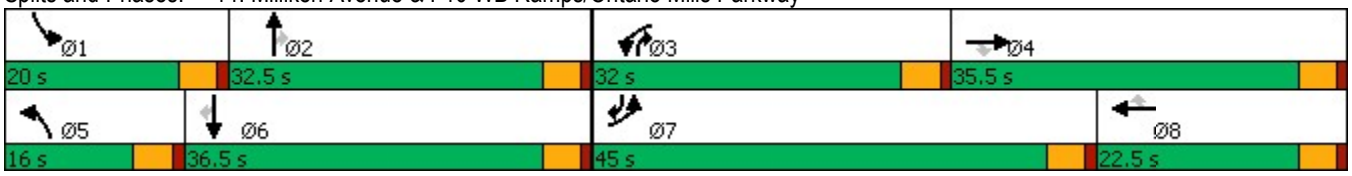
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	852	197	237	253	301	63	240	1033	453	332	1143	479
Future Volume (vph)	852	197	237	253	301	63	240	1033	453	332	1143	479
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	888	205	247	264	314	66	250	1076	472	346	1191	499
Shared Lane Traffic (%)												
Lane Group Flow (vph)	888	205	247	264	314	66	250	1076	472	346	1191	499

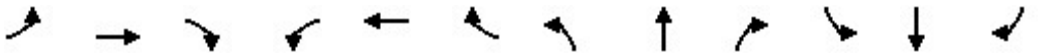
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	852	197	237	253	301	63	240	1033	453	332	1143	479
Future Volume (vph)	852	197	237	253	301	63	240	1033	453	332	1143	479
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	45.0	35.5	35.5	32.0	22.5	22.5	16.0	32.5	32.0	20.0	36.5	45.0
Total Split (%)	37.5%	29.6%	29.6%	26.7%	18.8%	18.8%	13.3%	27.1%	26.7%	16.7%	30.4%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	38.7	37.6	37.6	16.5	15.4	15.4	11.6	26.5	47.5	15.5	30.4	73.6
Actuated g/C Ratio	0.34	0.33	0.33	0.14	0.13	0.13	0.10	0.23	0.42	0.14	0.27	0.64
v/c Ratio	0.91	0.35	0.42	0.63	0.69	0.21	0.85	0.76	0.60	0.88	0.74	0.51
Control Delay	50.6	32.4	15.3	53.4	56.5	1.5	78.1	45.5	13.0	73.8	41.8	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.6	32.4	15.3	53.4	56.5	1.5	78.1	45.5	13.0	73.8	41.8	11.6
LOS	D	C	B	D	E	A	E	D	B	E	D	B
Approach Delay		41.3			49.6			41.5			39.9	
Approach LOS		D			D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 114.2	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 41.8	Intersection LOS: D
Intersection Capacity Utilization 79.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway

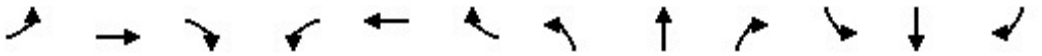




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	888	205	247	264	314	66	250	1076	472	346	1191	499
v/c Ratio	0.91	0.35	0.42	0.63	0.69	0.21	0.85	0.76	0.60	0.88	0.74	0.51
Control Delay	50.6	32.4	15.3	53.4	56.5	1.5	78.1	45.5	13.0	73.8	41.8	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.6	32.4	15.3	53.4	56.5	1.5	78.1	45.5	13.0	73.8	41.8	11.6
Queue Length 50th (ft)	329	117	55	98	121	0	98	222	104	136	240	159
Queue Length 95th (ft)	#458	197	137	138	171	0	#178	269	199	#229	288	251
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	1031	580	591	700	531	352	293	1497	907	394	1711	1013
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.35	0.42	0.38	0.59	0.19	0.85	0.72	0.52	0.88	0.70	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	852	197	237	253	301	63	240	1033	453	332	1143	479
Future Volume (veh/h)	852	197	237	253	301	63	240	1033	453	332	1143	479
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	888	205	247	264	314	66	250	1076	472	346	1191	499
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	961	594	503	331	400	178	298	1542	551	394	1743	925
Arrive On Green	0.33	0.34	0.34	0.11	0.12	0.12	0.10	0.25	0.25	0.14	0.29	0.29
Sat Flow, veh/h	2910	1772	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	888	205	247	264	314	66	250	1076	472	346	1191	499
Grp Sat Flow(s),veh/h/ln	1455	1772	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	32.6	9.6	14.5	9.8	10.0	4.5	9.3	17.7	28.0	12.9	19.2	21.1
Cycle Q Clear(g_c), s	32.6	9.6	14.5	9.8	10.0	4.5	9.3	17.7	28.0	12.9	19.2	21.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	961	594	503	331	400	178	298	1542	551	394	1743	925
V/C Ratio(X)	0.92	0.35	0.49	0.80	0.79	0.37	0.84	0.70	0.86	0.88	0.68	0.54
Avail Cap(c_a), veh/h	1065	594	503	723	548	244	302	1542	551	408	1762	930
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.7	27.7	29.3	47.8	47.4	45.0	48.8	37.5	32.4	46.9	35.1	12.2
Incr Delay (d2), s/veh	12.4	0.3	0.7	4.4	5.2	1.3	18.2	1.4	12.7	18.6	1.1	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.0	4.1	5.3	3.7	4.5	1.7	4.1	6.7	13.4	5.7	7.2	6.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.1	28.0	30.0	52.3	52.6	46.2	67.0	38.9	45.1	65.6	36.1	12.8
LnGrp LOS	D	C	C	D	D	D	E	D	D	E	D	B
Approach Vol, veh/h		1340			644			1798			2036	
Approach Delay, s/veh		41.7			51.8			44.4			35.4	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.5	32.5	17.1	41.6	15.8	36.2	41.0	17.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	28.0	27.5	31.0	11.5	32.0	40.5	18.0
Max Q Clear Time (g_c+I1), s	14.9	30.0	11.8	16.5	11.3	23.1	34.6	12.0
Green Ext Time (p_c), s	0.1	0.0	0.8	1.8	0.0	6.1	2.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	41.5
HCM 6th LOS	D

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.993	0.850				
Flt Protected	0.954					
Satd. Flow (prot)	3063	1365	0	6071	6071	0
Flt Permitted	0.954					
Satd. Flow (perm)	3063	1365	0	6071	6071	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	6	14				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

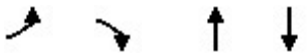
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	544	247	0	2465	1900	0
Future Volume (vph)	544	247	0	2465	1900	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	567	257	0	2568	1979	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	593	231	0	2568	1979	0

Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	544	247	2465	1900
Future Volume (vph)	544	247	2465	1900
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	54.0	54.0
Total Split (%)	32.5%	32.5%	67.5%	67.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	19.0	19.0	49.6	49.6
Actuated g/C Ratio	0.24	0.24	0.64	0.64
v/c Ratio	0.79	0.67	0.66	0.51
Control Delay	35.3	35.2	10.2	8.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	35.3	35.2	10.2	8.4
LOS	D	D	B	A
Approach Delay	35.3		10.2	8.4
Approach LOS	D		B	A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 77.6	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 65.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps



Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	593	231	2568	1979
v/c Ratio	0.79	0.67	0.66	0.51
Control Delay	35.3	35.2	10.2	8.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	35.3	35.2	10.2	8.4
Queue Length 50th (ft)	136	103	215	141
Queue Length 95th (ft)	193	186	259	173
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	854	389	3879	3879
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.69	0.59	0.66	0.51

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	544	247	0	2465	1900	0
Future Volume (veh/h)	544	247	0	2465	1900	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1772	0	1772	1772	0
Adj Flow Rate, veh/h	567	257	0	2568	1979	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	721	340	0	3929	3929	0
Arrive On Green	0.23	0.23	0.00	0.64	0.64	0.00
Sat Flow, veh/h	3188	1502	0	6592	6592	0
Grp Volume(v), veh/h	567	257	0	2568	1979	0
Grp Sat Flow(s),veh/h/ln	1594	1502	0	1524	1524	0
Q Serve(g_s), s	11.7	11.1	0.0	18.0	11.9	0.0
Cycle Q Clear(g_c), s	11.7	11.1	0.0	18.0	11.9	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	721	340	0	3929	3929	0
V/C Ratio(X)	0.79	0.76	0.00	0.65	0.50	0.00
Avail Cap(c_a), veh/h	985	464	0	4335	4335	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.3	25.1	0.0	7.6	6.5	0.0
Incr Delay (d2), s/veh	3.0	4.8	0.0	0.3	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	4.2	0.0	4.5	3.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.3	29.9	0.0	7.9	6.6	0.0
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	824			2568	1979	
Approach Delay, s/veh	28.8			7.9	6.6	
Approach LOS	C			A	A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		49.4		20.2		49.4
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		49.5		21.5		49.5
Max Q Clear Time (g_c+I1), s		20.0		13.7		13.9
Green Ext Time (p_c), s		24.9		2.1		21.9

Intersection Summary		
HCM 6th Ctrl Delay	10.6	
HCM 6th LOS	B	

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1600	1800	1600	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2891	1500	2891	6071	6071	1500
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2891	1500	2891	6071	6071	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		9				83
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	513	202	326	1219	1028	622
Future Volume (vph)	513	202	326	1219	1028	622
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	529	208	336	1257	1060	641
Shared Lane Traffic (%)						
Lane Group Flow (vph)	529	208	336	1257	1060	641

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	513	202	326	1219	1028	622
Future Volume (vph)	513	202	326	1219	1028	622
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	22.5	14.9	14.9	37.5	22.6	22.5
Total Split (%)	37.5%	24.8%	24.8%	62.5%	37.7%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	15.3	29.7	9.9	31.1	16.6	36.5
Actuated g/C Ratio	0.28	0.54	0.18	0.56	0.30	0.66
v/c Ratio	0.66	0.26	0.65	0.37	0.58	0.63
Control Delay	22.7	7.8	29.4	7.4	18.4	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	7.8	29.4	7.4	18.4	8.1
LOS	C	A	C	A	B	A
Approach Delay	18.5			12.1	14.5	
Approach LOS	B			B	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 55.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 14.3	Intersection LOS: B
Intersection Capacity Utilization 59.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	529	208	336	1257	1060	641
v/c Ratio	0.66	0.26	0.65	0.37	0.58	0.63
Control Delay	22.7	7.8	29.4	7.4	18.4	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	7.8	29.4	7.4	18.4	8.1
Queue Length 50th (ft)	83	34	58	65	91	85
Queue Length 95th (ft)	128	66	#100	87	123	166
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	951	826	549	3662	2008	1090
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.25	0.61	0.34	0.53	0.59

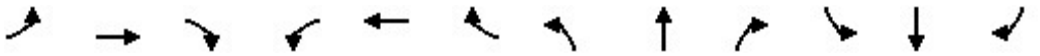
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	513	202	326	1219	1028	622
Future Volume (veh/h)	513	202	326	1219	1028	622
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1772	1575	1772	1772	1772
Adj Flow Rate, veh/h	529	208	336	1257	1060	641
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	700	593	448	3577	2113	882
Arrive On Green	0.24	0.24	0.15	0.59	0.35	0.35
Sat Flow, veh/h	2910	1502	2910	6343	6343	1502
Grp Volume(v), veh/h	529	208	336	1257	1060	641
Grp Sat Flow(s),veh/h/ln	1455	1502	1455	1524	1524	1502
Q Serve(g_s), s	8.8	5.1	5.8	5.6	7.2	16.0
Cycle Q Clear(g_c), s	8.8	5.1	5.8	5.6	7.2	16.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	700	593	448	3577	2113	882
V/C Ratio(X)	0.76	0.35	0.75	0.35	0.50	0.73
Avail Cap(c_a), veh/h	1004	749	580	3855	2114	882
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.4	11.1	21.1	5.6	13.5	7.8
Incr Delay (d2), s/veh	2.0	0.4	4.0	0.1	0.2	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	4.9	2.0	1.2	2.1	8.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.4	11.5	25.1	5.7	13.7	10.8
LnGrp LOS	C	B	C	A	B	B
Approach Vol, veh/h	737			1593	1701	
Approach Delay, s/veh	17.9			9.8	12.6	
Approach LOS	B			A	B	

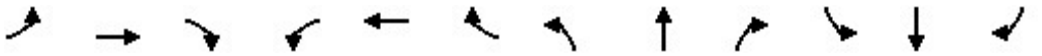
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		35.1		17.1	12.5	22.6
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		33.0		18.0	10.4	18.1
Max Q Clear Time (g_c+I1), s		7.6		10.8	7.8	18.0
Green Ext Time (p_c), s		10.4		1.8	0.3	0.1

Intersection Summary	
HCM 6th Ctrl Delay	12.4
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.972				0.850			0.850		0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4683	0	2891	3353	1500	2891	4818	1500	2891	6010	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4683	0	2891	3353	1500	2891	4818	1500	2891	6010	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		48				212			271		15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



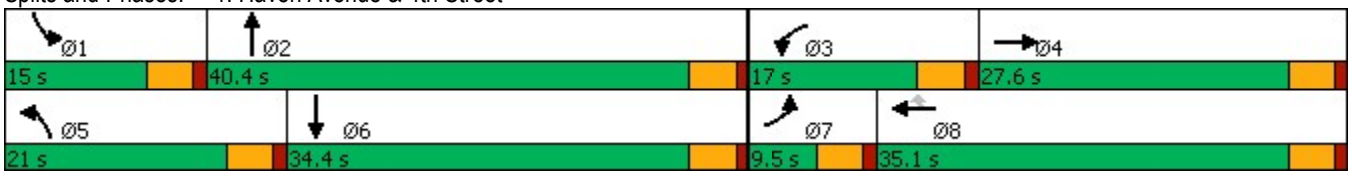
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	52	566	128	251	538	199	185	1148	376	206	1115	79
Future Volume (vph)	52	566	128	251	538	199	185	1148	376	206	1115	79
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	55	602	136	267	572	212	197	1221	400	219	1186	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	738	0	267	572	212	197	1221	400	219	1270	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	52	566	251	538	199	185	1148	376	206	1115
Future Volume (vph)	52	566	251	538	199	185	1148	376	206	1115
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	9.5	27.6	17.0	35.1	35.1	21.0	40.4		15.0	34.4
Total Split (%)	9.5%	27.6%	17.0%	35.1%	35.1%	21.0%	40.4%		15.0%	34.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	5.0	20.3	12.0	29.4	29.4	11.9	36.0	96.5	10.2	34.3
Actuated g/C Ratio	0.05	0.21	0.12	0.30	0.30	0.12	0.37	1.00	0.11	0.36
v/c Ratio	0.37	0.72	0.75	0.56	0.35	0.55	0.68	0.27	0.72	0.59
Control Delay	52.8	37.5	55.2	31.2	5.5	46.1	28.3	0.4	56.9	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.8	37.5	55.2	31.2	5.5	46.1	28.3	0.4	56.9	27.4
LOS	D	D	E	C	A	D	C	A	E	C
Approach Delay		38.6		32.1			24.1			31.7
Approach LOS		D		C			C			C

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 96.5	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 30.2	Intersection LOS: C
Intersection Capacity Utilization 68.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Haven Avenue & 4th Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	55	738	267	572	212	197	1221	400	219	1270
v/c Ratio	0.37	0.72	0.75	0.56	0.35	0.55	0.68	0.27	0.72	0.59
Control Delay	52.8	37.5	55.2	31.2	5.5	46.1	28.3	0.4	56.9	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.8	37.5	55.2	31.2	5.5	46.1	28.3	0.4	56.9	27.4
Queue Length 50th (ft)	17	146	84	160	0	60	234	0	69	185
Queue Length 95th (ft)	38	190	#140	215	51	94	294	0	#121	243
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	150	1160	375	1066	621	495	1797	1500	315	2144
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.64	0.71	0.54	0.34	0.40	0.68	0.27	0.70	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

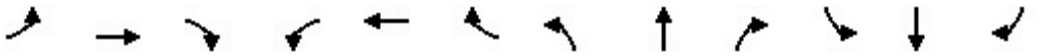
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	566	128	251	538	199	185	1148	376	206	1115	79
Future Volume (veh/h)	52	566	128	251	538	199	185	1148	376	206	1115	79
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	55	602	136	267	572	212	197	1221	0	219	1186	84
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	120	793	176	331	918	409	266	1900		281	2329	164
Arrive On Green	0.04	0.20	0.20	0.11	0.27	0.27	0.09	0.39	0.00	0.10	0.40	0.40
Sat Flow, veh/h	2910	3960	879	2910	3367	1502	2910	4837	1502	2910	5856	413
Grp Volume(v), veh/h	55	488	250	267	572	212	197	1221	0	219	925	345
Grp Sat Flow(s),veh/h/ln	1455	1612	1614	1455	1683	1502	1455	1612	1502	1455	1524	1698
Q Serve(g_s), s	1.7	13.0	13.4	8.2	13.6	10.9	6.0	18.7	0.0	6.7	14.0	14.0
Cycle Q Clear(g_c), s	1.7	13.0	13.4	8.2	13.6	10.9	6.0	18.7	0.0	6.7	14.0	14.0
Prop In Lane	1.00		0.54	1.00		1.00	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	120	645	323	331	918	409	266	1900		281	1818	675
V/C Ratio(X)	0.46	0.76	0.77	0.81	0.62	0.52	0.74	0.64		0.78	0.51	0.51
Avail Cap(c_a), veh/h	159	815	408	398	1127	503	525	1900		334	1818	675
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.8	34.5	34.6	39.5	29.1	28.2	40.5	22.5	0.0	40.3	20.8	20.8
Incr Delay (d2), s/veh	2.7	3.1	7.0	9.9	0.7	1.0	4.0	1.7	0.0	9.5	1.0	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	5.3	5.8	3.3	5.5	4.0	2.3	7.1	0.0	2.7	5.0	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.5	37.6	41.6	49.4	29.9	29.2	44.5	24.2	0.0	49.9	21.8	23.6
LnGrp LOS	D	D	D	D	C	C	D	C		D	C	C
Approach Vol, veh/h		793			1051			1418	A		1489	
Approach Delay, s/veh		39.4			34.7			27.0			26.3	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.3	40.4	14.9	22.8	12.9	40.8	8.3	29.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	35.9	12.5	23.1	16.5	29.9	5.0	30.6
Max Q Clear Time (g_c+I1), s	8.7	20.7	10.2	15.4	8.0	16.0	3.7	15.6
Green Ext Time (p_c), s	0.1	7.7	0.2	2.9	0.4	7.2	0.0	4.1

Intersection Summary	
HCM 6th Ctrl Delay	30.6
HCM 6th LOS	C

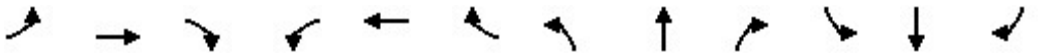
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.992				0.850			0.850		0.850	
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1667	6022	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1667	6022	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15				153			386		271	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



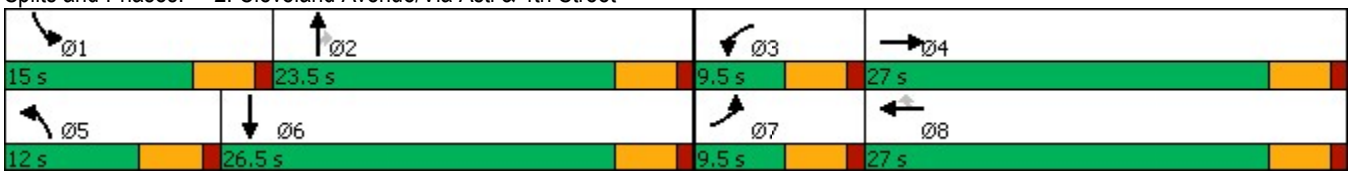
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	1170	64	3	941	4	59	0	4	3	0	1
Future Volume (vph)	0	1170	64	3	941	4	59	0	4	3	0	1
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1206	66	3	970	4	61	0	4	3	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1272	0	3	970	4	61	0	4	3	1	0

Intersection Summary

Lane Group	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT	Ø7
Lane Configurations									
Traffic Volume (vph)	1170	3	941	4	59	4	3	0	
Future Volume (vph)	1170	3	941	4	59	4	3	0	
Turn Type	NA	Prot	NA	Perm	Prot	Perm	Prot	NA	
Protected Phases	4	3	8		5		1	6	7
Permitted Phases				8		2			
Detector Phase	4	3	8	8	5	2	1	6	
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5	9.5
Total Split (s)	27.0	9.5	27.0	27.0	12.0	23.5	15.0	26.5	9.5
Total Split (%)	36.0%	12.7%	36.0%	36.0%	16.0%	31.3%	20.0%	35.3%	13%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min	None
Act Effct Green (s)	19.2	5.5	20.6	20.6	7.1	10.4	6.1	6.0	
Actuated g/C Ratio	0.45	0.13	0.49	0.49	0.17	0.25	0.14	0.14	
v/c Ratio	0.46	0.01	0.41	0.00	0.23	0.01	0.01	0.00	
Control Delay	9.7	22.7	8.0	0.0	22.4	0.0	22.0	0.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	9.7	22.7	8.0	0.0	22.4	0.0	22.0	0.0	
LOS	A	C	A	A	C	A	C	A	
Approach Delay	9.7		8.0					16.5	
Approach LOS	A		A					B	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 42.4	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.46	
Intersection Signal Delay: 9.4	Intersection LOS: A
Intersection Capacity Utilization 38.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street



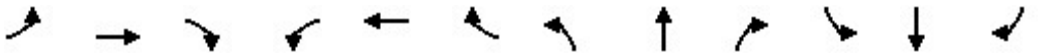
Lane Group	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	1272	3	970	4	61	4	3	1
v/c Ratio	0.46	0.01	0.41	0.00	0.23	0.01	0.01	0.00
Control Delay	9.7	22.7	8.0	0.0	22.4	0.0	22.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.7	22.7	8.0	0.0	22.4	0.0	22.0	0.0
Queue Length 50th (ft)	64	1	62	0	15	0	1	0
Queue Length 95th (ft)	125	8	86	0	50	0	8	0
Internal Link Dist (ft)	2546		362					358
Turn Bay Length (ft)		130		145	165	165	50	
Base Capacity (vph)	3501	204	2953	978	306	931	428	1734
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.01	0.33	0.00	0.20	0.00	0.01	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1170	64	3	941	4	59	0	4	3	0	1
Future Volume (veh/h)	0	1170	64	3	941	4	59	0	4	3	0	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	0	1206	66	3	970	4	61	0	4	3	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	4	2269	124	7	2386	741	97	314	266	7	203	181
Arrive On Green	0.00	0.38	0.38	0.00	0.49	0.49	0.06	0.00	0.18	0.00	0.00	0.12
Sat Flow, veh/h	1594	5960	325	1594	4837	1502	1594	1772	1502	1594	1683	1502
Grp Volume(v), veh/h	0	924	348	3	970	4	61	0	4	3	0	1
Grp Sat Flow(s),veh/h/ln	1594	1524	1713	1594	1612	1502	1594	1772	1502	1594	1683	1502
Q Serve(g_s), s	0.0	6.5	6.5	0.1	5.3	0.1	1.6	0.0	0.1	0.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	6.5	6.5	0.1	5.3	0.1	1.6	0.0	0.1	0.1	0.0	0.0
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	4	1741	652	7	2386	741	97	314	266	7	203	181
V/C Ratio(X)	0.00	0.53	0.53	0.46	0.41	0.01	0.63	0.00	0.02	0.46	0.00	0.01
Avail Cap(c_a), veh/h	192	2479	929	192	2623	814	288	811	688	403	893	796
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	10.0	10.0	20.6	6.7	5.3	19.0	0.0	14.1	20.6	0.0	16.1
Incr Delay (d2), s/veh	0.0	0.3	0.7	43.1	0.1	0.0	6.5	0.0	0.0	43.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.7	2.0	0.1	1.2	0.0	0.7	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	10.2	10.7	63.7	6.8	5.3	25.6	0.0	14.1	63.7	0.0	16.1
LnGrp LOS	A	B	B	E	A	A	C	A	B	E	A	B
Approach Vol, veh/h		1272			977			65			4	
Approach Delay, s/veh		10.3			6.9			24.9			51.8	
Approach LOS		B			A			C			D	

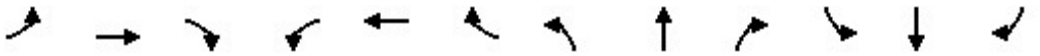
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	11.9	4.7	20.3	7.0	9.5	0.0	25.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	19.0	5.0	22.5	7.5	22.0	5.0	22.5
Max Q Clear Time (g_c+I1), s	2.1	2.1	2.1	8.5	3.6	2.0	0.0	7.3
Green Ext Time (p_c), s	0.0	0.0	0.0	7.3	0.0	0.0	0.0	6.1

Intersection Summary	
HCM 6th Ctrl Delay	9.4
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.992				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.953	
Satd. Flow (prot)	2891	6065	0	1583	4779	0	1583	1765	1500	0	1682	1500
Flt Permitted	0.950			0.950			0.725				0.731	
Satd. Flow (perm)	2891	6065	0	1583	4779	0	1208	1765	1500	0	1290	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			15				225			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



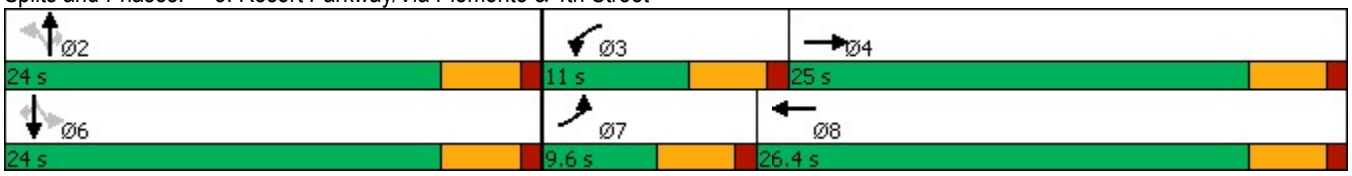
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	11	1151	8	65	884	47	32	0	37	47	1	16
Future Volume (vph)	11	1151	8	65	884	47	32	0	37	47	1	16
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	1187	8	67	911	48	33	0	38	48	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	1195	0	67	959	0	33	0	38	0	49	16

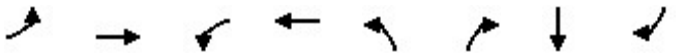
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	11	1151	65	884	32	37	47	1	16
Future Volume (vph)	11	1151	65	884	32	37	47	1	16
Turn Type	Prot	NA	Prot	NA	Perm	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8				6	
Permitted Phases					2	2	6		6
Detector Phase	7	4	3	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.6	25.0	11.0	26.4	24.0	24.0	24.0	24.0	24.0
Total Split (%)	16.0%	41.7%	18.3%	44.0%	40.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min
Act Effct Green (s)	5.5	17.4	6.6	21.3	7.3	7.3		7.3	7.3
Actuated g/C Ratio	0.14	0.44	0.17	0.53	0.18	0.18		0.18	0.18
v/c Ratio	0.03	0.45	0.26	0.37	0.15	0.08		0.21	0.04
Control Delay	20.0	9.4	21.4	6.2	19.0	0.4		19.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	20.0	9.4	21.4	6.2	19.0	0.4		19.5	0.2
LOS	B	A	C	A	B	A		B	A
Approach Delay		9.5		7.2				14.8	
Approach LOS		A		A				B	

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 39.9			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.45			
Intersection Signal Delay: 8.6		Intersection LOS: A	
Intersection Capacity Utilization 44.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street





Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBT	SBR
Lane Group Flow (vph)	11	1195	67	959	33	38	49	16
v/c Ratio	0.03	0.45	0.26	0.37	0.15	0.08	0.21	0.04
Control Delay	20.0	9.4	21.4	6.2	19.0	0.4	19.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	9.4	21.4	6.2	19.0	0.4	19.5	0.2
Queue Length 50th (ft)	1	63	17	30	8	0	12	0
Queue Length 95th (ft)	7	94	47	93	27	0	35	0
Internal Link Dist (ft)		362		428			378	
Turn Bay Length (ft)	220		125		115	115		110
Base Capacity (vph)	399	3370	278	3210	638	898	681	844
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.35	0.24	0.30	0.05	0.04	0.07	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1151	8	65	884	47	32	0	37	47	1	16
Future Volume (veh/h)	11	1151	8	65	884	47	32	0	37	47	1	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	11	1187	8	67	911	48	33	0	38	48	1	16
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	42	2479	17	110	2108	111	360	257	218	401	6	218
Arrive On Green	0.01	0.39	0.39	0.07	0.45	0.45	0.15	0.00	0.15	0.15	0.15	0.15
Sat Flow, veh/h	2910	6293	42	1594	4705	247	1318	1772	1502	1337	43	1502
Grp Volume(v), veh/h	11	862	333	67	624	335	33	0	38	49	0	16
Grp Sat Flow(s),veh/h/ln	1455	1524	1764	1594	1612	1727	1318	1772	1502	1379	0	1502
Q Serve(g_s), s	0.1	4.8	4.9	1.4	4.6	4.6	0.8	0.0	0.8	1.0	0.0	0.3
Cycle Q Clear(g_c), s	0.1	4.8	4.9	1.4	4.6	4.6	1.9	0.0	0.8	1.1	0.0	0.3
Prop In Lane	1.00		0.02	1.00		0.14	1.00		1.00	0.98		1.00
Lane Grp Cap(c), veh/h	42	1801	695	110	1445	774	360	257	218	407	0	218
V/C Ratio(X)	0.26	0.48	0.48	0.61	0.43	0.43	0.09	0.00	0.17	0.12	0.00	0.07
Avail Cap(c_a), veh/h	431	2722	1051	301	2052	1099	915	1004	851	987	0	851
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.8	7.8	7.8	15.6	6.5	6.5	13.9	0.0	12.9	13.0	0.0	12.7
Incr Delay (d2), s/veh	3.2	0.2	0.5	5.4	0.2	0.4	0.1	0.0	0.4	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.1	1.3	0.6	1.0	1.1	0.2	0.0	0.2	0.3	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.0	8.0	8.3	21.0	6.7	6.9	14.0	0.0	13.3	13.2	0.0	12.9
LnGrp LOS	B	A	A	C	A	A	B	A	B	B	A	B
Approach Vol, veh/h		1206			1026			71			65	
Approach Delay, s/veh		8.2			7.7			13.6			13.1	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	6.9	18.1		9.5	5.0	19.9				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		19.5	6.5	20.5		19.5	5.1	21.9				
Max Q Clear Time (g_c+I1), s		3.9	3.4	6.9		3.1	2.1	6.6				
Green Ext Time (p_c), s		0.1	0.0	6.7		0.2	0.0	5.7				

Intersection Summary	
HCM 6th Ctrl Delay	8.3
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.991					0.865
Flt Protected						
Satd. Flow (prot)	4774	0	0	4818	0	1526
Flt Permitted						
Satd. Flow (perm)	4774	0	0	4818	0	1526
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	1160	75	0	1017	0	45
Future Volume (vph)	1160	75	0	1017	0	45
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1221	79	0	1071	0	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1300	0	0	1071	0	47

Intersection Summary

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1160	75	0	1017	0	45
Future Vol, veh/h	1160	75	0	1017	0	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1221	79	0	1071	0	47

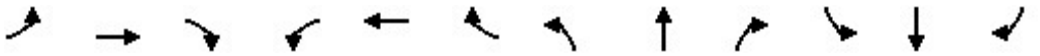
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	650
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	353
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	353
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	16.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	353	-	-	-
HCM Lane V/C Ratio	0.134	-	-	-
HCM Control Delay (s)	16.8	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.5	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.977	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5931	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5931	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			255			293			95		36	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



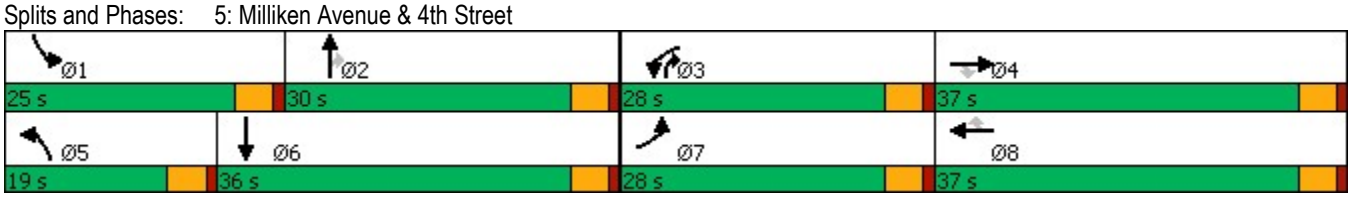
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	274	977	283	542	722	278	207	882	379	390	855	152
Future Volume (vph)	274	977	283	542	722	278	207	882	379	390	855	152
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	288	1028	298	571	760	293	218	928	399	411	900	160
Shared Lane Traffic (%)												
Lane Group Flow (vph)	288	1028	298	571	760	293	218	928	399	411	1060	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	274	977	283	542	722	278	207	882	379	390	855
Future Volume (vph)	274	977	283	542	722	278	207	882	379	390	855
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	28.0	37.0	37.0	28.0	37.0	37.0	19.0	30.0	28.0	25.0	36.0
Total Split (%)	23.3%	30.8%	30.8%	23.3%	30.8%	30.8%	15.8%	25.0%	23.3%	20.8%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	16.9	31.1	31.1	23.6	37.8	37.8	13.0	23.9	52.0	19.4	30.3
Actuated g/C Ratio	0.15	0.27	0.27	0.20	0.33	0.33	0.11	0.21	0.45	0.17	0.26
v/c Ratio	0.69	0.80	0.51	0.97	0.48	0.43	0.67	0.74	0.55	0.85	0.67
Control Delay	56.1	45.2	10.3	77.7	33.6	5.8	61.1	47.6	21.2	64.8	39.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.1	45.2	10.3	77.7	33.6	5.8	61.1	47.6	21.2	64.8	39.8
LOS	E	D	B	E	C	A	E	D	C	E	D
Approach Delay		40.7			44.1			42.7			46.8
Approach LOS		D			D			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 116	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 43.5	Intersection LOS: D
Intersection Capacity Utilization 80.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 5: Milliken Avenue & 4th Street

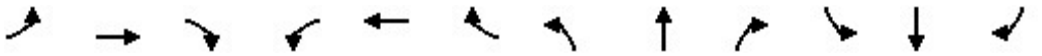


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	288	1028	298	571	760	293	218	928	399	411	1060
v/c Ratio	0.69	0.80	0.51	0.97	0.48	0.43	0.67	0.74	0.55	0.85	0.67
Control Delay	56.1	45.2	10.3	77.7	33.6	5.8	61.1	47.6	21.2	64.8	39.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.1	45.2	10.3	77.7	33.6	5.8	61.1	47.6	21.2	64.8	39.8
Queue Length 50th (ft)	110	271	25	~232	172	0	84	195	169	160	206
Queue Length 95th (ft)	151	326	105	#352	227	66	126	235	268	#239	247
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	588	1354	605	588	1570	686	362	1339	724	512	1646
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.76	0.49	0.97	0.48	0.43	0.60	0.69	0.55	0.80	0.64

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



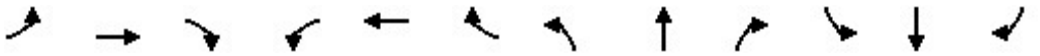
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	274	977	283	542	722	278	207	882	379	390	855	152
Future Volume (veh/h)	274	977	283	542	722	278	207	882	379	390	855	152
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	288	1028	298	571	760	293	218	928	399	411	900	160
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	350	1245	386	595	1652	513	271	1353	641	464	1516	265
Arrive On Green	0.12	0.26	0.26	0.20	0.34	0.34	0.09	0.22	0.22	0.16	0.29	0.29
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	2910	6095	1502	2910	5259	919
Grp Volume(v), veh/h	288	1028	298	571	760	293	218	928	399	411	780	280
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1455	1524	1502	1455	1524	1606
Q Serve(g_s), s	11.1	23.0	21.1	22.3	14.1	18.3	8.4	16.1	23.8	15.9	16.8	17.2
Cycle Q Clear(g_c), s	11.1	23.0	21.1	22.3	14.1	18.3	8.4	16.1	23.8	15.9	16.8	17.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.57
Lane Grp Cap(c), veh/h	350	1245	386	595	1652	513	271	1353	641	464	1318	463
V/C Ratio(X)	0.82	0.83	0.77	0.96	0.46	0.57	0.81	0.69	0.62	0.89	0.59	0.60
Avail Cap(c_a), veh/h	595	1369	425	595	1652	513	367	1353	641	519	1318	463
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.3	40.2	39.5	45.2	29.5	30.9	51.1	41.0	25.7	47.3	35.1	35.2
Incr Delay (d2), s/veh	4.8	4.0	7.8	26.9	0.2	1.5	9.0	1.5	1.9	15.6	0.7	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	9.5	8.6	10.2	5.5	6.8	3.4	6.1	8.7	6.7	6.3	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.2	44.2	47.3	72.2	29.7	32.5	60.1	42.5	27.6	62.8	35.8	37.4
LnGrp LOS	D	D	D	E	C	C	E	D	C	E	D	D
Approach Vol, veh/h		1614			1624			1545			1471	
Approach Delay, s/veh		46.5			45.1			41.1			43.7	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.8	30.0	28.0	34.1	15.2	37.6	18.3	43.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	20.5	25.5	23.5	32.5	14.5	31.5	23.5	32.5
Max Q Clear Time (g_c+I1), s	17.9	25.8	24.3	25.0	10.4	19.2	13.1	20.3
Green Ext Time (p_c), s	0.4	0.0	0.0	4.5	0.3	5.7	0.7	5.0

Intersection Summary	
HCM 6th Ctrl Delay	44.2
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.945	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	3035	1365
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	3035	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			163			270			372		91	402
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



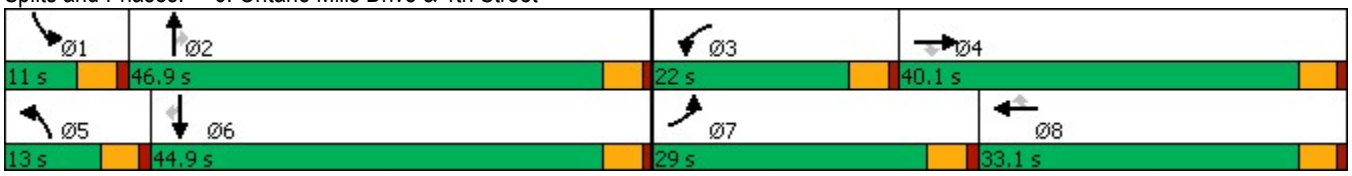
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	730	1128	156	410	905	420	182	318	488	68	632	812
Future Volume (vph)	730	1128	156	410	905	420	182	318	488	68	632	812
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	760	1175	163	427	943	438	190	331	508	71	658	846
Shared Lane Traffic (%)												45%
Lane Group Flow (vph)	760	1175	163	427	943	438	190	331	508	71	1039	465

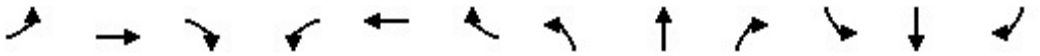
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	730	1128	156	410	905	420	182	318	488	68	632	812
Future Volume (vph)	730	1128	156	410	905	420	182	318	488	68	632	812
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	29.0	40.1	40.1	22.0	33.1	33.1	13.0	46.9	46.9	11.0	44.9	44.9
Total Split (%)	24.2%	33.4%	33.4%	18.3%	27.6%	27.6%	10.8%	39.1%	39.1%	9.2%	37.4%	37.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	24.5	35.3	35.3	17.5	28.3	28.3	8.5	42.4	42.4	6.5	40.4	40.4
Actuated g/C Ratio	0.20	0.29	0.29	0.15	0.24	0.24	0.07	0.35	0.35	0.05	0.34	0.34
v/c Ratio	1.29	0.83	0.29	1.01	0.83	0.78	1.70	0.28	0.66	0.84	0.96	0.64
Control Delay	180.0	45.3	6.2	97.7	50.6	26.8	381.1	28.6	13.0	115.9	54.8	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	180.0	45.3	6.2	97.7	50.6	26.8	381.1	28.6	13.0	115.9	54.8	9.8
LOS	F	D	A	F	D	C	F	C	B	F	D	A
Approach Delay		91.0			56.0			86.0			44.3	
Approach LOS		F			E			F			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.70	
Intersection Signal Delay: 69.2	Intersection LOS: E
Intersection Capacity Utilization 97.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 6: Ontario Mills Drive & 4th Street



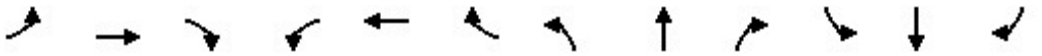


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	760	1175	163	427	943	438	190	331	508	71	1039	465
v/c Ratio	1.29	0.83	0.29	1.01	0.83	0.78	1.70	0.28	0.66	0.84	0.96	0.64
Control Delay	180.0	45.3	6.2	97.7	50.6	26.8	381.1	28.6	13.0	115.9	54.8	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	180.0	45.3	6.2	97.7	50.6	26.8	381.1	28.6	13.0	115.9	54.8	9.8
Queue Length 50th (ft)	~386	310	0	~175	254	125	~216	96	79	56	401	37
Queue Length 95th (ft)	#508	368	50	#283	309	#263	#366	134	206	#144	#553	157
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	591	1432	560	422	1151	564	112	1187	771	85	1084	727
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.29	0.82	0.29	1.01	0.82	0.78	1.70	0.28	0.66	0.84	0.96	0.64

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



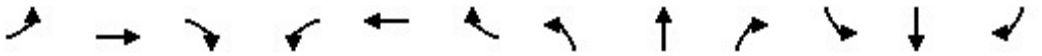
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	730	1128	156	410	905	420	182	318	488	68	632	812
Future Volume (veh/h)	730	1128	156	410	905	420	182	318	488	68	632	812
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	760	1175	162	427	943	438	190	331	508	71	658	846
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	594	1435	445	424	1153	358	113	1190	531	86	597	1011
Arrive On Green	0.20	0.30	0.30	0.15	0.24	0.24	0.07	0.35	0.35	0.05	0.34	0.34
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	1594	3367	1502	1594	1772	3003
Grp Volume(v), veh/h	760	1175	162	427	943	438	190	331	508	71	658	846
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1594	1683	1502	1594	1772	1502
Q Serve(g_s), s	24.5	27.1	10.2	17.5	22.1	28.6	8.5	8.5	39.7	5.3	40.4	31.2
Cycle Q Clear(g_c), s	24.5	27.1	10.2	17.5	22.1	28.6	8.5	8.5	39.7	5.3	40.4	31.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	594	1435	445	424	1153	358	113	1190	531	86	597	1011
V/C Ratio(X)	1.28	0.82	0.36	1.01	0.82	1.22	1.68	0.28	0.96	0.82	1.10	0.84
Avail Cap(c_a), veh/h	594	1435	445	424	1153	358	113	1190	531	86	597	1011
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.8	39.2	33.3	51.3	43.2	45.7	55.8	27.8	37.9	56.2	39.8	36.8
Incr Delay (d2), s/veh	138.2	3.9	0.5	45.2	4.7	123.2	342.6	0.1	28.6	44.7	68.3	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.2	11.1	3.8	9.0	9.3	22.8	14.2	3.4	18.5	3.2	28.6	12.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	186.0	43.1	33.8	96.5	48.0	168.9	398.3	28.0	66.5	100.9	108.1	43.0
LnGrp LOS	F	D	C	F	D	F	F	C	E	F	F	D
Approach Vol, veh/h		2097			1808			1029			1575	
Approach Delay, s/veh		94.2			88.7			115.4			72.8	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	46.9	22.0	40.1	13.0	44.9	29.0	33.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	42.4	17.5	35.6	8.5	40.4	24.5	28.6
Max Q Clear Time (g_c+I1), s	7.3	41.7	19.5	29.1	10.5	42.4	26.5	30.6
Green Ext Time (p_c), s	0.0	0.3	0.0	4.3	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	90.8
HCM 6th LOS	F

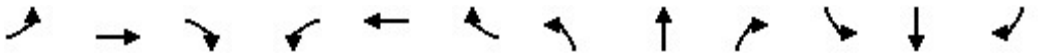
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.982			0.939				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.996	
Satd. Flow (prot)	2891	4818	1500	1583	4731	0	1583	3148	0	1504	1670	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.996	
Satd. Flow (perm)	2891	4818	1500	1583	4731	0	1583	3148	0	1504	1670	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			99		18			50				426
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



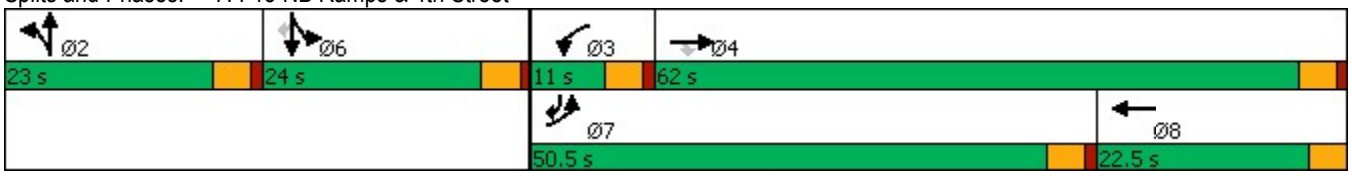
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1050	502	93	32	533	73	95	68	47	71	76	1134
Future Volume (vph)	1050	502	93	32	533	73	95	68	47	71	76	1134
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1117	534	99	34	567	78	101	72	50	76	81	1206
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	1117	534	99	34	645	0	101	122	0	68	89	1206

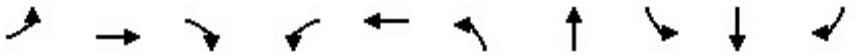
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	1050	502	93	32	533	95	68	71	76	1134
Future Volume (vph)	1050	502	93	32	533	95	68	71	76	1134
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	50.5	62.0	62.0	11.0	22.5	23.0	23.0	24.0	24.0	50.5
Total Split (%)	42.1%	51.7%	51.7%	9.2%	18.8%	19.2%	19.2%	20.0%	20.0%	42.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	46.3	61.4	61.4	6.3	17.9	12.0	12.0	10.9	10.9	61.7
Actuated g/C Ratio	0.44	0.59	0.59	0.06	0.17	0.12	0.12	0.10	0.10	0.59
v/c Ratio	0.87	0.19	0.11	0.35	0.78	0.55	0.30	0.43	0.51	0.69
Control Delay	36.5	11.9	3.3	60.7	48.3	56.4	28.0	53.7	55.7	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.5	11.9	3.3	60.7	48.3	56.4	28.0	53.7	55.7	11.8
LOS	D	B	A	E	D	E	C	D	E	B
Approach Delay		27.1			48.9		40.9		16.8	
Approach LOS		C			D		D		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 104.2	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 28.1	Intersection LOS: C
Intersection Capacity Utilization 71.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street





Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1117	534	99	34	645	101	122	68	89	1206
v/c Ratio	0.87	0.19	0.11	0.35	0.78	0.55	0.30	0.43	0.51	0.69
Control Delay	36.5	11.9	3.3	60.7	48.3	56.4	28.0	53.7	55.7	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.5	11.9	3.3	60.7	48.3	56.4	28.0	53.7	55.7	11.8
Queue Length 50th (ft)	344	63	0	22	147	65	23	46	60	194
Queue Length 95th (ft)	#564	103	27	60	213	125	53	97	120	315
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	1284	2840	924	99	882	283	603	283	314	1737
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.19	0.11	0.34	0.73	0.36	0.20	0.24	0.28	0.69

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1050	502	93	32	533	73	95	68	47	71	76	1134
Future Volume (veh/h)	1050	502	93	32	533	73	95	68	47	71	76	1134
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	1117	534	99	34	567	78	101	72	50	76	81	1206
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1183	2593	805	47	686	93	137	170	108	288	321	1764
Arrive On Green	0.41	0.54	0.54	0.03	0.16	0.16	0.09	0.09	0.09	0.18	0.18	0.18
Sat Flow, veh/h	2910	4837	1502	1594	4307	584	1594	1973	1256	1594	1772	3003
Grp Volume(v), veh/h	1117	534	99	34	423	222	101	60	62	76	81	1206
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1594	1612	1667	1594	1683	1546	1594	1772	1502
Q Serve(g_s), s	39.8	6.2	3.5	2.3	13.7	14.0	6.7	3.7	4.1	4.4	4.2	19.5
Cycle Q Clear(g_c), s	39.8	6.2	3.5	2.3	13.7	14.0	6.7	3.7	4.1	4.4	4.2	19.5
Prop In Lane	1.00		1.00	1.00		0.35	1.00		0.81	1.00		1.00
Lane Grp Cap(c), veh/h	1183	2593	805	47	514	266	137	145	133	288	321	1764
V/C Ratio(X)	0.94	0.21	0.12	0.72	0.82	0.84	0.73	0.42	0.46	0.26	0.25	0.68
Avail Cap(c_a), veh/h	1243	2593	805	96	569	294	274	289	265	288	321	1764
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.8	13.0	12.4	51.8	43.8	43.9	48.0	46.7	46.8	37.9	37.9	15.3
Incr Delay (d2), s/veh	14.0	0.0	0.1	18.5	8.7	17.5	7.4	1.9	2.5	0.5	0.4	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.8	2.2	1.2	1.2	6.0	7.0	2.9	1.6	1.7	1.8	1.9	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.8	13.1	12.5	70.3	52.5	61.4	55.4	48.6	49.3	38.4	38.3	16.4
LnGrp LOS	D	B	B	E	D	E	E	D	D	D	D	B
Approach Vol, veh/h		1750			679			223			1363	
Approach Delay, s/veh		33.3			56.3			51.9			19.0	
Approach LOS		C			E			D			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		13.8	7.7	62.3		24.0	48.3	21.7				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		18.5	6.5	57.5		19.5	46.0	* 19				
Max Q Clear Time (g_c+I1), s		8.7	4.3	8.2		21.5	41.8	16.0				
Green Ext Time (p_c), s		0.6	0.0	4.6		0.0	1.9	1.2				

Intersection Summary	
HCM 6th Ctrl Delay	33.3
HCM 6th LOS	C

Notes

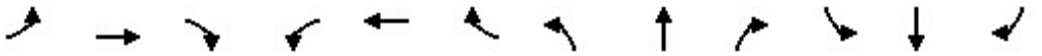
User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

User approved changes to right turn type.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.903				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3028	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3028	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		50				236			245			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



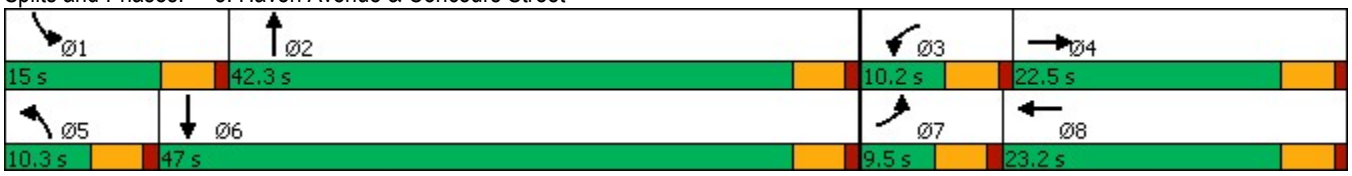
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	12	25	47	126	54	60	45	1600	230	43	1517	31
Future Volume (vph)	12	25	47	126	54	60	45	1600	230	43	1517	31
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	13	27	50	134	57	64	48	1702	245	46	1614	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	77	0	134	57	64	48	1702	245	46	1614	33

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	12	25	126	54	60	45	1600	230	43	1517	31
Future Volume (vph)	12	25	126	54	60	45	1600	230	43	1517	31
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	10.2	23.2		10.3	42.3		15.0	47.0	
Total Split (%)	10.6%	25.0%	11.3%	25.8%		11.4%	47.0%		16.7%	52.2%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.4	6.7	6.2	12.8	64.3	6.2	39.1	64.3	6.9	39.9	64.3
Actuated g/C Ratio	0.08	0.10	0.10	0.20	1.00	0.10	0.61	1.00	0.11	0.62	1.00
v/c Ratio	0.05	0.21	0.36	0.09	0.04	0.17	0.46	0.16	0.15	0.43	0.02
Control Delay	34.8	17.7	35.6	26.7	0.1	34.5	11.1	0.2	32.6	10.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.8	17.7	35.6	26.7	0.1	34.5	11.1	0.2	32.6	10.1	0.0
LOS	C	B	D	C	A	C	B	A	C	B	A
Approach Delay		20.2		24.7			10.3			10.5	
Approach LOS		C		C			B			B	

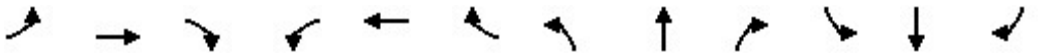
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 64.3	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.46	
Intersection Signal Delay: 11.5	Intersection LOS: B
Intersection Capacity Utilization 41.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	13	77	134	57	64	48	1702	245	46	1614	33
v/c Ratio	0.05	0.21	0.36	0.09	0.04	0.17	0.46	0.16	0.15	0.43	0.02
Control Delay	34.8	17.7	35.6	26.7	0.1	34.5	11.1	0.2	32.6	10.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.8	17.7	35.6	26.7	0.1	34.5	11.1	0.2	32.6	10.1	0.0
Queue Length 50th (ft)	3	6	21	11	0	10	145	0	10	131	0
Queue Length 95th (ft)	11	26	42	31	0	28	195	0	26	169	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	242	949	376	1052	1500	281	3888	1500	509	4218	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.08	0.36	0.05	0.04	0.17	0.44	0.16	0.09	0.38	0.02

Intersection Summary



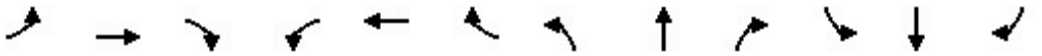
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	25	47	126	54	60	45	1600	230	43	1517	31
Future Volume (veh/h)	12	25	47	126	54	60	45	1600	230	43	1517	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	13	27	50	134	57	0	48	1702	0	46	1614	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	47	132	118	304	468		135	2969		132	2961	
Arrive On Green	0.02	0.08	0.08	0.08	0.14	0.00	0.05	0.49	0.00	0.05	0.49	0.00
Sat Flow, veh/h	2910	1683	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	13	27	50	134	57	0	48	1702	0	46	1614	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	0.3	0.9	1.8	1.9	0.9	0.0	0.9	11.4	0.0	0.9	10.7	0.0
Cycle Q Clear(g_c), s	0.3	0.9	1.8	1.9	0.9	0.0	0.9	11.4	0.0	0.9	10.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	47	132	118	304	468		135	2969		132	2961	
V/C Ratio(X)	0.27	0.20	0.42	0.44	0.12		0.35	0.57		0.35	0.55	
Avail Cap(c_a), veh/h	253	526	469	392	1093		293	4000		531	4498	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.0	24.9	25.3	25.4	21.7	0.0	26.6	10.5	0.0	26.7	10.4	0.0
Incr Delay (d2), s/veh	3.1	0.8	2.4	1.0	0.1	0.0	1.6	0.2	0.0	1.6	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.4	0.7	0.6	0.3	0.0	0.3	3.2	0.0	0.3	3.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.1	25.6	27.7	26.4	21.8	0.0	28.2	10.7	0.0	28.3	10.5	0.0
LnGrp LOS	C	C	C	C	C		C	B		C	B	
Approach Vol, veh/h		90			191	A		1750	A		1660	A
Approach Delay, s/veh		27.6			25.1			11.2			11.0	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	32.6	8.9	9.0	7.2	32.5	5.4	12.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	37.8	5.7	18.0	5.8	42.5	5.0	18.7
Max Q Clear Time (g_c+I1), s	2.9	13.4	3.9	3.8	2.9	12.7	2.3	2.9
Green Ext Time (p_c), s	0.0	14.5	0.1	0.3	0.0	15.3	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	12.2
HCM 6th LOS	B

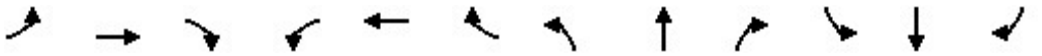
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.995									0.937	
Flt Protected	0.950	0.954					0.950					
Satd. Flow (prot)	1593	1591	0	0	1765	0	1676	4818	0	1765	4514	0
Flt Permitted	0.950	0.954					0.950					
Satd. Flow (perm)	1593	1591	0	0	1765	0	1676	4818	0	1765	4514	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		143									184	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



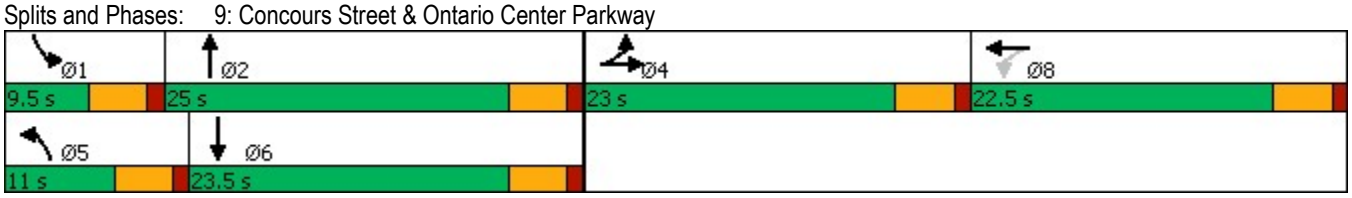
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	157	0	3	0	0	0	35	303	1	0	226	166
Future Volume (vph)	157	0	3	0	0	0	35	303	1	0	226	166
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	174	0	3	0	0	0	39	337	1	0	251	184
Shared Lane Traffic (%)	49%											
Lane Group Flow (vph)	89	88	0	0	0	0	39	338	0	0	435	0

Intersection Summary

Lane Group	EBL	EBT	NBL	NBT	SBT	Ø1	Ø8
Lane Configurations							
Traffic Volume (vph)	157	0	35	303	226		
Future Volume (vph)	157	0	35	303	226		
Turn Type	Split	NA	Prot	NA	NA		
Protected Phases	4	4	5	2	6	1	8
Permitted Phases							
Detector Phase	4	4	5	2	6		
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	9.5	22.5
Total Split (s)	23.0	23.0	11.0	25.0	23.5	9.5	22.5
Total Split (%)	28.8%	28.8%	13.8%	31.3%	29.4%	12%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		
Lead/Lag			Lead	Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	Min	Min	None	None
Act Effct Green (s)	7.6	7.6	6.3	16.2	14.6		
Actuated g/C Ratio	0.26	0.26	0.21	0.55	0.49		
v/c Ratio	0.22	0.17	0.11	0.13	0.19		
Control Delay	11.1	2.2	12.1	5.0	5.0		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	11.1	2.2	12.1	5.0	5.0		
LOS	B	A	B	A	A		
Approach Delay		6.7		5.8	5.0		
Approach LOS		A		A	A		

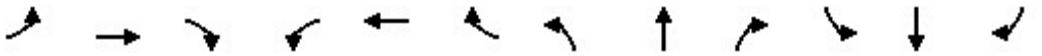
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 29.7	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.22	
Intersection Signal Delay: 5.6	Intersection LOS: A
Intersection Capacity Utilization 28.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	NBL	NBT	SBT
Lane Group Flow (vph)	89	88	39	338	435
v/c Ratio	0.22	0.17	0.11	0.13	0.19
Control Delay	11.1	2.2	12.1	5.0	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.1	2.2	12.1	5.0	5.0
Queue Length 50th (ft)	8	0	4	9	6
Queue Length 95th (ft)	43	12	25	20	34
Internal Link Dist (ft)		319		111	176
Turn Bay Length (ft)	170		115		
Base Capacity (vph)	1025	1074	378	3639	3261
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.09	0.08	0.10	0.09	0.13

Intersection Summary



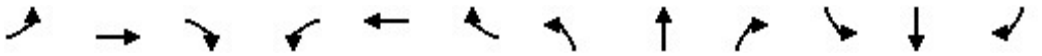
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	0	3	0	0	0	35	303	1	0	226	166
Future Volume (veh/h)	157	0	3	0	0	0	35	303	1	0	226	166
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	177	0	0	0	0	0	39	337	1	0	251	184
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	476	250	0	0	7	0	80	2500	7	7	890	415
Arrive On Green	0.14	0.00	0.00	0.00	0.00	0.00	0.05	0.50	0.50	0.00	0.28	0.28
Sat Flow, veh/h	3375	1772	0	0	1772	0	1688	4979	15	1688	3225	1502
Grp Volume(v), veh/h	177	0	0	0	0	0	39	218	120	0	251	184
Grp Sat Flow(s),veh/h/ln	1688	1772	0	0	1772	0	1688	1612	1769	1688	1612	1502
Q Serve(g_s), s	1.2	0.0	0.0	0.0	0.0	0.0	0.6	0.9	0.9	0.0	1.5	2.5
Cycle Q Clear(g_c), s	1.2	0.0	0.0	0.0	0.0	0.0	0.6	0.9	0.9	0.0	1.5	2.5
Prop In Lane	1.00		0.00	0.00		0.00	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	476	250	0	0	7	0	80	1619	888	7	890	415
V/C Ratio(X)	0.37	0.00	0.00	0.00	0.00	0.00	0.49	0.13	0.13	0.00	0.28	0.44
Avail Cap(c_a), veh/h	2477	1301	0	0	1265	0	435	2623	1439	335	2431	1132
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	9.8	0.0	0.0	0.0	0.0	0.0	11.7	3.4	3.4	0.0	7.2	7.5
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.1	0.0	0.2	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.1	0.0	0.3	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.3	0.0	0.0	0.0	0.0	0.0	16.2	3.4	3.4	0.0	7.3	8.3
LnGrp LOS	B	A	A	A	A	A	B	A	A	A	A	A
Approach Vol, veh/h		177			0			377			435	
Approach Delay, s/veh		10.3			0.0			4.7			7.7	
Approach LOS		B						A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	17.2		8.1	5.7	11.5		0.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	20.5		18.5	6.5	19.0		18.0				
Max Q Clear Time (g_c+I1), s	0.0	2.9		3.2	2.6	4.5		0.0				
Green Ext Time (p_c), s	0.0	1.9		0.5	0.0	2.4		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		7.0
HCM 6th LOS		A

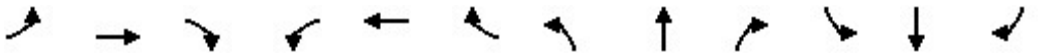
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			304			182			213			284
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



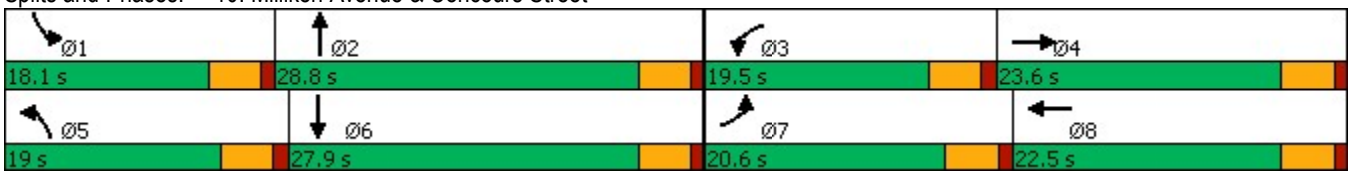
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	346	156	283	261	102	161	328	1000	243	281	1004	280
Future Volume (vph)	346	156	283	261	102	161	328	1000	243	281	1004	280
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	372	168	304	281	110	173	353	1075	261	302	1080	301
Shared Lane Traffic (%)												
Lane Group Flow (vph)	372	168	304	281	110	173	353	1075	261	302	1080	301

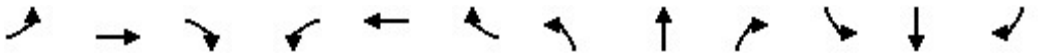
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	346	156	283	261	102	161	328	1000	243	281	1004	280
Future Volume (vph)	346	156	283	261	102	161	328	1000	243	281	1004	280
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	20.6	23.6		19.5	22.5		19.0	28.8		18.1	27.9	
Total Split (%)	22.9%	26.2%		21.7%	25.0%		21.1%	32.0%		20.1%	31.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	16.5	9.7	74.7	12.3	8.1	74.7	13.3	22.3	74.7	12.2	21.2	74.7
Actuated g/C Ratio	0.22	0.13	1.00	0.16	0.11	1.00	0.18	0.30	1.00	0.16	0.28	1.00
v/c Ratio	0.58	0.39	0.20	0.59	0.30	0.12	0.69	0.59	0.17	0.64	0.63	0.20
Control Delay	32.6	34.0	0.3	35.5	34.9	0.2	37.7	24.5	0.3	37.3	25.7	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	34.0	0.3	35.5	34.9	0.2	37.7	24.5	0.3	37.3	25.7	0.3
LOS	C	C	A	D	C	A	D	C	A	D	C	A
Approach Delay		21.3			24.6			23.5			23.2	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 74.7	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 23.1	Intersection LOS: C
Intersection Capacity Utilization 57.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Milliken Avenue & Concours Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	372	168	304	281	110	173	353	1075	261	302	1080	301
v/c Ratio	0.58	0.39	0.20	0.59	0.30	0.12	0.69	0.59	0.17	0.64	0.63	0.20
Control Delay	32.6	34.0	0.3	35.5	34.9	0.2	37.7	24.5	0.3	37.3	25.7	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	34.0	0.3	35.5	34.9	0.2	37.7	24.5	0.3	37.3	25.7	0.3
Queue Length 50th (ft)	88	40	0	67	26	0	84	129	0	72	132	0
Queue Length 95th (ft)	139	72	0	108	52	0	135	173	0	118	177	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	666	869	1500	589	820	1500	569	2004	1500	534	1929	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.19	0.20	0.48	0.13	0.12	0.62	0.54	0.17	0.57	0.56	0.20

Intersection Summary

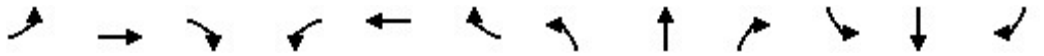
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	346	156	283	261	102	161	328	1000	243	281	1004	280
Future Volume (veh/h)	346	156	283	261	102	161	328	1000	243	281	1004	280
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	372	168	0	281	110	0	353	1075	0	302	1080	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	489	396		391	282		465	1862		410	1747	
Arrive On Green	0.17	0.12	0.00	0.13	0.08	0.00	0.16	0.31	0.00	0.14	0.29	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	372	168	0	281	110	0	353	1075	0	302	1080	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	7.3	2.8	0.0	5.5	1.8	0.0	6.9	8.9	0.0	5.9	9.2	0.0
Cycle Q Clear(g_c), s	7.3	2.8	0.0	5.5	1.8	0.0	6.9	8.9	0.0	5.9	9.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	489	396		391	282		465	1862		410	1747	
V/C Ratio(X)	0.76	0.42		0.72	0.39		0.76	0.58		0.74	0.62	
Avail Cap(c_a), veh/h	785	1078		732	1016		707	2482		663	2391	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.7	24.5	0.0	24.7	25.9	0.0	24.0	17.5	0.0	24.6	18.4	0.0
Incr Delay (d2), s/veh	2.5	0.7	0.0	2.5	0.9	0.0	2.6	0.3	0.0	2.6	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	1.1	0.0	1.9	0.7	0.0	2.4	2.9	0.0	2.1	3.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.1	25.2	0.0	27.2	26.8	0.0	26.6	17.8	0.0	27.2	18.8	0.0
LnGrp LOS	C	C		C	C		C	B		C	B	
Approach Vol, veh/h		540	A		391	A		1428	A		1382	A
Approach Delay, s/veh		25.8			27.1			19.9			20.6	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.9	22.7	12.5	11.5	14.0	21.6	14.5	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.6	24.3	15.0	19.1	14.5	23.4	16.1	18.0
Max Q Clear Time (g_c+I1), s	7.9	10.9	7.5	4.8	8.9	11.2	9.3	3.8
Green Ext Time (p_c), s	0.5	6.3	0.6	0.8	0.6	5.9	0.8	0.4

Intersection Summary	
HCM 6th Ctrl Delay	21.8
HCM 6th LOS	C

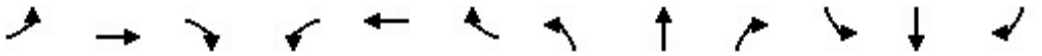
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			182			463			182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



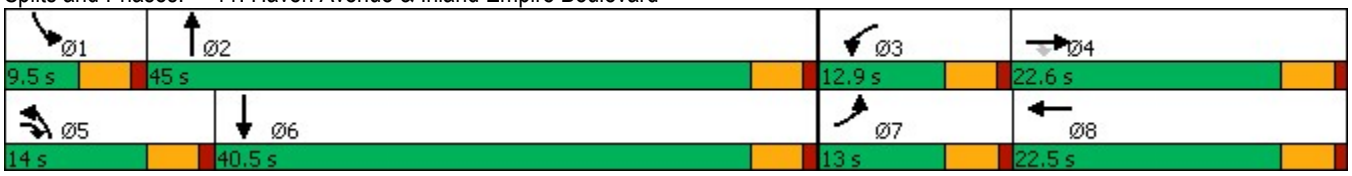
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	72	126	262	189	124	71	170	1728	570	55	1521	47
Future Volume (vph)	72	126	262	189	124	71	170	1728	570	55	1521	47
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	74	130	270	195	128	73	175	1781	588	57	1568	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	74	130	270	195	128	73	175	1781	588	57	1568	48

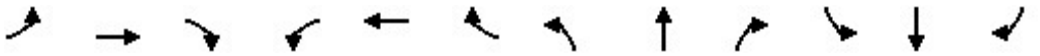
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	126	262	189	124	71	170	1728	570	55	1521	47
Future Volume (vph)	72	126	262	189	124	71	170	1728	570	55	1521	47
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	13.0	22.6	14.0	12.9	22.5		14.0	45.0		9.5	40.5	
Total Split (%)	14.4%	25.1%	15.6%	14.3%	25.0%		15.6%	50.0%		10.6%	45.0%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	7.3	8.5	19.0	8.2	9.2	73.8	8.9	41.1	73.8	5.2	32.7	73.8
Actuated g/C Ratio	0.10	0.12	0.26	0.11	0.12	1.00	0.12	0.56	1.00	0.07	0.44	1.00
v/c Ratio	0.26	0.34	0.61	0.45	0.31	0.05	0.50	0.53	0.39	0.28	0.58	0.03
Control Delay	36.3	35.2	24.1	36.9	34.3	0.1	38.4	12.7	0.8	40.2	17.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	35.2	24.1	36.9	34.3	0.1	38.4	12.7	0.8	40.2	17.1	0.0
LOS	D	D	C	D	C	A	D	B	A	D	B	A
Approach Delay		29.0			29.3			11.7			17.4	
Approach LOS		C			C			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 73.8	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 56.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	74	130	270	195	128	73	175	1781	588	57	1568	48
v/c Ratio	0.26	0.34	0.61	0.45	0.31	0.05	0.50	0.53	0.39	0.28	0.58	0.03
Control Delay	36.3	35.2	24.1	36.9	34.3	0.1	38.4	12.7	0.8	40.2	17.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	35.2	24.1	36.9	34.3	0.1	38.4	12.7	0.8	40.2	17.1	0.0
Queue Length 50th (ft)	18	32	83	33	31	0	43	172	0	14	163	0
Queue Length 95th (ft)	38	59	159	57	58	0	76	220	0	33	209	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	343	848	456	462	843	1500	384	3497	1500	201	3055	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.15	0.59	0.42	0.15	0.05	0.46	0.51	0.39	0.28	0.51	0.03

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	126	262	189	124	71	170	1728	570	55	1521	47
Future Volume (veh/h)	72	126	262	189	124	71	170	1728	570	55	1521	47
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	74	130	270	195	128	0	175	1781	0	57	1568	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	153	654	419	300	732		247	2700		135	2464	
Arrive On Green	0.05	0.19	0.19	0.08	0.22	0.00	0.09	0.44	0.00	0.05	0.40	0.00
Sat Flow, veh/h	2910	3367	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	74	130	270	195	128	0	175	1781	0	57	1568	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	1.8	2.4	11.8	3.6	2.3	0.0	4.4	17.2	0.0	1.4	15.4	0.0
Cycle Q Clear(g_c), s	1.8	2.4	11.8	3.6	2.3	0.0	4.4	17.2	0.0	1.4	15.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	153	654	419	300	732		247	2700		135	2464	
V/C Ratio(X)	0.48	0.20	0.64	0.65	0.17		0.71	0.66		0.42	0.64	
Avail Cap(c_a), veh/h	331	815	491	446	811		370	3302		195	2935	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.4	25.2	23.7	33.6	23.8	0.0	33.3	16.4	0.0	34.7	17.9	0.0
Incr Delay (d2), s/veh	2.4	0.1	2.2	2.4	0.1	0.0	3.7	0.4	0.0	2.1	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.0	4.2	1.2	0.9	0.0	1.6	5.5	0.0	0.5	5.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.8	25.4	25.9	36.0	23.9	0.0	37.0	16.7	0.0	36.8	18.2	0.0
LnGrp LOS	D	C	C	D	C		D	B		D	B	
Approach Vol, veh/h		474			323	A		1956	A		1625	A
Approach Delay, s/veh		27.5			31.2			18.6			18.9	
Approach LOS		C			C			B			B	

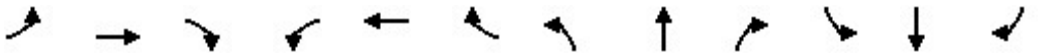
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	37.6	10.1	19.0	10.9	34.7	8.4	20.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	40.5	8.4	18.1	9.5	36.0	8.5	18.0
Max Q Clear Time (g_c+I1), s	3.4	19.2	5.6	13.8	6.4	17.4	3.8	4.3
Green Ext Time (p_c), s	0.0	13.9	0.2	0.7	0.2	11.2	0.1	0.5

Intersection Summary	
HCM 6th Ctrl Delay	20.6
HCM 6th LOS	C

Notes

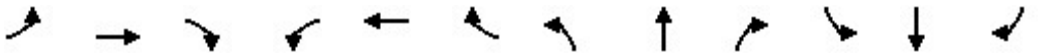
User approved changes to right turn type.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			281			193			552			193
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



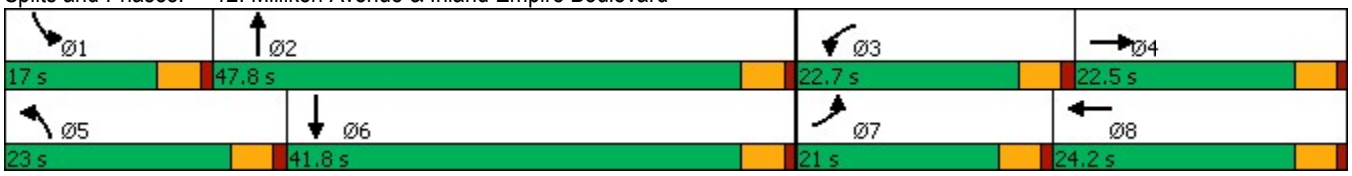
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	179	298	273	360	139	136	349	1198	794	143	1416	112
Future Volume (vph)	179	298	273	360	139	136	349	1198	794	143	1416	112
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	185	307	281	371	143	140	360	1235	819	147	1460	115
Shared Lane Traffic (%)												
Lane Group Flow (vph)	185	307	281	371	143	140	360	1235	819	147	1460	115

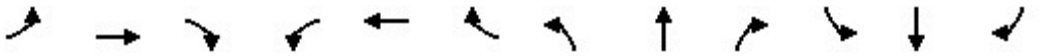
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	179	298	273	360	139	136	349	1198	794	143	1416	112
Future Volume (vph)	179	298	273	360	139	136	349	1198	794	143	1416	112
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	21.0	22.5		22.7	24.2		23.0	47.8		17.0	41.8	
Total Split (%)	19.1%	20.5%		20.6%	22.0%		20.9%	43.5%		15.5%	38.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	11.9	14.4	100.2	16.6	19.1	100.2	16.5	40.7	100.2	10.2	34.4	100.2
Actuated g/C Ratio	0.12	0.14	1.00	0.17	0.19	1.00	0.16	0.41	1.00	0.10	0.34	1.00
v/c Ratio	0.54	0.64	0.19	0.78	0.22	0.09	0.75	0.50	0.55	0.50	0.70	0.08
Control Delay	49.3	48.1	0.3	53.5	37.1	0.1	52.1	23.5	1.4	50.7	31.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.3	48.1	0.3	53.5	37.1	0.1	52.1	23.5	1.4	50.7	31.2	0.1
LOS	D	D	A	D	D	A	D	C	A	D	C	A
Approach Delay		31.0			38.5			20.3			30.8	
Approach LOS		C			D			C			C	

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 100.2	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 27.2	Intersection LOS: C
Intersection Capacity Utilization 69.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	185	307	281	371	143	140	360	1235	819	147	1460	115
v/c Ratio	0.54	0.64	0.19	0.78	0.22	0.09	0.75	0.50	0.55	0.50	0.70	0.08
Control Delay	49.3	48.1	0.3	53.5	37.1	0.1	52.1	23.5	1.4	50.7	31.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.3	48.1	0.3	53.5	37.1	0.1	52.1	23.5	1.4	50.7	31.2	0.1
Queue Length 50th (ft)	62	106	0	126	43	0	121	175	0	50	247	0
Queue Length 95th (ft)	98	153	0	#195	75	0	178	225	0	84	302	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	483	611	1500	533	691	1500	542	2689	1500	366	2295	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.50	0.19	0.70	0.21	0.09	0.66	0.46	0.55	0.40	0.64	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	298	273	360	139	136	349	1198	794	143	1416	112
Future Volume (veh/h)	179	298	273	360	139	136	349	1198	794	143	1416	112
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	185	307	0	371	143	0	360	1235	0	147	1460	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	259	424		453	648		443	2621		213	2140	
Arrive On Green	0.09	0.13	0.00	0.16	0.19	0.00	0.15	0.43	0.00	0.07	0.35	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	185	307	0	371	143	0	360	1235	0	147	1460	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	5.2	7.3	0.0	10.3	3.0	0.0	10.0	12.1	0.0	4.1	17.1	0.0
Cycle Q Clear(g_c), s	5.2	7.3	0.0	10.3	3.0	0.0	10.0	12.1	0.0	4.1	17.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	259	424		453	648		443	2621		213	2140	
V/C Ratio(X)	0.71	0.72		0.82	0.22		0.81	0.47		0.69	0.68	
Avail Cap(c_a), veh/h	574	724		633	793		643	3154		435	2717	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	37.1	35.2	0.0	34.2	28.5	0.0	34.3	17.1	0.0	37.8	23.2	0.0
Incr Delay (d2), s/veh	3.6	2.4	0.0	5.9	0.2	0.0	5.1	0.1	0.0	3.9	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	3.1	0.0	3.9	1.2	0.0	3.8	4.0	0.0	1.6	5.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.7	37.5	0.0	40.1	28.7	0.0	39.5	17.2	0.0	41.8	23.7	0.0
LnGrp LOS	D	D		D	C		D	B		D	C	
Approach Vol, veh/h		492	A		514	A		1595	A		1607	A
Approach Delay, s/veh		38.7			36.9			22.2			25.3	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	40.5	17.5	15.0	17.2	33.9	12.0	20.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	43.3	18.2	18.0	18.5	37.3	16.5	19.7
Max Q Clear Time (g_c+I1), s	6.1	14.1	12.3	9.3	12.0	19.1	7.2	5.0
Green Ext Time (p_c), s	0.2	10.8	0.7	1.2	0.7	10.3	0.4	0.6

Intersection Summary	
HCM 6th Ctrl Delay	27.1
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.925	0.850				
Flt Protected	0.976					
Satd. Flow (prot)	2919	1365	6071	0	0	6071
Flt Permitted	0.976					
Satd. Flow (perm)	2919	1365	6071	0	0	6071
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	6	6				
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

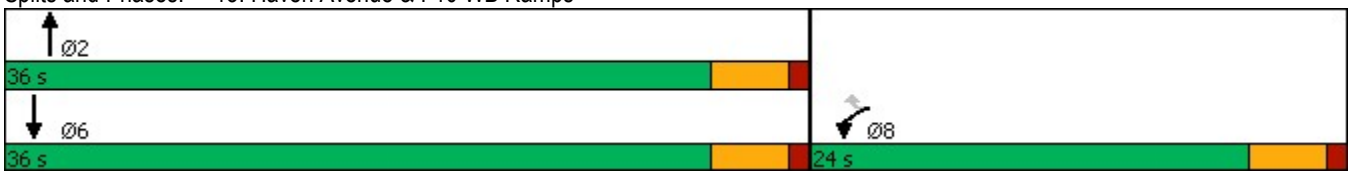
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	242	484	1945	0	0	1297
Future Volume (vph)	242	484	1945	0	0	1297
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.98	0.98	0.98	0.92	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	247	494	1985	0	0	1323
Shared Lane Traffic (%)		50%				
Lane Group Flow (vph)	494	247	1985	0	0	1323

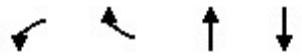
Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	242	484	1945	1297
Future Volume (vph)	242	484	1945	1297
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	36.0	36.0
Total Split (%)	40.0%	40.0%	60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	14.9	14.9	30.5	30.5
Actuated g/C Ratio	0.27	0.27	0.56	0.56
v/c Ratio	0.61	0.65	0.59	0.39
Control Delay	20.7	26.2	9.3	7.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.7	26.2	9.3	7.7
LOS	C	C	A	A
Approach Delay	22.5		9.3	7.7
Approach LOS	C		A	A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 54.5	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 11.2	Intersection LOS: B
Intersection Capacity Utilization 69.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps





Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	494	247	1985	1323
v/c Ratio	0.61	0.65	0.59	0.39
Control Delay	20.7	26.2	9.3	7.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.7	26.2	9.3	7.7
Queue Length 50th (ft)	72	76	111	63
Queue Length 95th (ft)	112	147	168	99
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	1060	498	3551	3551
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.47	0.50	0.56	0.37

Intersection Summary

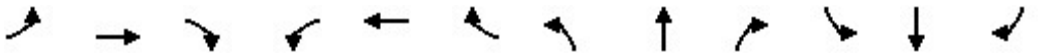
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	242	484	1945	0	0	1297
Future Volume (veh/h)	242	484	1945	0	0	1297
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1673	1772	1772	0	0	1772
Adj Flow Rate, veh/h	247	494	1985	0	0	1323
Peak Hour Factor	0.98	0.98	0.98	0.92	0.98	0.98
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	384	723	3448	0	0	3448
Arrive On Green	0.24	0.24	0.57	0.00	0.00	0.57
Sat Flow, veh/h	1594	3003	6592	0	0	6592
Grp Volume(v), veh/h	247	494	1985	0	0	1323
Grp Sat Flow(s),veh/h/ln	1594	1502	1524	0	0	1524
Q Serve(g_s), s	6.5	7.0	9.8	0.0	0.0	5.6
Cycle Q Clear(g_c), s	6.5	7.0	9.8	0.0	0.0	5.6
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	384	723	3448	0	0	3448
V/C Ratio(X)	0.64	0.68	0.58	0.00	0.00	0.38
Avail Cap(c_a), veh/h	668	1259	4129	0	0	4129
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	15.9	16.0	6.5	0.0	0.0	5.6
Incr Delay (d2), s/veh	1.8	1.2	0.2	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	2.2	2.0	0.0	0.0	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.7	17.2	6.7	0.0	0.0	5.7
LnGrp LOS	B	B	A	A	A	A
Approach Vol, veh/h	741		1985			1323
Approach Delay, s/veh	17.4		6.7			5.7
Approach LOS	B		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		30.8			30.8	15.7
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		31.5			31.5	19.5
Max Q Clear Time (g_c+I1), s		11.8			7.6	9.0
Green Ext Time (p_c), s		14.6			10.8	2.2

Intersection Summary	
HCM 6th Ctrl Delay	8.3
HCM 6th LOS	A

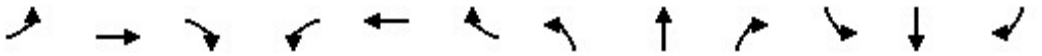
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			136			218			55
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



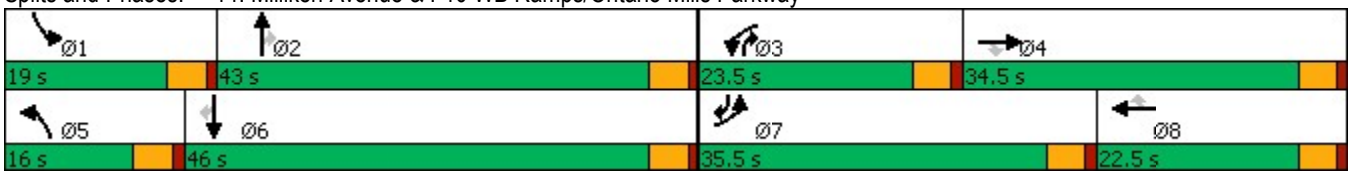
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	693	229	130	277	345	103	210	1366	420	305	1088	798
Future Volume (vph)	693	229	130	277	345	103	210	1366	420	305	1088	798
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	745	246	140	298	371	111	226	1469	452	328	1170	858
Shared Lane Traffic (%)												
Lane Group Flow (vph)	745	246	140	298	371	111	226	1469	452	328	1170	858

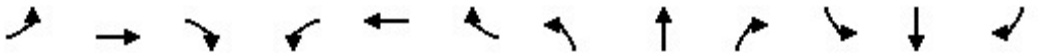
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	693	229	130	277	345	103	210	1366	420	305	1088	798
Future Volume (vph)	693	229	130	277	345	103	210	1366	420	305	1088	798
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	35.5	34.5	34.5	23.5	22.5	22.5	16.0	43.0	23.5	19.0	46.0	35.5
Total Split (%)	29.6%	28.8%	28.8%	19.6%	18.8%	18.8%	13.3%	35.8%	19.6%	15.8%	38.3%	29.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	31.0	31.0	31.0	16.7	16.6	16.6	11.3	37.1	58.3	14.5	40.3	75.9
Actuated g/C Ratio	0.26	0.26	0.26	0.14	0.14	0.14	0.10	0.32	0.50	0.12	0.34	0.65
v/c Ratio	0.98	0.53	0.30	0.73	0.78	0.34	0.81	0.77	0.53	0.92	0.56	0.87
Control Delay	70.5	42.8	15.3	59.1	61.2	7.2	75.1	39.4	11.9	82.4	32.6	27.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.5	42.8	15.3	59.1	61.2	7.2	75.1	39.4	11.9	82.4	32.6	27.2
LOS	E	D	B	E	E	A	E	D	B	F	C	C
Approach Delay		57.6			52.7			37.4			37.6	
Approach LOS		E			D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.3	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 42.9	Intersection LOS: D
Intersection Capacity Utilization 80.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway

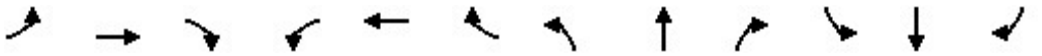




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	745	246	140	298	371	111	226	1469	452	328	1170	858
v/c Ratio	0.98	0.53	0.30	0.73	0.78	0.34	0.81	0.77	0.53	0.92	0.56	0.87
Control Delay	70.5	42.8	15.3	59.1	61.2	7.2	75.1	39.4	11.9	82.4	32.6	27.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.5	42.8	15.3	59.1	61.2	7.2	75.1	39.4	11.9	82.4	32.6	27.2
Queue Length 50th (ft)	297	166	27	113	146	0	90	295	109	131	212	477
Queue Length 95th (ft)	#430	253	82	161	201	34	#155	340	199	#222	249	#821
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	764	466	466	468	515	345	284	1995	880	357	2150	989
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.53	0.30	0.64	0.72	0.32	0.80	0.74	0.51	0.92	0.54	0.87

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	693	229	130	277	345	103	210	1366	420	305	1088	798
Future Volume (veh/h)	693	229	130	277	345	103	210	1366	420	305	1088	798
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	745	246	140	298	371	111	226	1469	452	328	1170	858
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	771	489	414	354	446	199	273	1979	670	361	2163	931
Arrive On Green	0.27	0.28	0.28	0.12	0.13	0.13	0.09	0.32	0.32	0.12	0.35	0.35
Sat Flow, veh/h	2910	1772	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	745	246	140	298	371	111	226	1469	452	328	1170	858
Grp Sat Flow(s),veh/h/ln	1455	1772	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	29.6	13.7	8.7	11.7	12.6	8.1	8.9	25.1	27.9	13.0	17.9	41.5
Cycle Q Clear(g_c), s	29.6	13.7	8.7	11.7	12.6	8.1	8.9	25.1	27.9	13.0	17.9	41.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	771	489	414	354	446	199	273	1979	670	361	2163	931
V/C Ratio(X)	0.97	0.50	0.34	0.84	0.83	0.56	0.83	0.74	0.67	0.91	0.54	0.92
Avail Cap(c_a), veh/h	771	489	414	473	518	231	286	2007	677	361	2163	931
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.4	35.6	33.8	50.3	49.5	47.5	52.1	35.1	25.7	50.6	30.1	19.7
Incr Delay (d2), s/veh	24.2	0.8	0.5	10.0	9.8	2.4	17.4	1.5	2.6	26.1	0.3	14.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.1	6.0	3.2	4.8	5.9	3.2	3.9	9.4	10.3	6.0	6.6	22.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.7	36.4	34.3	60.3	59.3	50.0	69.5	36.6	28.3	76.7	30.4	33.9
LnGrp LOS	E	D	C	E	E	D	E	D	C	E	C	C
Approach Vol, veh/h		1131			780			2147			2356	
Approach Delay, s/veh		56.1			58.4			38.3			38.1	
Approach LOS		E			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	42.5	18.7	36.8	15.5	46.0	35.5	20.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	38.5	19.0	30.0	11.5	41.5	31.0	18.0
Max Q Clear Time (g_c+I1), s	15.0	29.9	13.7	15.7	10.9	43.5	31.6	14.6
Green Ext Time (p_c), s	0.0	6.6	0.5	1.6	0.0	0.0	0.0	0.9

Intersection Summary	
HCM 6th Ctrl Delay	43.8
HCM 6th LOS	D

Notes

User approved changes to right turn type.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.993	0.850				
Flt Protected	0.955					
Satd. Flow (prot)	3066	1365	0	6071	6071	0
Flt Permitted	0.955					
Satd. Flow (perm)	3066	1365	0	6071	6071	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	9	9				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

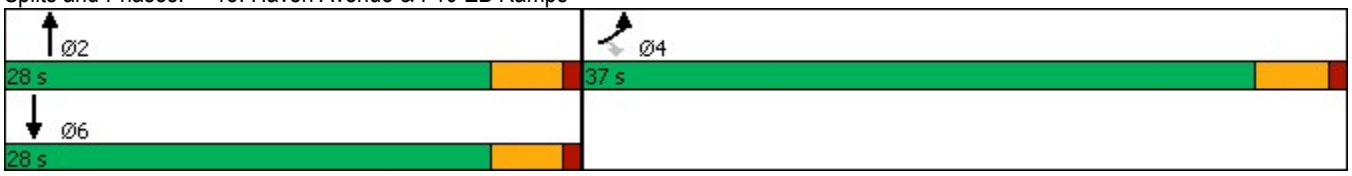
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	1037	537	0	1485	1217	0
Future Volume (vph)	1037	537	0	1485	1217	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1069	554	0	1531	1255	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	1124	499	0	1531	1255	0

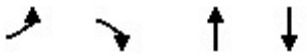
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1037	537	1485	1217
Future Volume (vph)	1037	537	1485	1217
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	37.0	37.0	28.0	28.0
Total Split (%)	56.9%	56.9%	43.1%	43.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	27.8	27.8	22.7	22.7
Actuated g/C Ratio	0.47	0.47	0.38	0.38
v/c Ratio	0.78	0.78	0.66	0.54
Control Delay	17.8	23.2	17.6	16.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	17.8	23.2	17.6	16.1
LOS	B	C	B	B
Approach Delay	19.5		17.6	16.1
Approach LOS	B		B	B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 59.6	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 17.9	Intersection LOS: B
Intersection Capacity Utilization 69.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1124	499	1531	1255
v/c Ratio	0.78	0.78	0.66	0.54
Control Delay	17.8	23.2	17.6	16.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	17.8	23.2	17.6	16.1
Queue Length 50th (ft)	166	156	139	107
Queue Length 95th (ft)	237	#290	184	145
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	1702	760	2431	2431
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.66	0.66	0.63	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1037	537	0	1485	1217	0
Future Volume (veh/h)	1037	537	0	1485	1217	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1772	0	1772	1772	0
Adj Flow Rate, veh/h	1081	541	0	1531	1255	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	1452	684	0	2301	2301	0
Arrive On Green	0.46	0.46	0.00	0.38	0.38	0.00
Sat Flow, veh/h	3188	1502	0	6592	6592	0
Grp Volume(v), veh/h	1081	541	0	1531	1255	0
Grp Sat Flow(s),veh/h/ln	1594	1502	0	1524	1524	0
Q Serve(g_s), s	15.1	16.5	0.0	11.2	8.7	0.0
Cycle Q Clear(g_c), s	15.1	16.5	0.0	11.2	8.7	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	1452	684	0	2301	2301	0
V/C Ratio(X)	0.74	0.79	0.00	0.67	0.55	0.00
Avail Cap(c_a), veh/h	1923	906	0	2659	2659	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.1	12.5	0.0	13.9	13.1	0.0
Incr Delay (d2), s/veh	1.1	3.5	0.0	0.5	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	5.1	0.0	3.4	2.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.2	16.0	0.0	14.5	13.3	0.0
LnGrp LOS	B	B	A	B	B	A
Approach Vol, veh/h	1622			1531	1255	
Approach Delay, s/veh	14.2			14.5	13.3	
Approach LOS	B			B	B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		24.8		29.0		24.8
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		23.5		32.5		23.5
Max Q Clear Time (g_c+I1), s		13.2		18.5		10.7
Green Ext Time (p_c), s		7.1		6.0		7.1

Intersection Summary	
HCM 6th Ctrl Delay	14.0
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1600	1800	1600	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2891	1500	2891	6071	6071	1500
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2891	1500	2891	6071	6071	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		11				127
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	887	222	158	1159	848	672
Future Volume (vph)	887	222	158	1159	848	672
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	914	229	163	1195	874	693
Shared Lane Traffic (%)						
Lane Group Flow (vph)	914	229	163	1195	874	693

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	887	222	158	1159	848	672
Future Volume (vph)	887	222	158	1159	848	672
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	39.0	12.0	12.0	36.0	24.0	39.0
Total Split (%)	52.0%	16.0%	16.0%	48.0%	32.0%	52.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	27.6	39.6	7.4	28.3	16.3	48.6
Actuated g/C Ratio	0.42	0.61	0.11	0.43	0.25	0.75
v/c Ratio	0.75	0.25	0.50	0.45	0.57	0.60
Control Delay	20.3	6.7	35.8	14.3	23.7	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	6.7	35.8	14.3	23.7	5.3
LOS	C	A	D	B	C	A
Approach Delay	17.6			16.9	15.6	
Approach LOS	B			B	B	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 65.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 59.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	914	229	163	1195	874	693
v/c Ratio	0.75	0.25	0.50	0.45	0.57	0.60
Control Delay	20.3	6.7	35.8	14.3	23.7	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	6.7	35.8	14.3	23.7	5.3
Queue Length 50th (ft)	155	36	34	98	92	68
Queue Length 95th (ft)	230	71	67	141	132	126
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	1571	923	341	3013	1865	1305
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.25	0.48	0.40	0.47	0.53

Intersection Summary

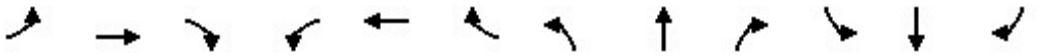
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	887	222	158	1159	848	672
Future Volume (veh/h)	887	222	158	1159	848	672
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1772	1575	1772	1772	1772
Adj Flow Rate, veh/h	914	229	163	1195	874	693
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1116	701	242	2862	1907	1045
Arrive On Green	0.38	0.38	0.08	0.47	0.31	0.31
Sat Flow, veh/h	2910	1502	2910	6343	6343	1502
Grp Volume(v), veh/h	914	229	163	1195	874	693
Grp Sat Flow(s),veh/h/ln	1455	1502	1455	1524	1524	1502
Q Serve(g_s), s	17.3	5.9	3.3	7.9	7.0	15.9
Cycle Q Clear(g_c), s	17.3	5.9	3.3	7.9	7.0	15.9
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1116	701	242	2862	1907	1045
V/C Ratio(X)	0.82	0.33	0.67	0.42	0.46	0.66
Avail Cap(c_a), veh/h	1641	971	357	3138	1942	1054
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.0	10.3	27.2	10.7	16.9	5.2
Incr Delay (d2), s/veh	2.2	0.3	3.2	0.1	0.2	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	6.0	1.2	2.3	2.3	10.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.1	10.5	30.5	10.8	17.0	6.8
LnGrp LOS	B	B	C	B	B	A
Approach Vol, veh/h	1143			1358	1567	
Approach Delay, s/veh	17.4			13.2	12.5	
Approach LOS	B			B	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		33.2		28.0	9.6	23.6
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		31.5		34.5	7.5	19.5
Max Q Clear Time (g_c+I1), s		9.9		19.3	5.3	17.9
Green Ext Time (p_c), s		9.1		4.2	0.1	1.2

Intersection Summary	
HCM 6th Ctrl Delay	14.1
HCM 6th LOS	B

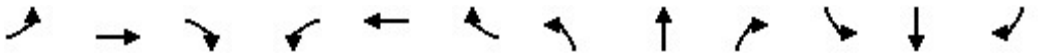
Appendix F

Intersection LOS Analysis Sheets
Opening Year With Related Projects Without Project Conditions



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.953				0.850			0.850		0.994	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4591	0	2891	3353	1500	2891	4818	1500	2891	6034	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4591	0	2891	3353	1500	2891	4818	1500	2891	6034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		90				149			238		8	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



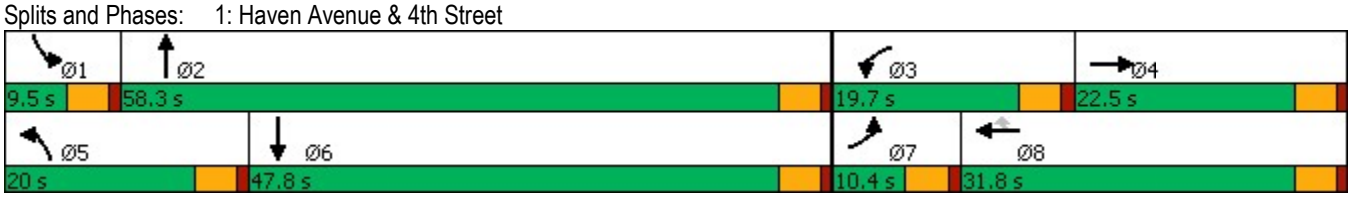
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	93	308	140	285	545	180	244	1666	508	104	1363	55
Future Volume (vph)	93	308	140	285	545	180	244	1666	508	104	1363	55
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	102	338	154	313	599	198	268	1831	558	114	1498	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	102	492	0	313	599	198	268	1831	558	114	1558	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	93	308	285	545	180	244	1666	508	104	1363
Future Volume (vph)	93	308	285	545	180	244	1666	508	104	1363
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	10.4	22.5	19.7	31.8	31.8	20.0	58.3		9.5	47.8
Total Split (%)	9.5%	20.5%	17.9%	28.9%	28.9%	18.2%	53.0%		8.6%	43.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	5.9	16.0	14.5	24.6	24.6	13.9	53.8	107.4	5.0	44.9
Actuated g/C Ratio	0.05	0.15	0.14	0.23	0.23	0.13	0.50	1.00	0.05	0.42
v/c Ratio	0.64	0.65	0.80	0.78	0.43	0.71	0.76	0.37	0.85	0.62
Control Delay	69.5	39.3	61.6	46.6	13.2	56.3	24.5	0.7	97.9	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.5	39.3	61.6	46.6	13.2	56.3	24.5	0.7	97.9	26.3
LOS	E	D	E	D	B	E	C	A	F	C
Approach Delay		44.5		44.9			22.7			31.2
Approach LOS		D		D			C			C

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 107.4	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 31.3	Intersection LOS: C
Intersection Capacity Utilization 73.2%	ICU Level of Service D
Analysis Period (min) 15	

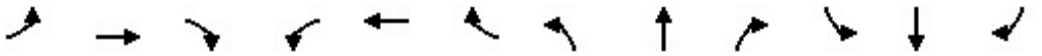
Splits and Phases: 1: Haven Avenue & 4th Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	102	492	313	599	198	268	1831	558	114	1558
v/c Ratio	0.64	0.65	0.80	0.78	0.43	0.71	0.76	0.37	0.85	0.62
Control Delay	69.5	39.3	61.6	46.6	13.2	56.3	24.5	0.7	97.9	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.5	39.3	61.6	46.6	13.2	56.3	24.5	0.7	97.9	26.3
Queue Length 50th (ft)	37	97	111	204	27	93	375	0	41	253
Queue Length 95th (ft)	#75	135	#175	268	90	138	440	0	#96	297
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	159	844	409	853	492	417	2415	1500	134	2527
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	0.77	0.70	0.40	0.64	0.76	0.37	0.85	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



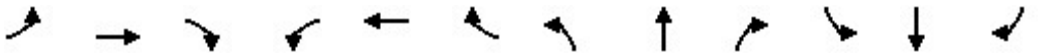
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	308	140	285	545	180	244	1666	508	104	1363	55
Future Volume (veh/h)	93	308	140	285	545	180	244	1666	508	104	1363	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	102	338	154	313	599	198	268	1831	0	114	1498	60
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	148	465	199	369	727	324	327	2485		139	2720	109
Arrive On Green	0.05	0.14	0.14	0.13	0.22	0.22	0.11	0.51	0.00	0.05	0.45	0.45
Sat Flow, veh/h	2910	3321	1420	2910	3367	1502	2910	4837	1502	2910	6057	242
Grp Volume(v), veh/h	102	328	164	313	599	198	268	1831	0	114	1130	428
Grp Sat Flow(s),veh/h/ln	1455	1612	1516	1455	1683	1502	1455	1612	1502	1455	1524	1728
Q Serve(g_s), s	3.6	10.2	11.0	11.0	17.8	12.5	9.4	31.0	0.0	4.1	19.0	19.0
Cycle Q Clear(g_c), s	3.6	10.2	11.0	11.0	17.8	12.5	9.4	31.0	0.0	4.1	19.0	19.0
Prop In Lane	1.00		0.94	1.00		1.00	1.00		1.00	1.00		0.14
Lane Grp Cap(c), veh/h	148	452	212	369	727	324	327	2485		139	2052	776
V/C Ratio(X)	0.69	0.73	0.77	0.85	0.82	0.61	0.82	0.74		0.82	0.55	0.55
Avail Cap(c_a), veh/h	164	554	261	422	877	391	431	2485		139	2052	776
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.9	43.1	43.4	44.7	39.2	37.1	45.4	19.9	0.0	49.4	21.1	21.1
Incr Delay (d2), s/veh	10.2	3.7	11.1	13.6	5.5	1.9	9.1	2.0	0.0	30.8	1.1	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	4.3	4.7	4.6	7.8	4.7	3.8	11.5	0.0	2.1	6.8	8.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.1	46.8	54.5	58.3	44.6	39.0	54.6	21.9	0.0	80.3	22.2	23.9
LnGrp LOS	E	D	D	E	D	D	D	C		F	C	C
Approach Vol, veh/h		594			1110			2099	A		1672	
Approach Delay, s/veh		51.0			47.5			26.1			26.6	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	58.3	17.8	19.2	16.3	51.5	9.8	27.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	53.8	15.2	18.0	15.5	43.3	5.9	27.3
Max Q Clear Time (g_c+I1), s	6.1	33.0	13.0	13.0	11.4	21.0	5.6	19.8
Green Ext Time (p_c), s	0.0	14.0	0.3	1.4	0.3	11.8	0.0	2.8

Intersection Summary	
HCM 6th Ctrl Delay	33.3
HCM 6th LOS	C

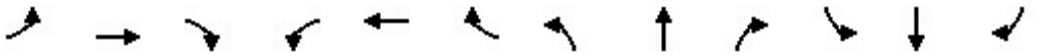
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.994				0.850			0.850		0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	6034	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	6034	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				164			164		428	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	38	544	21	1	795	109	3	1	1	176	0	3
Future Volume (vph)	38	544	21	1	795	109	3	1	1	176	0	3
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	42	604	23	1	883	121	3	1	1	196	0	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	627	0	1	883	121	3	1	1	196	3	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	38	544	1	795	109	3	1	1	176	0
Future Volume (vph)	38	544	1	795	109	3	1	1	176	0
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			2		
Detector Phase	7	4	3	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5
Total Split (s)	9.5	22.5	9.5	22.5	22.5	11.3	23.0	23.0	15.0	26.7
Total Split (%)	13.6%	32.1%	13.6%	32.1%	32.1%	16.1%	32.9%	32.9%	21.4%	38.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	5.1	17.5	5.1	15.9	15.9	5.8	5.7	5.7	10.3	18.8
Actuated g/C Ratio	0.10	0.36	0.10	0.33	0.33	0.12	0.12	0.12	0.21	0.38
v/c Ratio	0.25	0.29	0.01	0.56	0.20	0.02	0.00	0.00	0.59	0.00
Control Delay	27.5	11.7	24.0	15.9	2.5	23.0	23.0	0.0	29.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	11.7	24.0	15.9	2.5	23.0	23.0	0.0	29.5	0.0
LOS	C	B	C	B	A	C	C	A	C	A
Approach Delay		12.7		14.3			18.4			29.0
Approach LOS		B		B			B			C

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 48.9	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization 49.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	42	627	1	883	121	3	1	1	196	3
v/c Ratio	0.25	0.29	0.01	0.56	0.20	0.02	0.00	0.00	0.59	0.00
Control Delay	27.5	11.7	24.0	15.9	2.5	23.0	23.0	0.0	29.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	11.7	24.0	15.9	2.5	23.0	23.0	0.0	29.5	0.0
Queue Length 50th (ft)	11	32	0	64	0	1	0	0	48	0
Queue Length 95th (ft)	40	66	4	127	18	7	4	0	#145	0
Internal Link Dist (ft)		2546		362			269			358
Turn Bay Length (ft)	130		130		145	165		165	50	
Base Capacity (vph)	165	2480	165	1815	667	225	683	681	347	1553
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.25	0.01	0.49	0.18	0.01	0.00	0.00	0.56	0.00

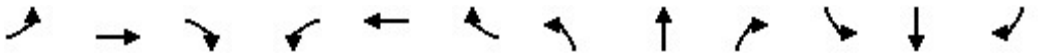
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	544	21	1	795	109	3	1	1	176	0	3
Future Volume (veh/h)	38	544	21	1	795	109	3	1	1	176	0	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	42	604	23	1	883	121	3	1	1	196	0	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	72	2057	78	4	1426	443	7	196	166	243	435	388
Arrive On Green	0.05	0.34	0.34	0.00	0.29	0.29	0.00	0.11	0.11	0.15	0.00	0.26
Sat Flow, veh/h	1594	6073	229	1594	4837	1502	1594	1772	1502	1594	1683	1502
Grp Volume(v), veh/h	42	453	174	1	883	121	3	1	1	196	0	3
Grp Sat Flow(s),veh/h/ln	1594	1524	1731	1594	1612	1502	1594	1772	1502	1594	1683	1502
Q Serve(g_s), s	1.2	3.3	3.3	0.0	7.1	2.8	0.1	0.0	0.0	5.4	0.0	0.1
Cycle Q Clear(g_c), s	1.2	3.3	3.3	0.0	7.1	2.8	0.1	0.0	0.0	5.4	0.0	0.1
Prop In Lane	1.00		0.13	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	72	1548	586	4	1426	443	7	196	166	243	435	388
V/C Ratio(X)	0.58	0.29	0.30	0.28	0.62	0.27	0.46	0.01	0.01	0.81	0.00	0.01
Avail Cap(c_a), veh/h	176	1816	688	176	1922	597	239	723	613	369	825	736
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.2	11.0	11.0	22.6	13.8	12.3	22.5	17.9	17.9	18.6	0.0	12.5
Incr Delay (d2), s/veh	7.2	0.1	0.3	39.2	0.4	0.3	43.2	0.0	0.0	7.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.9	1.1	0.0	2.2	0.8	0.1	0.0	0.0	2.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.4	11.1	11.3	61.7	14.2	12.6	65.7	18.0	18.0	26.1	0.0	12.5
LnGrp LOS	C	B	B	E	B	B	E	B	B	C	A	B
Approach Vol, veh/h		669			1005			5			199	
Approach Delay, s/veh		12.2			14.1			46.6			25.9	
Approach LOS		B			B			D			C	

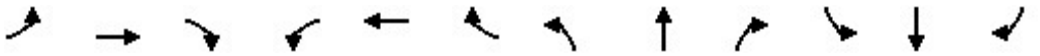
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.4	9.5	4.6	19.8	4.7	16.2	6.6	17.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	18.5	5.0	18.0	6.8	22.2	5.0	18.0
Max Q Clear Time (g_c+I1), s	7.4	2.0	2.0	5.3	2.1	2.1	3.2	9.1
Green Ext Time (p_c), s	0.2	0.0	0.0	3.3	0.0	0.0	0.0	4.2

Intersection Summary	
HCM 6th Ctrl Delay	14.8
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.997				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.956	
Satd. Flow (prot)	2891	6065	0	1583	4803	0	1583	1765	1500	0	1687	1500
Flt Permitted	0.950			0.950			0.731				0.740	
Satd. Flow (perm)	2891	6065	0	1583	4803	0	1218	1765	1500	0	1306	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			6				109			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



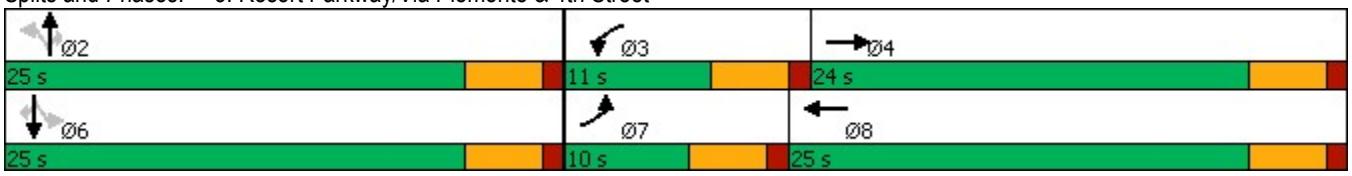
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	15	716	4	16	867	20	8	3	11	34	3	17
Future Volume (vph)	15	716	4	16	867	20	8	3	11	34	3	17
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	16	770	4	17	932	22	9	3	12	37	3	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	774	0	17	954	0	9	3	12	0	40	18

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	15	716	16	867	8	3	11	34	3	17
Future Volume (vph)	15	716	16	867	8	3	11	34	3	17
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8		2			6	
Permitted Phases					2		2	6		6
Detector Phase	7	4	3	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	10.0	24.0	11.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (%)	16.7%	40.0%	18.3%	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	5.8	14.4	6.1	14.5	6.8	6.8	6.8		6.8	6.8
Actuated g/C Ratio	0.18	0.45	0.19	0.45	0.21	0.21	0.21		0.21	0.21
v/c Ratio	0.03	0.28	0.06	0.44	0.04	0.01	0.03		0.15	0.04
Control Delay	15.4	6.5	15.2	7.2	13.9	13.7	0.2		14.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	15.4	6.5	15.2	7.2	13.9	13.7	0.2		14.7	0.2
LOS	B	A	B	A	B	B	A		B	A
Approach Delay		6.7		7.3		7.0			10.2	
Approach LOS		A		A		A			B	

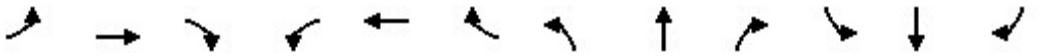
Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 32.1	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 7.1	Intersection LOS: A
Intersection Capacity Utilization 37.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	16	774	17	954	9	3	12	40	18
v/c Ratio	0.03	0.28	0.06	0.44	0.04	0.01	0.03	0.15	0.04
Control Delay	15.4	6.5	15.2	7.2	13.9	13.7	0.2	14.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.4	6.5	15.2	7.2	13.9	13.7	0.2	14.7	0.2
Queue Length 50th (ft)	1	16	2	28	1	0	0	5	0
Queue Length 95th (ft)	8	58	18	93	11	6	0	30	0
Internal Link Dist (ft)		362		428		302		378	
Turn Bay Length (ft)	220		125		115		115		110
Base Capacity (vph)	522	3890	338	3240	821	1190	1046	880	1046
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.20	0.05	0.29	0.01	0.00	0.01	0.05	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	716	4	16	867	20	8	3	11	34	3	17
Future Volume (veh/h)	15	716	4	16	867	20	8	3	11	34	3	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	16	770	4	17	932	22	9	3	12	37	3	18
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	60	2413	13	35	1866	44	413	285	242	428	26	242
Arrive On Green	0.02	0.38	0.38	0.02	0.38	0.38	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	2910	6305	33	1594	4862	115	1314	1772	1502	1272	161	1502
Grp Volume(v), veh/h	16	558	216	17	618	336	9	3	12	40	0	18
Grp Sat Flow(s),veh/h/ln	1455	1524	1766	1594	1612	1751	1314	1772	1502	1432	0	1502
Q Serve(g_s), s	0.2	2.7	2.7	0.3	4.5	4.5	0.2	0.0	0.2	0.6	0.0	0.3
Cycle Q Clear(g_c), s	0.2	2.7	2.7	0.3	4.5	4.5	0.9	0.0	0.2	0.7	0.0	0.3
Prop In Lane	1.00		0.02	1.00		0.07	1.00		1.00	0.92		1.00
Lane Grp Cap(c), veh/h	60	1750	676	35	1238	672	413	285	242	453	0	242
V/C Ratio(X)	0.26	0.32	0.32	0.49	0.50	0.50	0.02	0.01	0.05	0.09	0.00	0.07
Avail Cap(c_a), veh/h	515	2869	1108	333	2127	1155	1068	1169	991	1162	0	991
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.0	6.7	6.7	15.0	7.3	7.3	11.6	11.0	11.0	11.2	0.0	11.1
Incr Delay (d2), s/veh	2.3	0.1	0.3	10.1	0.3	0.6	0.0	0.0	0.1	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.5	0.7	0.2	1.0	1.1	0.0	0.0	0.1	0.2	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.3	6.8	7.0	25.1	7.6	7.9	11.6	11.0	11.1	11.3	0.0	11.2
LnGrp LOS	B	A	A	C	A	A	B	B	B	B	A	B
Approach Vol, veh/h		790			971			24			58	
Approach Delay, s/veh		7.1			8.0			11.3			11.3	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	5.2	16.4		9.5	5.1	16.4				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		20.5	6.5	19.5		20.5	5.5	20.5				
Max Q Clear Time (g_c+I1), s		2.9	2.3	4.7		2.7	2.2	6.5				
Green Ext Time (p_c), s		0.0	0.0	4.5		0.2	0.0	5.4				

Intersection Summary	
HCM 6th Ctrl Delay	7.8
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.996					0.865
Flt Protected						
Satd. Flow (prot)	4798	0	0	4818	0	1526
Flt Permitted						
Satd. Flow (perm)	4798	0	0	4818	0	1526
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	754	21	0	860	0	3
Future Volume (vph)	754	21	0	860	0	3
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	820	23	0	935	0	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	843	0	0	935	0	3

Intersection Summary

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	754	21	0	860	0	3
Future Vol, veh/h	754	21	0	860	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	820	23	0	935	0	3

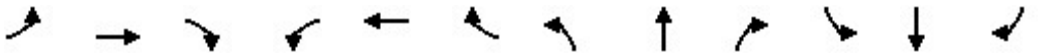
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	422
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	496
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	496
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	496	-	-	-
HCM Lane V/C Ratio	0.007	-	-	-
HCM Control Delay (s)	12.3	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.986	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5986	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5986	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			240			285			73		24	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



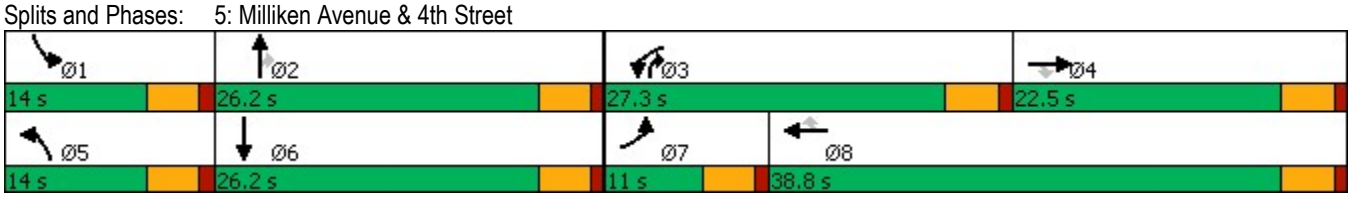
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	154	515	226	466	1298	407	236	993	154	248	951	97
Future Volume (vph)	154	515	226	466	1298	407	236	993	154	248	951	97
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	166	554	243	501	1396	438	254	1068	166	267	1023	104
Shared Lane Traffic (%)												
Lane Group Flow (vph)	166	554	243	501	1396	438	254	1068	166	267	1127	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	154	515	226	466	1298	407	236	993	154	248	951
Future Volume (vph)	154	515	226	466	1298	407	236	993	154	248	951
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	11.0	22.5	22.5	27.3	38.8	38.8	14.0	26.2	27.3	14.0	26.2
Total Split (%)	12.2%	25.0%	25.0%	30.3%	43.1%	43.1%	15.6%	29.1%	30.3%	15.6%	29.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	6.5	20.3	20.3	19.8	33.6	33.6	9.5	21.3	45.5	9.5	21.3
Actuated g/C Ratio	0.07	0.23	0.23	0.22	0.38	0.38	0.11	0.24	0.51	0.11	0.24
v/c Ratio	0.79	0.50	0.46	0.78	0.77	0.59	0.82	0.74	0.21	0.86	0.78
Control Delay	67.5	32.5	7.7	41.5	27.6	11.1	61.8	34.9	6.8	67.0	35.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.5	32.5	7.7	41.5	27.6	11.1	61.8	34.9	6.8	67.0	35.4
LOS	E	C	A	D	C	B	E	C	A	E	D
Approach Delay		32.3			27.5			36.3			41.4
Approach LOS		C			C			D			D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 88.9	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 33.5	Intersection LOS: C
Intersection Capacity Utilization 70.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Milliken Avenue & 4th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	166	554	243	501	1396	438	254	1068	166	267	1127
v/c Ratio	0.79	0.50	0.46	0.78	0.77	0.59	0.82	0.74	0.21	0.86	0.78
Control Delay	67.5	32.5	7.7	41.5	27.6	11.1	61.8	34.9	6.8	67.0	35.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.5	32.5	7.7	41.5	27.6	11.1	61.8	34.9	6.8	67.0	35.4
Queue Length 50th (ft)	48	101	1	137	248	59	74	162	26	78	170
Queue Length 95th (ft)	#102	142	63	187	304	154	#138	201	55	#147	210
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	211	1102	528	742	1860	754	309	1482	852	309	1480
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.50	0.46	0.68	0.75	0.58	0.82	0.72	0.19	0.86	0.76

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

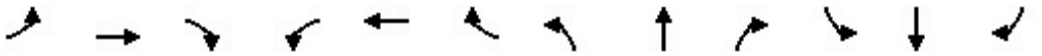
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	154	515	226	466	1298	407	236	993	154	248	951	97
Future Volume (veh/h)	154	515	226	466	1298	407	236	993	154	248	951	97
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	166	554	243	501	1396	438	254	1068	166	267	1023	104
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	223	1182	367	589	1791	556	317	1400	649	325	1319	133
Arrive On Green	0.08	0.24	0.24	0.20	0.37	0.37	0.11	0.23	0.23	0.11	0.23	0.23
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	2910	6095	1502	2910	5669	572
Grp Volume(v), veh/h	166	554	243	501	1396	438	254	1068	166	267	823	304
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1455	1524	1502	1455	1524	1669
Q Serve(g_s), s	4.7	8.3	12.4	14.1	21.7	22.0	7.2	13.9	6.0	7.6	14.3	14.5
Cycle Q Clear(g_c), s	4.7	8.3	12.4	14.1	21.7	22.0	7.2	13.9	6.0	7.6	14.3	14.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	223	1182	367	589	1791	556	317	1400	649	325	1064	388
V/C Ratio(X)	0.75	0.47	0.66	0.85	0.78	0.79	0.80	0.76	0.26	0.82	0.77	0.78
Avail Cap(c_a), veh/h	223	1182	367	781	1952	606	325	1556	687	325	1167	426
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.4	27.4	29.0	32.6	23.7	23.8	37.0	30.6	15.4	36.9	30.5	30.6
Incr Delay (d2), s/veh	12.8	0.3	4.4	6.9	1.9	6.4	13.2	2.1	0.2	15.3	3.0	8.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	3.2	4.8	5.4	8.2	8.4	3.1	5.2	2.0	3.3	5.4	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.3	27.7	33.4	39.6	25.6	30.2	50.2	32.6	15.6	52.2	33.5	39.0
LnGrp LOS	D	C	C	D	C	C	D	C	B	D	C	D
Approach Vol, veh/h		963			2335			1488			1394	
Approach Delay, s/veh		33.2			29.5			33.7			38.3	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	24.0	21.7	25.3	13.7	24.3	11.0	36.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	21.7	22.8	18.0	9.5	21.7	6.5	34.3
Max Q Clear Time (g_c+I1), s	9.6	15.9	16.1	14.4	9.2	16.5	6.7	24.0
Green Ext Time (p_c), s	0.0	3.6	1.1	1.6	0.0	3.1	0.0	7.4

Intersection Summary	
HCM 6th Ctrl Delay	33.1
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.899	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2887	1365
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2887	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136			136			136		214	214
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



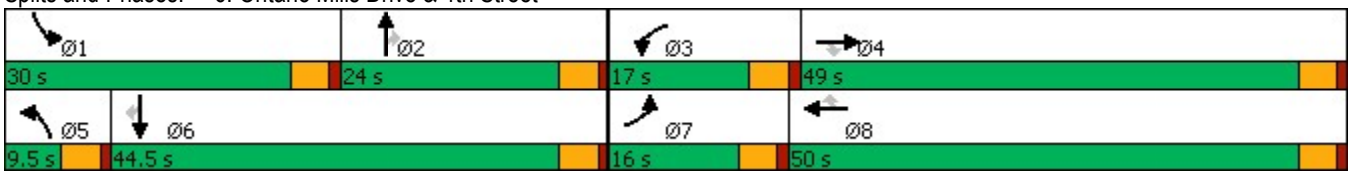
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	336	469	59	124	1371	172	72	71	86	194	223	927
Future Volume (vph)	336	469	59	124	1371	172	72	71	86	194	223	927
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	386	539	68	143	1576	198	83	82	99	223	256	1066
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	386	539	68	143	1576	198	83	82	99	223	789	533

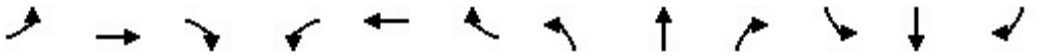
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	336	469	59	124	1371	172	72	71	86	194	223	927
Future Volume (vph)	336	469	59	124	1371	172	72	71	86	194	223	927
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	16.0	49.0	49.0	17.0	50.0	50.0	9.5	24.0	24.0	30.0	44.5	44.5
Total Split (%)	13.3%	40.8%	40.8%	14.2%	41.7%	41.7%	7.9%	20.0%	20.0%	25.0%	37.1%	37.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	11.6	45.2	45.2	10.7	44.3	44.3	5.0	21.4	21.4	20.7	37.0	37.0
Actuated g/C Ratio	0.10	0.39	0.39	0.09	0.38	0.38	0.04	0.18	0.18	0.18	0.32	0.32
v/c Ratio	1.34	0.29	0.10	0.54	0.86	0.30	1.22	0.13	0.26	0.79	0.89dr	0.92
Control Delay	215.4	25.7	0.3	59.0	39.1	10.1	228.8	42.2	4.5	65.8	29.8	44.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	215.4	25.7	0.3	59.0	39.1	10.1	228.8	42.2	4.5	65.8	29.8	44.9
LOS	F	C	A	E	D	B	F	D	A	E	C	D
Approach Delay		97.7			37.6			86.7			40.2	
Approach LOS		F			D			F			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 116	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.34	
Intersection Signal Delay: 53.8	Intersection LOS: D
Intersection Capacity Utilization 84.1%	ICU Level of Service E
Analysis Period (min) 15	
dr Defacto Right Lane. Recode with 1 though lane as a right lane.	

Splits and Phases: 6: Ontario Mills Drive & 4th Street





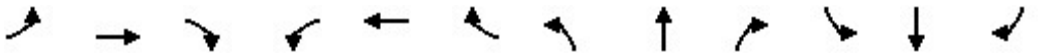
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	386	539	68	143	1576	198	83	82	99	223	789	533
v/c Ratio	1.34	0.29	0.10	0.54	0.86	0.30	1.22	0.13	0.26	0.79	0.89dr	0.92
Control Delay	215.4	25.7	0.3	59.0	39.1	10.1	228.8	42.2	4.5	65.8	29.8	44.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	215.4	25.7	0.3	59.0	39.1	10.1	228.8	42.2	4.5	65.8	29.8	44.9
Queue Length 50th (ft)	~205	105	0	55	408	31	~81	27	0	166	217	279
Queue Length 95th (ft)	#292	132	0	85	450	79	#179	51	19	238	278	#483
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	288	1889	670	313	1900	674	68	625	390	350	1141	612
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.34	0.29	0.10	0.46	0.83	0.29	1.22	0.13	0.25	0.64	0.69	0.87

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



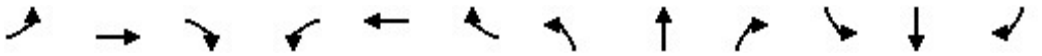
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	336	469	59	124	1371	172	72	71	86	194	223	927
Future Volume (veh/h)	336	469	59	124	1371	172	72	71	86	194	223	927
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	386	539	68	143	1576	198	83	82	99	223	256	1066
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	283	1942	603	192	1791	556	67	752	335	250	599	1015
Arrive On Green	0.10	0.40	0.40	0.07	0.37	0.37	0.04	0.22	0.22	0.16	0.34	0.34
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	1594	3367	1502	1594	1772	3003
Grp Volume(v), veh/h	386	539	68	143	1576	198	83	82	99	223	256	1066
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1594	1683	1502	1594	1772	1502
Q Serve(g_s), s	11.5	8.9	3.4	5.7	36.0	11.3	5.0	2.3	6.5	16.2	13.2	40.0
Cycle Q Clear(g_c), s	11.5	8.9	3.4	5.7	36.0	11.3	5.0	2.3	6.5	16.2	13.2	40.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	283	1942	603	192	1791	556	67	752	335	250	599	1015
V/C Ratio(X)	1.36	0.28	0.11	0.75	0.88	0.36	1.23	0.11	0.30	0.89	0.43	1.05
Avail Cap(c_a), veh/h	283	1942	603	307	1860	577	67	752	335	344	599	1015
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.4	23.8	22.2	54.3	34.8	27.0	56.7	36.6	38.2	48.9	30.3	39.2
Incr Delay (d2), s/veh	185.2	0.1	0.1	5.6	5.1	0.4	184.7	0.1	0.5	19.1	0.5	42.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.5	3.4	1.2	2.2	14.7	4.1	5.5	1.0	2.4	7.8	5.7	20.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	238.6	23.9	22.3	59.9	39.9	27.4	241.4	36.6	38.7	68.0	30.8	81.4
LnGrp LOS	F	C	C	E	D	C	F	D	D	E	C	F
Approach Vol, veh/h		993			1917			264			1545	
Approach Delay, s/veh		107.3			40.1			101.8			71.1	
Approach LOS		F			D			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.1	30.9	12.3	52.0	9.5	44.5	16.0	48.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	25.5	19.5	12.5	44.5	5.0	40.0	11.5	45.5
Max Q Clear Time (g_c+I1), s	18.2	8.5	7.7	10.9	7.0	42.0	13.5	38.0
Green Ext Time (p_c), s	0.4	0.5	0.2	4.3	0.0	0.0	0.0	5.8

Intersection Summary	
HCM 6th Ctrl Delay	67.8
HCM 6th LOS	E

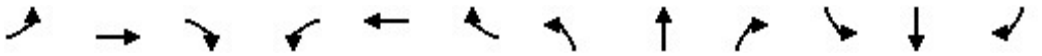
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.982			0.898				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.964	
Satd. Flow (prot)	2891	4818	1500	1583	4731	0	1583	3011	0	1504	1616	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.964	
Satd. Flow (perm)	2891	4818	1500	1583	4731	0	1583	3011	0	1504	1616	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127		25			60				407
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



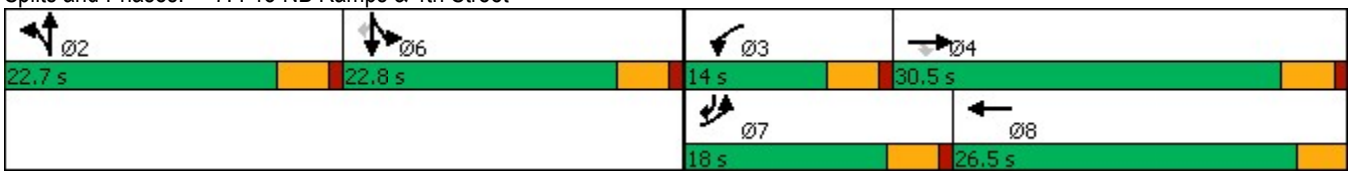
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	273	403	107	45	557	74	132	27	57	489	74	976
Future Volume (vph)	273	403	107	45	557	74	132	27	57	489	74	976
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	287	424	113	47	586	78	139	28	60	515	78	1027
Shared Lane Traffic (%)										43%		
Lane Group Flow (vph)	287	424	113	47	664	0	139	88	0	294	299	1027

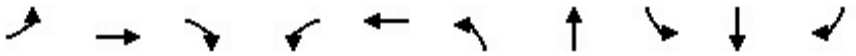
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	273	403	107	45	557	132	27	489	74	976
Future Volume (vph)	273	403	107	45	557	132	27	489	74	976
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	18.0	30.5	30.5	14.0	26.5	22.7	22.7	22.8	22.8	18.0
Total Split (%)	20.0%	33.9%	33.9%	15.6%	29.4%	25.2%	25.2%	25.3%	25.3%	20.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	12.6	25.8	25.8	7.6	16.9	12.2	12.2	18.4	18.4	35.6
Actuated g/C Ratio	0.16	0.33	0.33	0.10	0.22	0.16	0.16	0.24	0.24	0.46
v/c Ratio	0.61	0.26	0.19	0.30	0.63	0.56	0.17	0.82	0.78	0.72
Control Delay	37.8	21.4	4.8	40.5	29.6	40.4	13.9	51.4	46.1	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	21.4	4.8	40.5	29.6	40.4	13.9	51.4	46.1	14.1
LOS	D	C	A	D	C	D	B	D	D	B
Approach Delay		24.9			30.3		30.1		26.8	
Approach LOS		C			C		C		C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 77.4	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 27.3	Intersection LOS: C
Intersection Capacity Utilization 68.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street

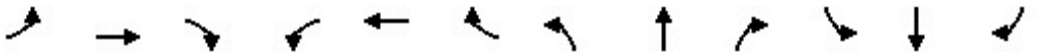




Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	287	424	113	47	664	139	88	294	299	1027
v/c Ratio	0.61	0.26	0.19	0.30	0.63	0.56	0.17	0.82	0.78	0.72
Control Delay	37.8	21.4	4.8	40.5	29.6	40.4	13.9	51.4	46.1	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	21.4	4.8	40.5	29.6	40.4	13.9	51.4	46.1	14.1
Queue Length 50th (ft)	67	59	0	22	103	64	6	145	145	129
Queue Length 95th (ft)	123	96	32	59	153	127	26	#342	#335	268
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	512	1712	615	197	1445	378	764	361	388	1465
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.25	0.18	0.24	0.46	0.37	0.12	0.81	0.77	0.70

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



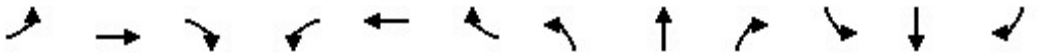
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	273	403	107	45	557	74	132	27	57	489	74	976
Future Volume (veh/h)	273	403	107	45	557	74	132	27	57	489	74	976
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	287	424	113	47	586	78	139	28	60	571	0	1027
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	381	1427	443	69	898	118	196	207	184	866	0	1209
Arrive On Green	0.13	0.29	0.29	0.04	0.21	0.21	0.12	0.12	0.12	0.27	0.00	0.27
Sat Flow, veh/h	2910	4837	1502	1594	4326	568	1594	1683	1502	3188	0	3003
Grp Volume(v), veh/h	287	424	113	47	435	229	139	28	60	571	0	1027
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1594	1612	1670	1594	1683	1502	1594	0	1502
Q Serve(g_s), s	6.4	4.6	3.9	2.0	8.3	8.5	5.6	1.0	2.5	10.7	0.0	18.3
Cycle Q Clear(g_c), s	6.4	4.6	3.9	2.0	8.3	8.5	5.6	1.0	2.5	10.7	0.0	18.3
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	381	1427	443	69	669	346	196	207	184	866	0	1209
V/C Ratio(X)	0.75	0.30	0.26	0.68	0.65	0.66	0.71	0.14	0.33	0.66	0.00	0.85
Avail Cap(c_a), veh/h	583	1867	580	225	1101	570	431	455	406	866	0	1209
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.2	18.3	18.1	31.8	24.5	24.5	28.4	26.4	27.0	21.8	0.0	18.3
Incr Delay (d2), s/veh	3.0	0.1	0.3	11.0	1.1	2.2	4.7	0.3	1.0	1.9	0.0	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	1.6	1.3	0.9	3.1	3.4	2.3	0.4	0.9	4.0	0.0	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.3	18.5	18.4	42.8	25.5	26.7	33.1	26.7	28.0	23.6	0.0	24.2
LnGrp LOS	C	B	B	D	C	C	C	C	C	C	A	C
Approach Vol, veh/h		824			711			227			1598	
Approach Delay, s/veh		22.9			27.0			31.0			24.0	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		12.8	7.4	24.4		22.8	13.3	18.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		18.2	9.5	26.0		18.3	13.5	* 23				
Max Q Clear Time (g_c+I1), s		7.6	4.0	6.6		20.3	8.4	10.5				
Green Ext Time (p_c), s		0.6	0.0	3.1		0.0	0.5	3.5				

Intersection Summary	
HCM 6th Ctrl Delay	24.8
HCM 6th LOS	C

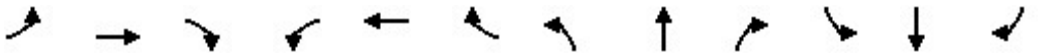
Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
User approved changes to right turn type.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.904				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3031	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3031	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		90				182			182			182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



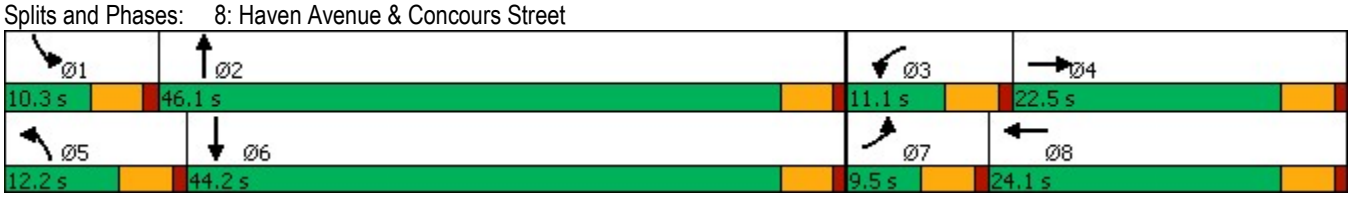
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	21	45	81	180	59	18	71	1967	154	139	1540	44
Future Volume (vph)	21	45	81	180	59	18	71	1967	154	139	1540	44
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	23	50	90	200	66	20	79	2186	171	154	1711	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	140	0	200	66	20	79	2186	171	154	1711	49

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	21	45	180	59	18	71	1967	154	139	1540	44
Future Volume (vph)	21	45	180	59	18	71	1967	154	139	1540	44
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	11.1	24.1		12.2	46.1		10.3	44.2	
Total Split (%)	10.6%	25.0%	12.3%	26.8%		13.6%	51.2%		11.4%	49.1%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.0	7.0	6.6	14.4	79.0	7.0	41.6	79.0	5.8	42.4	79.0
Actuated g/C Ratio	0.06	0.09	0.08	0.18	1.00	0.09	0.53	1.00	0.07	0.54	1.00
v/c Ratio	0.13	0.40	0.61	0.11	0.01	0.31	0.68	0.11	0.73	0.52	0.03
Control Delay	37.2	17.9	43.8	29.8	0.0	37.2	15.4	0.2	57.4	13.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.2	17.9	43.8	29.8	0.0	37.2	15.4	0.2	57.4	13.3	0.0
LOS	D	B	D	C	A	D	B	A	E	B	A
Approach Delay		20.6		37.5			15.0			16.5	
Approach LOS		C		D			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 79	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 17.2	Intersection LOS: B
Intersection Capacity Utilization 58.3%	ICU Level of Service B
Analysis Period (min) 15	

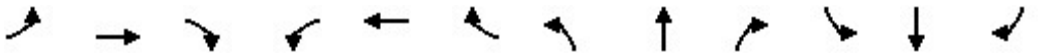
Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	23	140	200	66	20	79	2186	171	154	1711	49
v/c Ratio	0.13	0.40	0.61	0.11	0.01	0.31	0.68	0.11	0.73	0.52	0.03
Control Delay	37.2	17.9	43.8	29.8	0.0	37.2	15.4	0.2	57.4	13.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.2	17.9	43.8	29.8	0.0	37.2	15.4	0.2	57.4	13.3	0.0
Queue Length 50th (ft)	5	12	34	13	0	19	214	0	39	158	0
Queue Length 95th (ft)	17	38	#58	34	0	40	275	0	#87	206	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	183	760	329	832	1500	281	3197	1500	212	3261	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.18	0.61	0.08	0.01	0.28	0.68	0.11	0.73	0.52	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



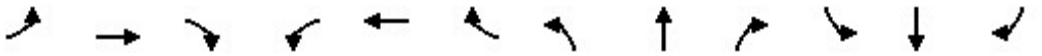
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	45	81	180	59	18	71	1967	154	139	1540	44
Future Volume (veh/h)	21	45	81	180	59	18	71	1967	154	139	1540	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	23	50	90	200	66	0	79	2186	0	154	1711	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	74	154	137	301	477		159	3123		220	3251	
Arrive On Green	0.03	0.09	0.09	0.08	0.14	0.00	0.05	0.51	0.00	0.08	0.53	0.00
Sat Flow, veh/h	2910	1683	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	23	50	90	200	66	0	79	2186	0	154	1711	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	0.6	2.0	4.3	3.6	1.3	0.0	1.9	20.0	0.0	3.8	13.4	0.0
Cycle Q Clear(g_c), s	0.6	2.0	4.3	3.6	1.3	0.0	1.9	20.0	0.0	3.8	13.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	74	154	137	301	477		159	3123		220	3251	
V/C Ratio(X)	0.31	0.33	0.66	0.66	0.14		0.50	0.70		0.70	0.53	
Avail Cap(c_a), veh/h	198	412	368	356	898		305	3451		230	3293	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.2	31.3	32.3	33.0	27.6	0.0	33.8	13.6	0.0	33.2	11.1	0.0
Incr Delay (d2), s/veh	2.3	1.2	5.2	3.6	0.1	0.0	2.4	0.6	0.0	8.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.9	1.7	1.2	0.5	0.0	0.7	6.2	0.0	1.6	4.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.5	32.5	37.5	36.6	27.7	0.0	36.2	14.2	0.0	41.9	11.3	0.0
LnGrp LOS	D	C	D	D	C		D	B		D	B	
Approach Vol, veh/h		163			266	A		2265	A		1865	A
Approach Delay, s/veh		36.0			34.4			15.0			13.8	
Approach LOS		D			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	42.1	10.1	11.2	8.5	43.7	6.4	14.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.8	41.6	6.6	18.0	7.7	39.7	5.0	19.6
Max Q Clear Time (g_c+I1), s	5.8	22.0	5.6	6.3	3.9	15.4	2.6	3.3
Green Ext Time (p_c), s	0.0	15.6	0.1	0.5	0.1	14.6	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	16.4
HCM 6th LOS	B

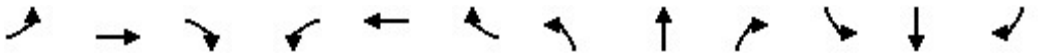
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.850			0.973			0.994			0.989	
Flt Protected	0.950				0.971		0.950			0.950		
Satd. Flow (prot)	1593	1425	0	0	1667	0	1676	4789	0	1676	4765	0
Flt Permitted	0.950						0.950			0.950		
Satd. Flow (perm)	1593	1425	0	0	1717	0	1676	4789	0	1676	4765	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		574			1			7			16	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



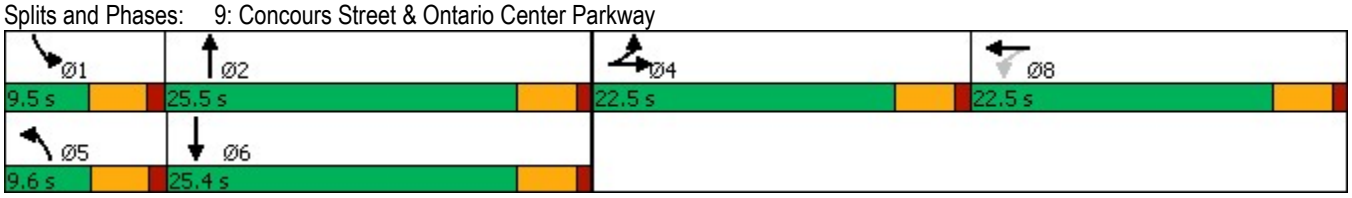
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	2	0	3	3	1	1	38	497	21	1	684	57
Future Volume (vph)	2	0	3	3	1	1	38	497	21	1	684	57
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	2	0	3	3	1	1	42	552	23	1	760	63
Shared Lane Traffic (%)	10%											
Lane Group Flow (vph)	2	3	0	0	5	0	42	575	0	1	823	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	2	0	3	1	38	497	1	684
Future Volume (vph)	2	0	3	1	38	497	1	684
Turn Type	Split	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	4	4		8	5	2	1	6
Permitted Phases			8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	9.6	25.5	9.5	25.4
Total Split (%)	28.1%	28.1%	28.1%	28.1%	12.0%	31.9%	11.9%	31.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	6.0	6.0		6.1	5.5	32.0	5.4	29.5
Actuated g/C Ratio	0.16	0.16		0.17	0.15	0.87	0.15	0.81
v/c Ratio	0.01	0.00		0.02	0.17	0.14	0.00	0.21
Control Delay	19.5	0.0		18.0	20.4	3.9	20.0	4.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	0.0		18.0	20.4	3.9	20.0	4.7
LOS	B	A		B	C	A	B	A
Approach Delay		7.8		18.0		5.0		4.8
Approach LOS		A		B		A		A

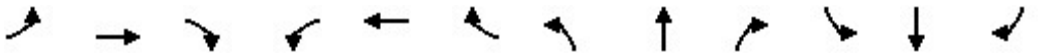
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 36.6	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.21	
Intersection Signal Delay: 4.9	Intersection LOS: A
Intersection Capacity Utilization 34.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	2	3	5	42	575	1	823
v/c Ratio	0.01	0.00	0.02	0.17	0.14	0.00	0.21
Control Delay	19.5	0.0	18.0	20.4	3.9	20.0	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	0.0	18.0	20.4	3.9	20.0	4.7
Queue Length 50th (ft)	0	0	1	6	0	0	0
Queue Length 95th (ft)	6	0	9	38	70	4	102
Internal Link Dist (ft)		319	68		111		176
Turn Bay Length (ft)	170			115		120	
Base Capacity (vph)	842	1024	908	251	4191	246	3837
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.00	0.01	0.17	0.14	0.00	0.21

Intersection Summary



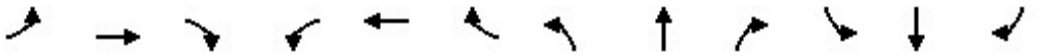
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	3	3	1	1	38	497	21	1	684	57
Future Volume (veh/h)	2	0	3	3	1	1	38	497	21	1	684	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	2	0	3	3	1	1	42	552	23	1	760	63
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	11	0	10	7	2	2	83	1901	79	5	1601	132
Arrive On Green	0.01	0.00	0.01	0.01	0.01	0.01	0.05	0.40	0.40	0.00	0.35	0.35
Sat Flow, veh/h	1688	0	1502	997	332	332	1688	4764	198	1688	4554	376
Grp Volume(v), veh/h	2	0	3	5	0	0	42	373	202	1	537	286
Grp Sat Flow(s),veh/h/ln	1688	0	1502	1662	0	0	1688	1612	1736	1688	1612	1704
Q Serve(g_s), s	0.0	0.0	0.1	0.1	0.0	0.0	0.7	2.4	2.4	0.0	4.0	4.0
Cycle Q Clear(g_c), s	0.0	0.0	0.1	0.1	0.0	0.0	0.7	2.4	2.4	0.0	4.0	4.0
Prop In Lane	1.00		1.00	0.60		0.20	1.00		0.11	1.00		0.22
Lane Grp Cap(c), veh/h	11	0	10	11	0	0	83	1287	693	5	1134	599
V/C Ratio(X)	0.17	0.00	0.29	0.44	0.00	0.00	0.51	0.29	0.29	0.18	0.47	0.48
Avail Cap(c_a), veh/h	989	0	880	974	0	0	280	2204	1187	275	2194	1159
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.2	0.0	15.2	15.2	0.0	0.0	14.2	6.3	6.3	15.3	7.8	7.8
Incr Delay (d2), s/veh	7.0	0.0	15.1	24.9	0.0	0.0	4.7	0.1	0.2	15.1	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	0.1	0.0	0.0	0.3	0.5	0.6	0.0	0.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.2	0.0	30.3	40.0	0.0	0.0	19.0	6.4	6.5	30.4	8.1	8.4
LnGrp LOS	C	A	C	D	A	A	B	A	A	C	A	A
Approach Vol, veh/h		5			5			617			824	
Approach Delay, s/veh		27.1			40.0			7.3			8.2	
Approach LOS		C			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.5	16.8		4.7	6.0	15.3		4.7				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	21.0		18.0	5.1	20.9		18.0				
Max Q Clear Time (g_c+I1), s	2.0	4.4		2.1	2.7	6.0		2.1				
Green Ext Time (p_c), s	0.0	3.4		0.0	0.0	4.8		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		8.0
HCM 6th LOS		A

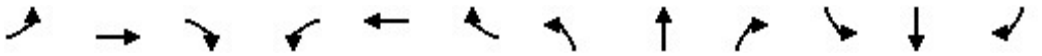
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			234			234			234			273
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



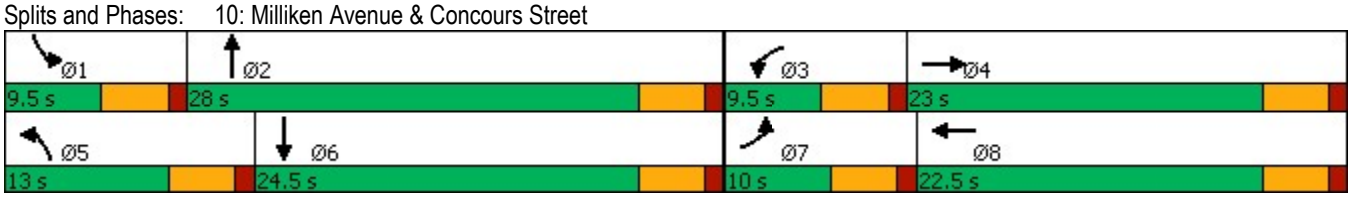
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	70	24	55	60	78	55	158	1024	67	103	1109	235
Future Volume (vph)	70	24	55	60	78	55	158	1024	67	103	1109	235
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	81	28	64	70	91	64	184	1191	78	120	1290	273
Shared Lane Traffic (%)												
Lane Group Flow (vph)	81	28	64	70	91	64	184	1191	78	120	1290	273

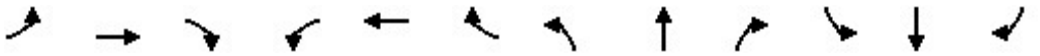
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	24	55	60	78	55	158	1024	67	103	1109	235
Future Volume (vph)	70	24	55	60	78	55	158	1024	67	103	1109	235
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	10.0	23.0		9.5	22.5		13.0	28.0		9.5	24.5	
Total Split (%)	14.3%	32.9%		13.6%	32.1%		18.6%	40.0%		13.6%	35.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	5.6	8.9	56.1	7.4	7.0	56.1	8.0	28.9	56.1	5.1	22.4	56.1
Actuated g/C Ratio	0.10	0.16	1.00	0.13	0.12	1.00	0.14	0.52	1.00	0.09	0.40	1.00
v/c Ratio	0.28	0.05	0.04	0.18	0.22	0.04	0.45	0.38	0.05	0.46	0.53	0.18
Control Delay	28.1	22.7	0.1	25.2	24.7	0.1	27.2	12.4	0.1	32.3	16.0	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	22.7	0.1	25.2	24.7	0.1	27.2	12.4	0.1	32.3	16.0	0.3
LOS	C	C	A	C	C	A	C	B	A	C	B	A
Approach Delay		16.9			17.9			13.6			14.6	
Approach LOS		B			B			B			B	

Intersection Summary			
Cycle Length: 70			
Actuated Cycle Length: 56.1			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.53			
Intersection Signal Delay: 14.5		Intersection LOS: B	
Intersection Capacity Utilization 42.6%		ICU Level of Service A	
Analysis Period (min) 15			

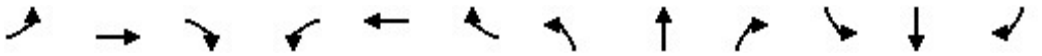
Splits and Phases: 10: Milliken Avenue & Concours Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	81	28	64	70	91	64	184	1191	78	120	1290	273
v/c Ratio	0.28	0.05	0.04	0.18	0.22	0.04	0.45	0.38	0.05	0.46	0.53	0.18
Control Delay	28.1	22.7	0.1	25.2	24.7	0.1	27.2	12.4	0.1	32.3	16.0	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	22.7	0.1	25.2	24.7	0.1	27.2	12.4	0.1	32.3	16.0	0.3
Queue Length 50th (ft)	14	4	0	9	15	0	31	88	0	21	109	0
Queue Length 95th (ft)	31	14	0	28	32	0	56	114	0	42	139	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	288	1124	1500	379	1093	1500	445	3141	1500	261	2422	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.02	0.04	0.18	0.08	0.04	0.41	0.38	0.05	0.46	0.53	0.18

Intersection Summary



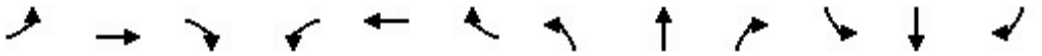
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	24	55	60	78	55	158	1024	67	103	1109	235
Future Volume (veh/h)	70	24	55	60	78	55	158	1024	67	103	1109	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	81	28	0	70	91	0	184	1191	0	120	1290	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	203	350		186	330		285	2197		246	2116	
Arrive On Green	0.07	0.10	0.00	0.06	0.10	0.00	0.10	0.36	0.00	0.08	0.35	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	81	28	0	70	91	0	184	1191	0	120	1290	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	1.2	0.3	0.0	1.1	1.2	0.0	2.8	7.2	0.0	1.8	8.2	0.0
Cycle Q Clear(g_c), s	1.2	0.3	0.0	1.1	1.2	0.0	2.8	7.2	0.0	1.8	8.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	203	350		186	330		285	2197		246	2116	
V/C Ratio(X)	0.40	0.08		0.38	0.28		0.65	0.54		0.49	0.61	
Avail Cap(c_a), veh/h	344	1339		313	1303		532	3080		313	2621	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.7	18.8	0.0	20.9	19.4	0.0	20.2	11.8	0.0	20.3	12.6	0.0
Incr Delay (d2), s/veh	1.3	0.1	0.0	1.3	0.4	0.0	2.4	0.2	0.0	1.5	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.1	0.0	0.4	0.4	0.0	1.0	2.0	0.0	0.6	2.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.0	18.9	0.0	22.1	19.9	0.0	22.6	12.0	0.0	21.8	12.9	0.0
LnGrp LOS	C	B		C	B		C	B		C	B	
Approach Vol, veh/h		109	A		161	A		1375	A		1410	A
Approach Delay, s/veh		21.2			20.9			13.5			13.6	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	21.3	7.5	9.3	9.1	20.6	7.7	9.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	23.5	5.0	18.5	8.5	20.0	5.5	18.0
Max Q Clear Time (g_c+I1), s	3.8	9.2	3.1	2.3	4.8	10.2	3.2	3.2
Green Ext Time (p_c), s	0.0	7.2	0.0	0.1	0.2	6.0	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	14.2
HCM 6th LOS	B

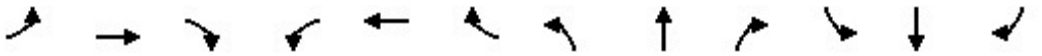
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			236			410			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



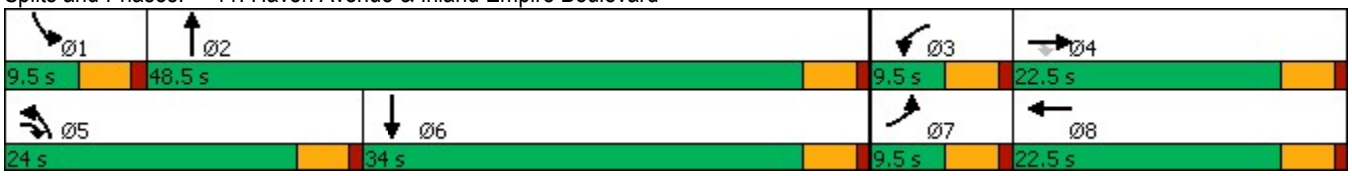
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	90	113	260	118	124	21	498	2218	647	52	1481	128
Future Volume (vph)	90	113	260	118	124	21	498	2218	647	52	1481	128
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	97	122	280	127	133	23	535	2385	696	56	1592	138
Shared Lane Traffic (%)												
Lane Group Flow (vph)	97	122	280	127	133	23	535	2385	696	56	1592	138

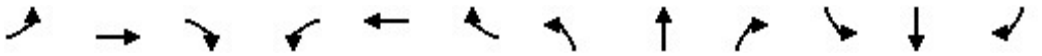
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	113	260	118	124	21	498	2218	647	52	1481	128
Future Volume (vph)	90	113	260	118	124	21	498	2218	647	52	1481	128
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	24.0	9.5	22.5		24.0	48.5		9.5	34.0	
Total Split (%)	10.6%	25.0%	26.7%	10.6%	25.0%		26.7%	53.9%		10.6%	37.8%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.3	8.6	28.3	5.3	8.6	73.9	18.4	48.5	73.9	5.3	29.2	73.9
Actuated g/C Ratio	0.07	0.12	0.38	0.07	0.12	1.00	0.25	0.66	1.00	0.07	0.40	1.00
v/c Ratio	0.47	0.31	0.45	0.45	0.34	0.02	0.75	0.60	0.46	0.27	0.66	0.09
Control Delay	45.5	35.4	15.0	42.6	35.7	0.0	35.3	12.0	1.0	40.3	21.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	35.4	15.0	42.6	35.7	0.0	35.3	12.0	1.0	40.3	21.9	0.1
LOS	D	D	B	D	D	A	D	B	A	D	C	A
Approach Delay		25.9			35.9			13.3			20.8	
Approach LOS		C			D			B			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 73.9	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 17.5	Intersection LOS: B
Intersection Capacity Utilization 62.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	97	122	280	127	133	23	535	2385	696	56	1592	138
v/c Ratio	0.47	0.31	0.45	0.45	0.34	0.02	0.75	0.60	0.46	0.27	0.66	0.09
Control Delay	45.5	35.4	15.0	42.6	35.7	0.0	35.3	12.0	1.0	40.3	21.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	35.4	15.0	42.6	35.7	0.0	35.3	12.0	1.0	40.3	21.9	0.1
Queue Length 50th (ft)	25	30	71	22	33	0	129	241	0	14	196	0
Queue Length 95th (ft)	#54	56	134	42	60	0	#207	306	0	32	249	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	205	858	661	280	858	1500	802	3929	1500	205	2548	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.14	0.42	0.45	0.16	0.02	0.67	0.61	0.46	0.27	0.62	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	113	260	118	124	21	498	2218	647	52	1481	128
Future Volume (veh/h)	90	113	260	118	124	21	498	2218	647	52	1481	128
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	97	122	280	127	133	0	535	2385	0	56	1592	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	157	586	576	227	597		610	3092		127	2080	
Arrive On Green	0.05	0.17	0.17	0.06	0.18	0.00	0.21	0.51	0.00	0.04	0.34	0.00
Sat Flow, veh/h	2910	3367	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	97	122	280	127	133	0	535	2385	0	56	1592	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	2.7	2.6	11.7	2.6	2.8	0.0	14.7	26.2	0.0	1.6	19.3	0.0
Cycle Q Clear(g_c), s	2.7	2.6	11.7	2.6	2.8	0.0	14.7	26.2	0.0	1.6	19.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	157	586	576	227	597		610	3092		127	2080	
V/C Ratio(X)	0.62	0.21	0.49	0.56	0.22		0.88	0.77		0.44	0.77	
Avail Cap(c_a), veh/h	176	733	642	240	733		686	3244		176	2175	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.3	29.3	19.3	38.0	29.1	0.0	31.6	16.5	0.0	38.5	24.3	0.0
Incr Delay (d2), s/veh	5.3	0.2	0.6	2.6	0.2	0.0	11.4	1.1	0.0	2.4	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	1.0	4.0	0.9	1.1	0.0	6.0	8.5	0.0	0.6	6.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.6	29.4	19.9	40.6	29.3	0.0	43.0	17.6	0.0	40.9	25.9	0.0
LnGrp LOS	D	C	B	D	C		D	B		D	C	
Approach Vol, veh/h		499			260	A		2920	A		1648	A
Approach Delay, s/veh		26.8			34.8			22.3			26.4	
Approach LOS		C			C			C			C	

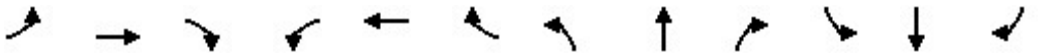
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	46.4	9.2	18.9	21.8	32.7	9.0	19.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	44.0	5.0	18.0	19.5	29.5	5.0	18.0
Max Q Clear Time (g_c+I1), s	3.6	28.2	4.6	13.7	16.7	21.3	4.7	4.8
Green Ext Time (p_c), s	0.0	13.7	0.0	0.7	0.6	6.1	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	24.6
HCM 6th LOS	C

Notes

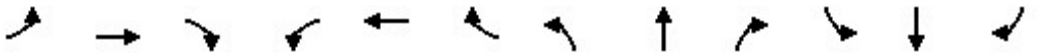
User approved changes to right turn type.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			236			236			236			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



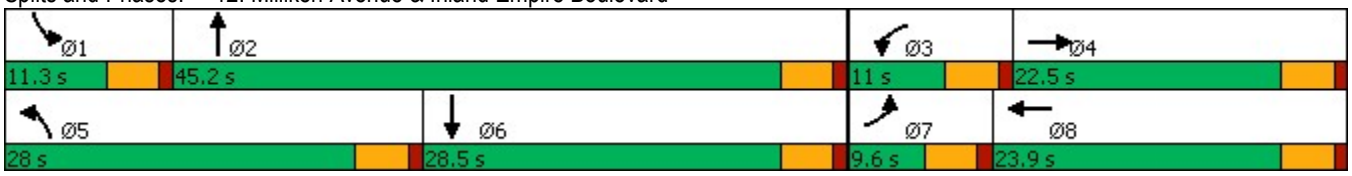
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	71	41	52	99	89	35	406	1121	110	82	983	141
Future Volume (vph)	71	41	52	99	89	35	406	1121	110	82	983	141
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	83	48	60	115	103	41	472	1303	128	95	1143	164
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	48	60	115	103	41	472	1303	128	95	1143	164

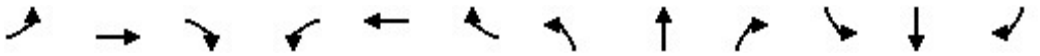
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	41	52	99	89	35	406	1121	110	82	983	141
Future Volume (vph)	71	41	52	99	89	35	406	1121	110	82	983	141
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.6	22.5		11.0	23.9		28.0	45.2		11.3	28.5	
Total Split (%)	10.7%	25.0%		12.2%	26.6%		31.1%	50.2%		12.6%	31.7%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	5.8	7.2	64.1	9.0	8.2	64.1	16.5	37.1	64.1	7.2	21.6	64.1
Actuated g/C Ratio	0.09	0.11	1.00	0.14	0.13	1.00	0.26	0.58	1.00	0.11	0.34	1.00
v/c Ratio	0.32	0.13	0.04	0.28	0.24	0.03	0.63	0.37	0.09	0.29	0.56	0.11
Control Delay	37.1	32.0	0.1	33.4	31.8	0.0	27.6	11.6	0.1	34.6	20.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.1	32.0	0.1	33.4	31.8	0.0	27.6	11.6	0.1	34.6	20.6	0.1
LOS	D	C	A	C	C	A	C	B	A	C	C	A
Approach Delay		24.2			27.5			14.8			19.2	
Approach LOS		C			C			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 64.1	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 17.8	Intersection LOS: B
Intersection Capacity Utilization 50.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	83	48	60	115	103	41	472	1303	128	95	1143	164
v/c Ratio	0.32	0.13	0.04	0.28	0.24	0.03	0.63	0.37	0.09	0.29	0.56	0.11
Control Delay	37.1	32.0	0.1	33.4	31.8	0.0	27.6	11.6	0.1	34.6	20.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.1	32.0	0.1	33.4	31.8	0.0	27.6	11.6	0.1	34.6	20.6	0.1
Queue Length 50th (ft)	18	10	0	25	22	0	97	106	0	20	118	0
Queue Length 95th (ft)	40	26	0	51	45	0	141	130	0	44	165	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	259	1063	1500	419	1146	1500	1197	3954	1500	346	2568	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.05	0.04	0.27	0.09	0.03	0.39	0.33	0.09	0.27	0.45	0.11

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	41	52	99	89	35	406	1121	110	82	983	141
Future Volume (veh/h)	71	41	52	99	89	35	406	1121	110	82	983	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	83	48	0	115	103	0	472	1303	0	95	1143	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	187	290		215	321		620	2769		199	1887	
Arrive On Green	0.06	0.09	0.00	0.07	0.10	0.00	0.21	0.45	0.00	0.07	0.31	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	83	48	0	115	103	0	472	1303	0	95	1143	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	1.6	0.7	0.0	2.2	1.6	0.0	8.6	8.4	0.0	1.8	9.0	0.0
Cycle Q Clear(g_c), s	1.6	0.7	0.0	2.2	1.6	0.0	8.6	8.4	0.0	1.8	9.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	187	290		215	321		620	2769		199	1887	
V/C Ratio(X)	0.44	0.17		0.54	0.32		0.76	0.47		0.48	0.61	
Avail Cap(c_a), veh/h	262	1069		334	1152		1207	4377		349	2581	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.5	24.0	0.0	25.3	23.9	0.0	20.9	10.7	0.0	25.4	16.6	0.0
Incr Delay (d2), s/veh	1.6	0.3	0.0	2.1	0.6	0.0	2.0	0.1	0.0	1.8	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.3	0.0	0.8	0.6	0.0	2.8	2.4	0.0	0.6	2.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.2	24.3	0.0	27.4	24.5	0.0	22.9	10.9	0.0	27.2	16.9	0.0
LnGrp LOS	C	C		C	C		C	B		C	B	
Approach Vol, veh/h		131	A		218	A		1775	A		1238	A
Approach Delay, s/veh		26.1			26.0			14.1			17.7	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	30.2	8.7	9.4	16.6	22.0	8.1	9.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.8	40.7	6.5	18.0	23.5	24.0	5.1	19.4
Max Q Clear Time (g_c+I1), s	3.8	10.4	4.2	2.7	10.6	11.0	3.6	3.6
Green Ext Time (p_c), s	0.1	11.7	0.1	0.1	1.5	6.5	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	16.7
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.940	0.850				
Flt Protected	0.971					
Satd. Flow (prot)	2951	1365	6071	0	0	6071
Flt Permitted	0.971					
Satd. Flow (perm)	2951	1365	6071	0	0	6071
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	1	1				
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

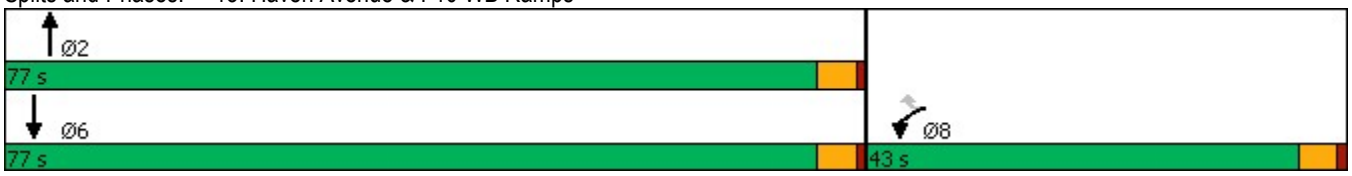
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	505	726	2730	0	0	1589
Future Volume (vph)	505	726	2730	0	0	1589
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	555	798	3000	0	0	1746
Shared Lane Traffic (%)		46%				
Lane Group Flow (vph)	922	431	3000	0	0	1746

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	505	726	2730	1589
Future Volume (vph)	505	726	2730	1589
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	43.0	43.0	77.0	77.0
Total Split (%)	35.8%	35.8%	64.2%	64.2%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	38.5	38.5	72.5	72.5
Actuated g/C Ratio	0.32	0.32	0.60	0.60
v/c Ratio	0.97	0.98	0.82	0.48
Control Delay	64.1	80.3	21.0	13.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	64.1	80.3	21.0	13.7
LOS	E	F	C	B
Approach Delay	69.2		21.0	13.7
Approach LOS	E		C	B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 29.6	Intersection LOS: C
Intersection Capacity Utilization 82.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps



Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	922	431	3000	1746
v/c Ratio	0.97	0.98	0.82	0.48
Control Delay	64.1	80.3	21.0	13.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	64.1	80.3	21.0	13.7
Queue Length 50th (ft)	361	362	497	205
Queue Length 95th (ft)	#502	#598	546	233
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	947	438	3667	3667
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.97	0.98	0.82	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

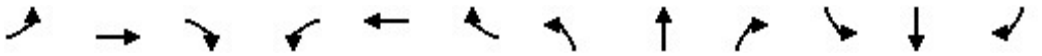
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	505	726	2730	0	0	1589
Future Volume (veh/h)	505	726	2730	0	0	1589
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1673	1772	1772	0	0	1772
Adj Flow Rate, veh/h	451	909	3000	0	0	1746
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	512	965	3671	0	0	3671
Arrive On Green	0.32	0.32	0.60	0.00	0.00	0.60
Sat Flow, veh/h	1594	3003	6592	0	0	6592
Grp Volume(v), veh/h	451	909	3000	0	0	1746
Grp Sat Flow(s),veh/h/ln	1594	1502	1524	0	0	1524
Q Serve(g_s), s	31.5	34.7	45.4	0.0	0.0	18.8
Cycle Q Clear(g_c), s	31.5	34.7	45.4	0.0	0.0	18.8
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	512	965	3671	0	0	3671
V/C Ratio(X)	0.88	0.94	0.82	0.00	0.00	0.48
Avail Cap(c_a), veh/h	521	983	3755	0	0	3755
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	37.8	38.9	18.3	0.0	0.0	13.0
Incr Delay (d2), s/veh	15.8	16.5	1.5	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.4	14.8	15.3	0.0	0.0	6.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	53.6	55.3	19.8	0.0	0.0	13.1
LnGrp LOS	D	E	B	A	A	B
Approach Vol, veh/h	1360		3000			1746
Approach Delay, s/veh	54.8		19.8			13.1
Approach LOS	D		B			B

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		75.4			75.4	42.3
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		72.5			72.5	38.5
Max Q Clear Time (g_c+I1), s		47.4			20.8	36.7
Green Ext Time (p_c), s		23.5			21.9	1.1

Intersection Summary	
HCM 6th Ctrl Delay	25.7
HCM 6th LOS	C

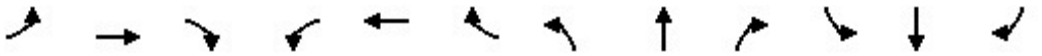
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			266			182			338			235
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



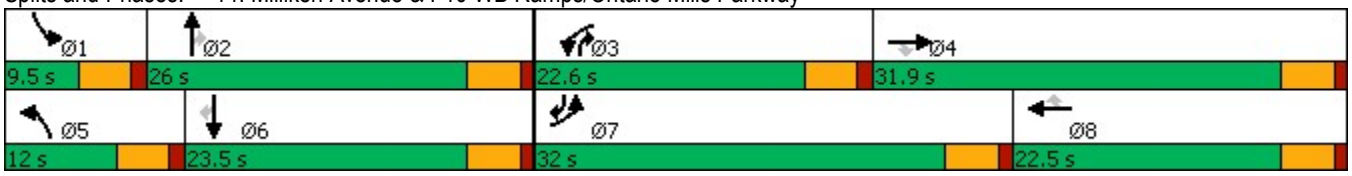
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	653	89	237	162	185	34	154	899	301	83	705	253
Future Volume (vph)	653	89	237	162	185	34	154	899	301	83	705	253
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	734	100	266	182	208	38	173	1010	338	93	792	284
Shared Lane Traffic (%)												
Lane Group Flow (vph)	734	100	266	182	208	38	173	1010	338	93	792	284

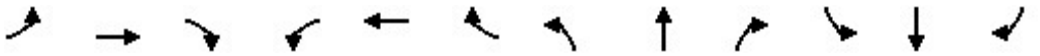
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	653	89	237	162	185	34	154	899	301	83	705	253
Future Volume (vph)	653	89	237	162	185	34	154	899	301	83	705	253
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	32.0	31.9	31.9	22.6	22.5	22.5	12.0	26.0	22.6	9.5	23.5	32.0
Total Split (%)	35.6%	35.4%	35.4%	25.1%	25.0%	25.0%	13.3%	28.9%	25.1%	10.6%	26.1%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	24.3	24.1	24.1	10.5	10.2	10.2	7.5	22.1	37.2	5.1	17.2	46.1
Actuated g/C Ratio	0.31	0.31	0.31	0.14	0.13	0.13	0.10	0.28	0.48	0.07	0.22	0.59
v/c Ratio	0.81	0.18	0.41	0.47	0.47	0.11	0.62	0.58	0.38	0.49	0.59	0.29
Control Delay	33.2	21.6	5.2	36.2	36.1	0.6	46.7	27.0	3.0	47.5	29.6	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.2	21.6	5.2	36.2	36.1	0.6	46.7	27.0	3.0	47.5	29.6	2.6
LOS	C	C	A	D	D	A	D	C	A	D	C	A
Approach Delay		25.4			33.0			23.9			24.5	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 77.6	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 25.4	Intersection LOS: C
Intersection Capacity Utilization 60.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway

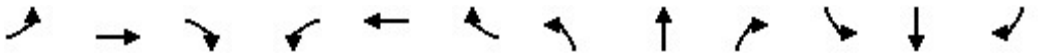




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	734	100	266	182	208	38	173	1010	338	93	792	284
v/c Ratio	0.81	0.18	0.41	0.47	0.47	0.11	0.62	0.58	0.38	0.49	0.59	0.29
Control Delay	33.2	21.6	5.2	36.2	36.1	0.6	46.7	27.0	3.0	47.5	29.6	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.2	21.6	5.2	36.2	36.1	0.6	46.7	27.0	3.0	47.5	29.6	2.6
Queue Length 50th (ft)	172	36	0	45	53	0	45	134	0	24	105	9
Queue Length 95th (ft)	246	76	51	74	85	0	#88	175	41	#52	141	40
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	1038	632	707	683	788	491	283	1753	1012	188	1507	1045
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.16	0.38	0.27	0.26	0.08	0.61	0.58	0.33	0.49	0.53	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	653	89	237	162	185	34	154	899	301	83	705	253
Future Volume (veh/h)	653	89	237	162	185	34	154	899	301	83	705	253
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	734	100	266	182	208	38	173	1010	338	93	792	284
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	864	545	462	271	348	155	247	1680	554	176	1532	823
Arrive On Green	0.30	0.31	0.31	0.09	0.10	0.10	0.08	0.28	0.28	0.06	0.25	0.25
Sat Flow, veh/h	2910	1772	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	734	100	266	182	208	38	173	1010	338	93	792	284
Grp Sat Flow(s),veh/h/ln	1455	1772	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	16.2	2.8	10.2	4.1	4.0	1.6	4.0	9.8	12.5	2.1	7.6	7.2
Cycle Q Clear(g_c), s	16.2	2.8	10.2	4.1	4.0	1.6	4.0	9.8	12.5	2.1	7.6	7.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	864	545	462	271	348	155	247	1680	554	176	1532	823
V/C Ratio(X)	0.85	0.18	0.58	0.67	0.60	0.24	0.70	0.60	0.61	0.53	0.52	0.34
Avail Cap(c_a), veh/h	1170	710	602	770	886	395	319	1917	612	213	1694	863
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.6	17.4	19.9	30.0	29.3	28.2	30.4	21.5	17.6	31.2	22.0	8.6
Incr Delay (d2), s/veh	4.6	0.2	1.1	2.9	1.6	0.8	4.6	0.4	1.5	2.4	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	1.1	3.5	1.5	1.6	0.6	1.5	3.3	4.2	0.8	2.6	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.2	17.5	21.1	32.9	30.9	29.0	35.1	21.9	19.1	33.6	22.3	8.8
LnGrp LOS	C	B	C	C	C	C	D	C	B	C	C	A
Approach Vol, veh/h		1100			428			1521			1169	
Approach Delay, s/veh		24.8			31.6			22.8			19.9	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	23.4	10.9	25.5	10.3	21.7	24.8	11.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	21.5	18.1	27.4	7.5	19.0	27.5	18.0
Max Q Clear Time (g_c+I1), s	4.1	14.5	6.1	12.2	6.0	9.6	18.2	6.0
Green Ext Time (p_c), s	0.0	4.3	0.4	1.3	0.1	4.4	2.1	1.0

Intersection Summary	
HCM 6th Ctrl Delay	23.4
HCM 6th LOS	C

Notes

User approved changes to right turn type.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.993	0.850				
Flt Protected	0.954					
Satd. Flow (prot)	3063	1365	0	6071	6071	0
Flt Permitted	0.954					
Satd. Flow (perm)	3063	1365	0	6071	6071	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	3	3				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

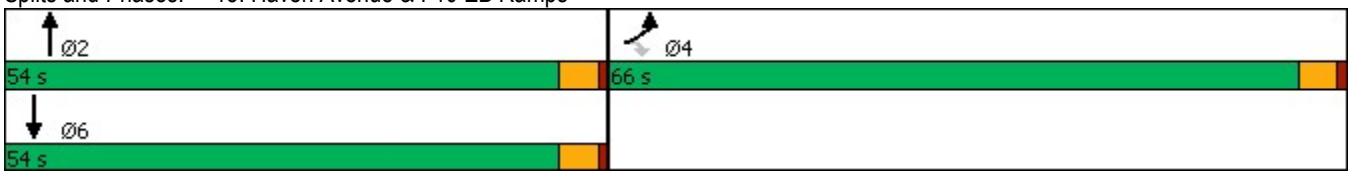
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	1298	592	0	1764	1575	0
Future Volume (vph)	1298	592	0	1764	1575	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1458	665	0	1982	1770	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	1525	598	0	1982	1770	0

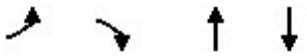
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1298	592	1764	1575
Future Volume (vph)	1298	592	1764	1575
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	66.0	66.0	54.0	54.0
Total Split (%)	55.0%	55.0%	45.0%	45.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	61.3	61.3	49.3	49.3
Actuated g/C Ratio	0.51	0.51	0.41	0.41
v/c Ratio	0.97	0.85	0.79	0.71
Control Delay	45.6	39.0	33.6	31.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	45.6	39.0	33.6	31.1
LOS	D	D	C	C
Approach Delay	43.8		33.6	31.1
Approach LOS	D		C	C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.6	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 36.5	Intersection LOS: D
Intersection Capacity Utilization 82.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1525	598	1982	1770
v/c Ratio	0.97	0.85	0.79	0.71
Control Delay	45.6	39.0	33.6	31.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	45.6	39.0	33.6	31.1
Queue Length 50th (ft)	569	424	383	325
Queue Length 95th (ft)	#736	#668	424	363
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	1576	703	2512	2512
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.97	0.85	0.79	0.70

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1298	592	0	1764	1575	0
Future Volume (veh/h)	1298	592	0	1764	1575	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1772	0	1772	1772	0
Adj Flow Rate, veh/h	1458	665	0	1982	1770	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	1613	760	0	2516	2516	0
Arrive On Green	0.51	0.51	0.00	0.41	0.41	0.00
Sat Flow, veh/h	3188	1502	0	6592	6592	0
Grp Volume(v), veh/h	1458	665	0	1982	1770	0
Grp Sat Flow(s),veh/h/ln	1594	1502	0	1524	1524	0
Q Serve(g_s), s	46.1	43.5	0.0	31.4	26.6	0.0
Cycle Q Clear(g_c), s	46.1	43.5	0.0	31.4	26.6	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	1613	760	0	2516	2516	0
V/C Ratio(X)	0.90	0.88	0.00	0.79	0.70	0.00
Avail Cap(c_a), veh/h	1769	833	0	2723	2723	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.9	24.3	0.0	28.3	26.9	0.0
Incr Delay (d2), s/veh	6.6	9.7	0.0	1.5	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.0	16.7	0.0	11.4	9.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	31.5	34.0	0.0	29.8	27.7	0.0
LnGrp LOS	C	C	A	C	C	A
Approach Vol, veh/h	2123			1982	1770	
Approach Delay, s/veh	32.3			29.8	27.7	
Approach LOS	C			C	C	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		50.2		60.6		50.2
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		49.5		61.5		49.5
Max Q Clear Time (g_c+I1), s		33.4		48.1		28.6
Green Ext Time (p_c), s		12.4		7.9		13.6

Intersection Summary	
HCM 6th Ctrl Delay	30.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1600	1800	1600	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2891	1500	2891	6071	6071	1500
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2891	1500	2891	6071	6071	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		7				424
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	654	587	159	703	733	383
Future Volume (vph)	654	587	159	703	733	383
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	752	675	183	808	843	440
Shared Lane Traffic (%)						
Lane Group Flow (vph)	752	675	183	808	843	440

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	654	587	159	703	733	383
Future Volume (vph)	654	587	159	703	733	383
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	38.0	27.0	27.0	52.0	25.0	38.0
Total Split (%)	42.2%	30.0%	30.0%	57.8%	27.8%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	24.1	41.1	12.3	33.8	16.9	45.7
Actuated g/C Ratio	0.36	0.61	0.18	0.50	0.25	0.68
v/c Ratio	0.73	0.74	0.35	0.27	0.56	0.38
Control Delay	24.4	15.0	27.8	10.2	25.0	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	15.0	27.8	10.2	25.0	1.7
LOS	C	B	C	B	C	A
Approach Delay	20.0			13.5	17.0	
Approach LOS	B			B	B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 67.4	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 17.2	Intersection LOS: B
Intersection Capacity Utilization 57.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

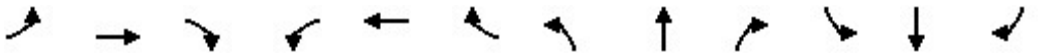
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	752	675	183	808	843	440
v/c Ratio	0.73	0.74	0.35	0.27	0.56	0.38
Control Delay	24.4	15.0	27.8	10.2	25.0	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	15.0	27.8	10.2	25.0	1.7
Queue Length 50th (ft)	129	171	34	50	83	2
Queue Length 95th (ft)	237	294	69	84	152	29
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	1508	1169	1013	4482	1938	1320
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.58	0.18	0.18	0.43	0.33

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	654	587	159	703	733	383
Future Volume (veh/h)	654	587	159	703	733	383
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1772	1575	1772	1772	1772
Adj Flow Rate, veh/h	752	675	183	808	843	440
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1325	828	279	2471	1463	1044
Arrive On Green	0.46	0.46	0.10	0.41	0.24	0.24
Sat Flow, veh/h	2910	1502	2910	6343	6343	1502
Grp Volume(v), veh/h	752	675	183	808	843	440
Grp Sat Flow(s),veh/h/ln	1455	1502	1455	1524	1524	1502
Q Serve(g_s), s	12.3	23.7	3.9	5.9	7.9	8.2
Cycle Q Clear(g_c), s	12.3	23.7	3.9	5.9	7.9	8.2
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1325	828	279	2471	1463	1044
V/C Ratio(X)	0.57	0.82	0.66	0.33	0.58	0.42
Avail Cap(c_a), veh/h	1507	922	1012	4476	1932	1160
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.9	11.8	28.2	13.2	21.7	4.2
Incr Delay (d2), s/veh	0.4	5.2	2.6	0.1	0.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	18.8	1.4	1.8	2.7	6.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.3	17.1	30.8	13.3	22.0	4.5
LnGrp LOS	B	B	C	B	C	A
Approach Vol, veh/h	1427			991	1283	
Approach Delay, s/veh	15.1			16.5	16.0	
Approach LOS	B			B	B	

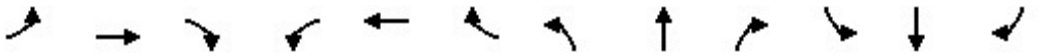
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		30.7		34.0	10.7	20.0
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		47.5		33.5	22.5	20.5
Max Q Clear Time (g_c+I1), s		7.9		25.7	5.9	10.2
Green Ext Time (p_c), s		6.8		3.8	0.5	5.4

Intersection Summary	
HCM 6th Ctrl Delay	15.8
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.955				0.850			0.850		0.973	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4601	0	2891	3353	1500	2891	4818	1500	2891	5907	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4601	0	2891	3353	1500	2891	4818	1500	2891	5907	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		87				136			177		57	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	364	710	300	200	597	125	334	1733	263	198	1696	370
Future Volume (vph)	364	710	300	200	597	125	334	1733	263	198	1696	370
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	396	772	326	217	649	136	363	1884	286	215	1843	402
Shared Lane Traffic (%)												
Lane Group Flow (vph)	396	1098	0	217	649	136	363	1884	286	215	2245	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	364	710	200	597	125	334	1733	263	198	1696
Future Volume (vph)	364	710	200	597	125	334	1733	263	198	1696
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	22.0	37.0	14.0	29.0	29.0	14.0	57.0		12.0	55.0
Total Split (%)	18.3%	30.8%	11.7%	24.2%	24.2%	11.7%	47.5%		10.0%	45.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	17.5	32.5	9.5	24.5	24.5	9.5	52.5	120.0	7.5	50.5
Actuated g/C Ratio	0.15	0.27	0.08	0.20	0.20	0.08	0.44	1.00	0.06	0.42
v/c Ratio	0.94	0.84	0.95	0.95	0.33	1.59	0.89	0.19	1.19	0.89
Control Delay	82.3	44.7	103.6	71.4	8.9	322.0	37.9	0.3	176.8	36.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.3	44.7	103.6	71.4	8.9	322.0	37.9	0.3	176.8	36.9
LOS	F	D	F	E	A	F	D	A	F	D
Approach Delay		54.7		69.9			74.4			49.2
Approach LOS		D		E			E			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.59	
Intersection Signal Delay: 61.6	Intersection LOS: E
Intersection Capacity Utilization 88.5%	ICU Level of Service E
Analysis Period (min) 15	

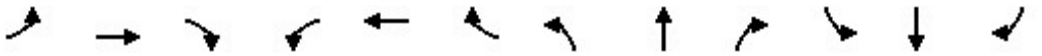
Splits and Phases: 1: Haven Avenue & 4th Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	396	1098	217	649	136	363	1884	286	215	2245
v/c Ratio	0.94	0.84	0.95	0.95	0.33	1.59	0.89	0.19	1.19	0.89
Control Delay	82.3	44.7	103.6	71.4	8.9	322.0	37.9	0.3	176.8	36.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.3	44.7	103.6	71.4	8.9	322.0	37.9	0.3	176.8	36.9
Queue Length 50th (ft)	158	273	87	263	0	~206	484	0	~103	451
Queue Length 95th (ft)	#255	332	#166	#380	53	#305	557	0	#184	506
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	421	1309	228	684	414	228	2107	1500	180	2518
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.84	0.95	0.95	0.33	1.59	0.89	0.19	1.19	0.89

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



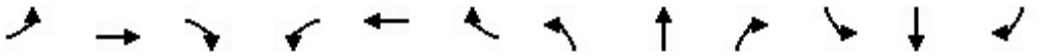
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	364	710	300	200	597	125	334	1733	263	198	1696	370
Future Volume (veh/h)	364	710	300	200	597	125	334	1733	263	198	1696	370
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	396	772	326	217	649	136	363	1884	0	215	1843	402
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	424	906	379	230	687	307	230	2116		182	2124	462
Arrive On Green	0.15	0.27	0.27	0.08	0.20	0.20	0.08	0.44	0.00	0.06	0.42	0.42
Sat Flow, veh/h	2910	3344	1400	2910	3367	1502	2910	4837	1502	2910	5047	1098
Grp Volume(v), veh/h	396	744	354	217	649	136	363	1884	0	215	1669	576
Grp Sat Flow(s),veh/h/ln	1455	1612	1520	1455	1683	1502	1455	1612	1502	1455	1524	1574
Q Serve(g_s), s	16.1	26.2	26.6	8.9	22.8	9.5	9.5	43.1	0.0	7.5	40.0	40.1
Cycle Q Clear(g_c), s	16.1	26.2	26.6	8.9	22.8	9.5	9.5	43.1	0.0	7.5	40.0	40.1
Prop In Lane	1.00		0.92	1.00		1.00	1.00		1.00	1.00		0.70
Lane Grp Cap(c), veh/h	424	873	412	230	687	307	230	2116		182	1924	662
V/C Ratio(X)	0.93	0.85	0.86	0.94	0.94	0.44	1.58	0.89		1.18	0.87	0.87
Avail Cap(c_a), veh/h	424	873	412	230	687	307	230	2116		182	1924	662
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.7	41.5	41.6	55.0	47.1	41.8	55.3	31.1	0.0	56.3	31.7	31.7
Incr Delay (d2), s/veh	27.6	8.1	16.5	43.3	21.7	1.0	278.9	6.1	0.0	124.3	5.6	14.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	11.3	11.8	4.6	11.6	3.6	12.4	17.5	0.0	5.9	15.4	17.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.3	49.6	58.1	98.3	68.8	42.8	334.2	37.2	0.0	180.5	37.3	46.3
LnGrp LOS	E	D	E	F	E	D	F	D		F	D	D
Approach Vol, veh/h		1494			1002			2247	A		2460	
Approach Delay, s/veh		59.2			71.6			85.2			51.9	
Approach LOS		E			E			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	57.0	14.0	37.0	14.0	55.0	22.0	29.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	52.5	9.5	32.5	9.5	50.5	17.5	24.5
Max Q Clear Time (g_c+I1), s	9.5	45.1	10.9	28.6	11.5	42.1	18.1	24.8
Green Ext Time (p_c), s	0.0	6.2	0.0	2.5	0.0	7.3	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	66.6
HCM 6th LOS	E

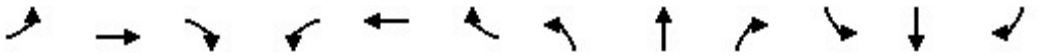
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt						0.850			0.850		0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	6071	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	6071	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				203			133		246	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	4	1961	5	1	1195	193	15	0	9	151	0	12
Future Volume (vph)	4	1961	5	1	1195	193	15	0	9	151	0	12
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	4	2064	5	1	1258	203	16	0	9	159	0	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	2069	0	1	1258	203	16	0	9	159	13	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	4	1961	1	1195	193	15	9	151	0
Future Volume (vph)	4	1961	1	1195	193	15	9	151	0
Turn Type	Prot	NA	Prot	NA	Perm	Prot	Perm	Prot	NA
Protected Phases	7	4	3	8		5		1	6
Permitted Phases					8		2		
Detector Phase	7	4	3	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.5	42.4	9.5	42.4	42.4	11.8	23.7	14.4	26.3
Total Split (%)	10.6%	47.1%	10.6%	47.1%	47.1%	13.1%	26.3%	16.0%	29.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.0	37.4	5.0	37.4	37.4	6.2	5.5	9.9	17.9
Actuated g/C Ratio	0.07	0.55	0.07	0.55	0.55	0.09	0.08	0.15	0.26
v/c Ratio	0.03	0.62	0.01	0.48	0.22	0.11	0.04	0.69	0.01
Control Delay	32.2	11.9	32.0	10.5	2.2	31.6	0.3	46.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	11.9	32.0	10.5	2.2	31.6	0.3	46.8	0.0
LOS	C	B	C	B	A	C	A	D	A
Approach Delay		12.0		9.4					43.3
Approach LOS		B		A					D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 68.1	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 12.4	Intersection LOS: B
Intersection Capacity Utilization 54.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	4	2069	1	1258	203	16	9	159	13
v/c Ratio	0.03	0.62	0.01	0.48	0.22	0.11	0.04	0.69	0.01
Control Delay	32.2	11.9	32.0	10.5	2.2	31.6	0.3	46.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	11.9	32.0	10.5	2.2	31.6	0.3	46.8	0.0
Queue Length 50th (ft)	2	145	0	99	0	6	0	62	0
Queue Length 95th (ft)	11	246	5	178	31	25	0	#169	0
Internal Link Dist (ft)		2546		362					358
Turn Bay Length (ft)	130		130		145	165	165	50	
Base Capacity (vph)	116	3393	116	2693	927	170	519	231	1083
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.61	0.01	0.47	0.22	0.09	0.02	0.69	0.01

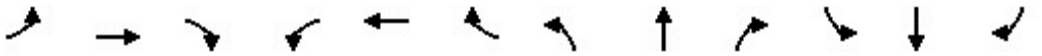
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1961	5	1	1195	193	15	0	9	151	0	12
Future Volume (veh/h)	4	1961	5	1	1195	193	15	0	9	151	0	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	4	2064	5	1	1258	203	16	0	9	159	0	13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	9	3221	8	3	2444	759	31	141	120	195	307	274
Arrive On Green	0.01	0.51	0.51	0.00	0.51	0.51	0.02	0.00	0.08	0.12	0.00	0.18
Sat Flow, veh/h	1594	6325	15	1594	4837	1502	1594	1772	1502	1594	1683	1502
Grp Volume(v), veh/h	4	1492	577	1	1258	203	16	0	9	159	0	13
Grp Sat Flow(s),veh/h/ln	1594	1524	1769	1594	1612	1502	1594	1772	1502	1594	1683	1502
Q Serve(g_s), s	0.2	14.9	14.9	0.0	10.9	4.8	0.6	0.0	0.3	6.1	0.0	0.4
Cycle Q Clear(g_c), s	0.2	14.9	14.9	0.0	10.9	4.8	0.6	0.0	0.3	6.1	0.0	0.4
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	9	2328	901	3	2444	759	31	141	120	195	307	274
V/C Ratio(X)	0.47	0.64	0.64	0.39	0.51	0.27	0.52	0.00	0.08	0.82	0.00	0.05
Avail Cap(c_a), veh/h	127	2767	1071	127	2927	909	186	543	460	252	586	523
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.1	11.2	11.2	31.2	10.4	8.9	30.4	0.0	26.7	26.8	0.0	21.1
Incr Delay (d2), s/veh	34.9	0.4	1.0	77.1	0.2	0.2	12.7	0.0	0.3	14.7	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	4.3	5.1	0.1	3.3	1.4	0.3	0.0	0.1	3.0	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.9	11.6	12.2	108.4	10.5	9.1	43.2	0.0	26.9	41.5	0.0	21.2
LnGrp LOS	E	B	B	F	B	A	D	A	C	D	A	C
Approach Vol, veh/h		2073			1462			25			172	
Approach Delay, s/veh		11.8			10.4			37.3			40.0	
Approach LOS		B			B			D			D	

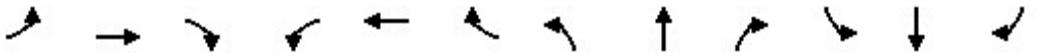
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.1	9.5	4.6	36.4	5.7	15.9	4.8	36.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.9	19.2	5.0	37.9	7.3	21.8	5.0	37.9
Max Q Clear Time (g_c+I1), s	8.1	2.3	2.0	16.9	2.6	2.4	2.2	12.9
Green Ext Time (p_c), s	0.1	0.0	0.0	15.0	0.0	0.0	0.0	11.3

Intersection Summary	
HCM 6th Ctrl Delay	12.7
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.996				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.953	
Satd. Flow (prot)	2891	6065	0	1583	4798	0	1583	1765	1500	0	1682	1500
Flt Permitted	0.950			0.950			0.727				0.731	
Satd. Flow (perm)	2891	6065	0	1583	4798	0	1212	1765	1500	0	1290	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			7				153			94
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



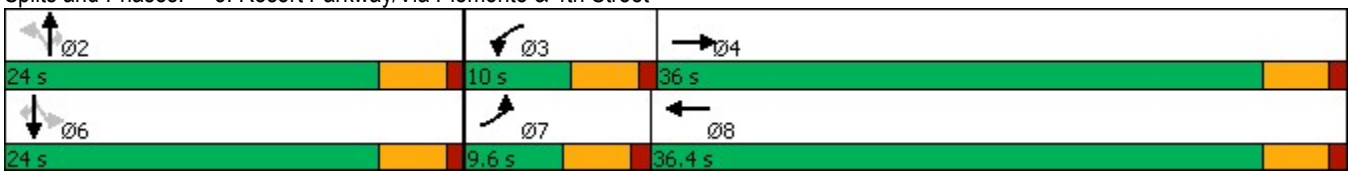
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	29	2082	8	5	1373	38	11	0	20	43	1	20
Future Volume (vph)	29	2082	8	5	1373	38	11	0	20	43	1	20
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	31	2192	8	5	1445	40	12	0	21	45	1	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	2200	0	5	1485	0	12	0	21	0	46	21

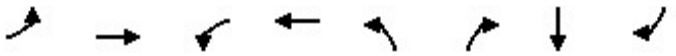
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	29	2082	5	1373	11	20	43	1	20
Future Volume (vph)	29	2082	5	1373	11	20	43	1	20
Turn Type	Prot	NA	Prot	NA	Perm	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8				6	
Permitted Phases					2	2	6		6
Detector Phase	7	4	3	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.6	36.0	10.0	36.4	24.0	24.0	24.0	24.0	24.0
Total Split (%)	13.7%	51.4%	14.3%	52.0%	34.3%	34.3%	34.3%	34.3%	34.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min
Act Effct Green (s)	5.2	33.7	5.6	32.1	7.3	7.3		7.3	7.3
Actuated g/C Ratio	0.10	0.65	0.11	0.62	0.14	0.14		0.14	0.14
v/c Ratio	0.11	0.56	0.03	0.50	0.07	0.06		0.26	0.07
Control Delay	25.0	6.5	24.6	7.2	22.2	0.3		25.2	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	25.0	6.5	24.6	7.2	22.2	0.3		25.2	0.5
LOS	C	A	C	A	C	A		C	A
Approach Delay		6.7		7.3				17.4	
Approach LOS		A		A				B	

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 51.8	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 7.2	Intersection LOS: A
Intersection Capacity Utilization 51.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street





Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBT	SBR
Lane Group Flow (vph)	31	2200	5	1485	12	21	46	21
v/c Ratio	0.11	0.56	0.03	0.50	0.07	0.06	0.26	0.07
Control Delay	25.0	6.5	24.6	7.2	22.2	0.3	25.2	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.0	6.5	24.6	7.2	22.2	0.3	25.2	0.5
Queue Length 50th (ft)	4	69	1	53	3	0	11	0
Queue Length 95th (ft)	17	198	10	160	16	0	41	0
Internal Link Dist (ft)		362		428			378	
Turn Bay Length (ft)	220		125		115	115		110
Base Capacity (vph)	288	3947	170	2999	462	667	492	630
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.56	0.03	0.50	0.03	0.03	0.09	0.03

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	2082	8	5	1373	38	11	0	20	43	1	20
Future Volume (veh/h)	29	2082	8	5	1373	38	11	0	20	43	1	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	31	2192	8	5	1445	40	12	0	21	45	1	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	104	3717	14	11	2708	75	262	194	164	304	5	164
Arrive On Green	0.04	0.59	0.59	0.01	0.56	0.56	0.11	0.00	0.11	0.11	0.11	0.11
Sat Flow, veh/h	2910	6316	23	1594	4839	134	1312	1772	1502	1355	46	1502
Grp Volume(v), veh/h	31	1586	614	5	963	522	12	0	21	46	0	21
Grp Sat Flow(s),veh/h/ln	1455	1524	1768	1594	1612	1748	1312	1772	1502	1401	0	1502
Q Serve(g_s), s	0.5	10.0	10.0	0.1	8.6	8.6	0.4	0.0	0.6	1.3	0.0	0.6
Cycle Q Clear(g_c), s	0.5	10.0	10.0	0.1	8.6	8.6	1.8	0.0	0.6	1.4	0.0	0.6
Prop In Lane	1.00		0.01	1.00		0.08	1.00		1.00	0.98		1.00
Lane Grp Cap(c), veh/h	104	2690	1040	11	1805	978	262	194	164	309	0	164
V/C Ratio(X)	0.30	0.59	0.59	0.47	0.53	0.53	0.05	0.00	0.13	0.15	0.00	0.13
Avail Cap(c_a), veh/h	325	3151	1218	192	2251	1220	678	756	641	752	0	641
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.5	5.9	5.9	22.6	6.3	6.3	19.5	0.0	18.4	18.7	0.0	18.4
Incr Delay (d2), s/veh	1.6	0.2	0.5	28.3	0.2	0.5	0.1	0.0	0.3	0.2	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.0	2.4	0.1	1.9	2.1	0.1	0.0	0.2	0.4	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.1	6.1	6.5	51.0	6.6	6.8	19.6	0.0	18.7	19.0	0.0	18.7
LnGrp LOS	C	A	A	D	A	A	B	A	B	B	A	B
Approach Vol, veh/h		2231			1490			33			67	
Approach Delay, s/veh		6.5			6.8			19.1			18.9	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	4.8	31.4		9.5	6.1	30.1				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		19.5	5.5	31.5		19.5	5.1	31.9				
Max Q Clear Time (g_c+I1), s		3.8	2.1	12.0		3.4	2.5	10.6				
Green Ext Time (p_c), s		0.0	0.0	14.9		0.2	0.0	11.0				

Intersection Summary												
HCM 6th Ctrl Delay			6.9									
HCM 6th LOS			A									

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.996					0.865
Flt Protected						
Satd. Flow (prot)	4798	0	0	4818	0	1526
Flt Permitted						
Satd. Flow (perm)	4798	0	0	4818	0	1526
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	2089	63	0	1390	0	27
Future Volume (vph)	2089	63	0	1390	0	27
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	2176	66	0	1448	0	28
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2242	0	0	1448	0	28

Intersection Summary

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2089	63	0	1390	0	27
Future Vol, veh/h	2089	63	0	1390	0	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2176	66	0	1448	0	28

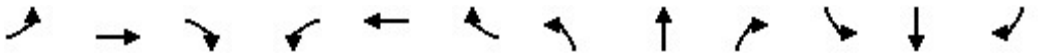
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1121
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	172
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	172
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	30
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	172	-	-	-
HCM Lane V/C Ratio	0.164	-	-	-
HCM Control Delay (s)	30	-	-	-
HCM Lane LOS	D	-	-	-
HCM 95th %tile Q(veh)	0.6	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5955	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5955	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			215			285			55		30	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



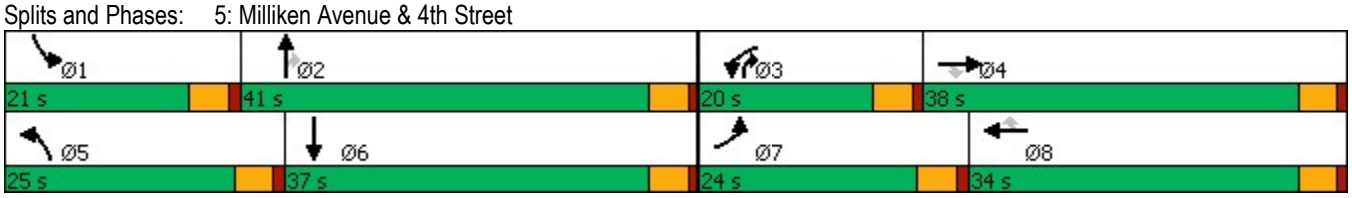
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	440	1267	279	376	1036	326	426	1626	373	462	1020	150
Future Volume (vph)	440	1267	279	376	1036	326	426	1626	373	462	1020	150
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	458	1320	291	392	1079	340	444	1694	389	481	1063	156
Shared Lane Traffic (%)												
Lane Group Flow (vph)	458	1320	291	392	1079	340	444	1694	389	481	1219	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	440	1267	279	376	1036	326	426	1626	373	462	1020
Future Volume (vph)	440	1267	279	376	1036	326	426	1626	373	462	1020
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	24.0	38.0	38.0	20.0	34.0	34.0	25.0	41.0	20.0	21.0	37.0
Total Split (%)	20.0%	31.7%	31.7%	16.7%	28.3%	28.3%	20.8%	34.2%	16.7%	17.5%	30.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	19.5	33.5	33.5	15.5	29.5	29.5	20.2	36.5	56.5	16.5	32.8
Actuated g/C Ratio	0.16	0.28	0.28	0.13	0.25	0.25	0.17	0.30	0.47	0.14	0.27
v/c Ratio	0.98	0.98	0.51	1.05	0.91	0.58	0.91	0.92	0.53	1.21	0.74
Control Delay	86.4	63.6	13.4	110.8	56.3	12.2	73.5	49.3	22.1	160.4	42.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.4	63.6	13.4	110.8	56.3	12.2	73.5	49.3	22.1	160.4	42.0
LOS	F	E	B	F	E	B	E	D	C	F	D
Approach Delay		61.6			59.8			49.4			75.5
Approach LOS		E			E			D			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.21	
Intersection Signal Delay: 60.3	Intersection LOS: E
Intersection Capacity Utilization 94.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 5: Milliken Avenue & 4th Street

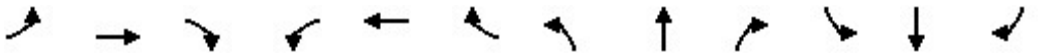


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	458	1320	291	392	1079	340	444	1694	389	481	1219
v/c Ratio	0.98	0.98	0.51	1.05	0.91	0.58	0.91	0.92	0.53	1.21	0.74
Control Delay	86.4	63.6	13.4	110.8	56.3	12.2	73.5	49.3	22.1	160.4	42.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.4	63.6	13.4	110.8	56.3	12.2	73.5	49.3	22.1	160.4	42.0
Queue Length 50th (ft)	184	372	45	~170	298	34	175	367	177	~234	245
Queue Length 95th (ft)	#291	#478	130	#271	#381	126	#269	#423	272	#342	288
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	469	1345	573	373	1184	583	493	1846	735	397	1649
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.98	0.51	1.05	0.91	0.58	0.90	0.92	0.53	1.21	0.74

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

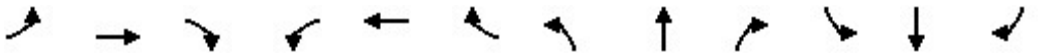
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	440	1267	279	376	1036	326	426	1626	373	462	1020	150
Future Volume (veh/h)	440	1267	279	376	1036	326	426	1626	373	462	1020	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	458	1320	291	392	1079	340	444	1694	389	481	1062	156
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	474	1353	420	377	1192	370	488	1845	649	401	1478	215
Arrive On Green	0.16	0.28	0.28	0.13	0.25	0.25	0.17	0.30	0.30	0.14	0.27	0.27
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	2910	6095	1502	2910	5414	788
Grp Volume(v), veh/h	458	1320	291	392	1079	340	444	1694	389	481	895	323
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1455	1524	1502	1455	1524	1630
Q Serve(g_s), s	18.7	32.4	20.7	15.5	25.9	26.4	17.9	32.1	23.8	16.5	21.2	21.5
Cycle Q Clear(g_c), s	18.7	32.4	20.7	15.5	25.9	26.4	17.9	32.1	23.8	16.5	21.2	21.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.48
Lane Grp Cap(c), veh/h	474	1353	420	377	1192	370	488	1845	649	401	1248	445
V/C Ratio(X)	0.97	0.98	0.69	1.04	0.91	0.92	0.91	0.92	0.60	1.20	0.72	0.73
Avail Cap(c_a), veh/h	474	1353	420	377	1192	370	498	1858	652	401	1248	445
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.8	42.7	38.5	52.1	43.8	44.0	49.0	40.3	26.1	51.6	39.4	39.5
Incr Delay (d2), s/veh	32.7	18.8	4.8	57.3	10.0	27.5	20.6	7.8	1.5	111.5	2.0	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	15.1	8.2	8.6	11.4	12.6	7.9	12.9	8.7	12.2	8.1	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.5	61.5	43.4	109.5	53.8	71.5	69.6	48.1	27.6	163.2	41.4	45.3
LnGrp LOS	F	E	D	F	D	E	E	D	C	F	D	D
Approach Vol, veh/h		2069			1811			2527			1699	
Approach Delay, s/veh		63.6			69.1			48.7			76.6	
Approach LOS		E			E			D			E	

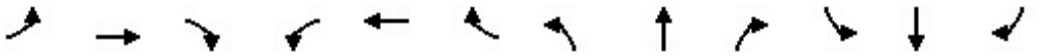
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	40.8	20.0	38.0	24.6	37.2	24.0	34.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	36.5	15.5	33.5	20.5	32.5	19.5	29.5
Max Q Clear Time (g_c+I1), s	18.5	34.1	17.5	34.4	19.9	23.5	20.7	28.4
Green Ext Time (p_c), s	0.0	2.1	0.0	0.0	0.1	5.2	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	62.9
HCM 6th LOS	E



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.922	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2961	1365
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2961	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			125			196			263		217	369
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



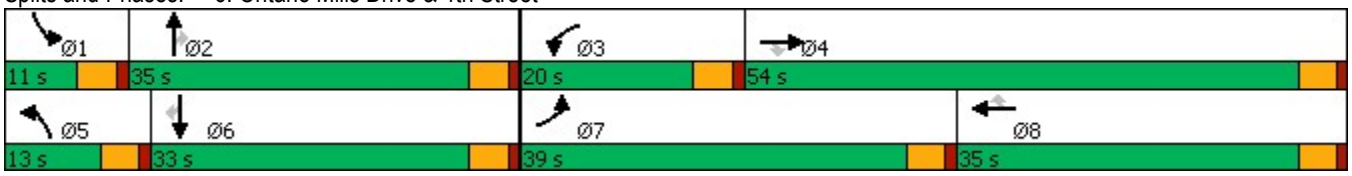
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	986	1413	120	244	1116	456	141	310	360	104	312	680
Future Volume (vph)	986	1413	120	244	1116	456	141	310	360	104	312	680
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1072	1536	130	265	1213	496	153	337	391	113	339	739
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	1072	1536	130	265	1213	496	153	337	391	113	709	369

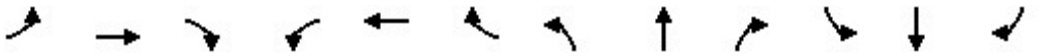
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	986	1413	120	244	1116	456	141	310	360	104	312	680
Future Volume (vph)	986	1413	120	244	1116	456	141	310	360	104	312	680
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	39.0	54.0	54.0	20.0	35.0	35.0	13.0	35.0	35.0	11.0	33.0	33.0
Total Split (%)	32.5%	45.0%	45.0%	16.7%	29.2%	29.2%	10.8%	29.2%	29.2%	9.2%	27.5%	27.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	34.5	50.7	50.7	14.3	30.5	30.5	8.5	28.2	28.2	6.5	26.2	26.2
Actuated g/C Ratio	0.29	0.43	0.43	0.12	0.26	0.26	0.07	0.24	0.24	0.06	0.22	0.22
v/c Ratio	1.27	0.74	0.18	0.75	0.97	0.93	1.34	0.42	0.70	1.30	0.86	0.63
Control Delay	164.9	31.4	4.9	64.5	63.4	51.6	243.4	39.5	20.4	241.4	41.4	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	164.9	31.4	4.9	64.5	63.4	51.6	243.4	39.5	20.4	241.4	41.4	9.0
LOS	F	C	A	E	E	D	F	D	C	F	D	A
Approach Delay		82.4			60.6			66.4			50.3	
Approach LOS		F			E			E			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.8	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.34	
Intersection Signal Delay: 68.3	Intersection LOS: E
Intersection Capacity Utilization 96.7%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 6: Ontario Mills Drive & 4th Street



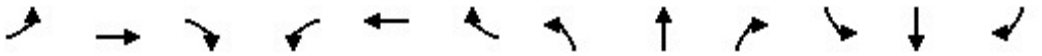


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1072	1536	130	265	1213	496	153	337	391	113	709	369
v/c Ratio	1.27	0.74	0.18	0.75	0.97	0.93	1.34	0.42	0.70	1.30	0.86	0.63
Control Delay	164.9	31.4	4.9	64.5	63.4	51.6	243.4	39.5	20.4	241.4	41.4	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	164.9	31.4	4.9	64.5	63.4	51.6	243.4	39.5	20.4	241.4	41.4	9.0
Queue Length 50th (ft)	~545	369	2	103	344	248	~156	114	86	~113	204	0
Queue Length 95th (ft)	#676	431	40	150	#449	#466	#293	159	203	#234	285	94
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	847	2074	717	380	1248	533	114	868	583	87	881	610
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.27	0.74	0.18	0.70	0.97	0.93	1.34	0.39	0.67	1.30	0.80	0.60

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



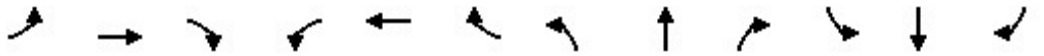
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	986	1413	120	244	1116	456	141	310	360	104	312	680
Future Volume (veh/h)	986	1413	120	244	1116	456	141	310	360	104	312	680
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	1072	1536	130	265	1213	496	153	337	391	113	339	739
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	837	2097	651	315	1229	382	113	856	382	86	421	713
Arrive On Green	0.29	0.43	0.43	0.11	0.25	0.25	0.07	0.25	0.25	0.05	0.24	0.24
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	1594	3367	1502	1594	1772	3003
Grp Volume(v), veh/h	1072	1536	130	265	1213	496	153	337	391	113	339	739
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1594	1683	1502	1594	1772	1502
Q Serve(g_s), s	34.5	31.6	6.4	10.7	30.0	30.5	8.5	10.0	30.5	6.5	21.6	28.5
Cycle Q Clear(g_c), s	34.5	31.6	6.4	10.7	30.0	30.5	8.5	10.0	30.5	6.5	21.6	28.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	837	2097	651	315	1229	382	113	856	382	86	421	713
V/C Ratio(X)	1.28	0.73	0.20	0.84	0.99	1.30	1.36	0.39	1.02	1.31	0.81	1.04
Avail Cap(c_a), veh/h	837	2097	651	376	1229	382	113	856	382	86	421	713
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.8	28.2	21.1	52.5	44.5	44.8	55.8	37.1	44.8	56.8	43.1	45.7
Incr Delay (d2), s/veh	135.7	1.3	0.1	13.8	22.4	152.9	206.9	0.3	52.5	200.3	10.9	43.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	28.0	12.3	2.3	4.5	14.4	27.4	9.9	4.1	16.8	7.4	10.7	14.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	178.5	29.6	21.2	66.3	66.9	197.6	262.6	37.4	97.2	257.1	54.1	89.1
LnGrp LOS	F	C	C	E	E	F	F	D	F	F	D	F
Approach Vol, veh/h		2738			1974			881			1191	
Approach Delay, s/veh		87.5			99.7			103.0			95.1	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	35.0	17.5	56.5	13.0	33.0	39.0	35.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	30.5	15.5	49.5	8.5	28.5	34.5	30.5
Max Q Clear Time (g_c+I1), s	8.5	32.5	12.7	33.6	10.5	30.5	36.5	32.5
Green Ext Time (p_c), s	0.0	0.0	0.3	10.2	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	94.4
HCM 6th LOS	F

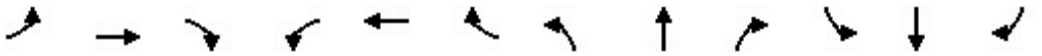
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.973			0.940				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.978	
Satd. Flow (prot)	2891	4818	1500	1583	4688	0	1583	3152	0	1504	1640	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.978	
Satd. Flow (perm)	2891	4818	1500	1583	4688	0	1583	3152	0	1504	1640	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			126		39			60				217
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



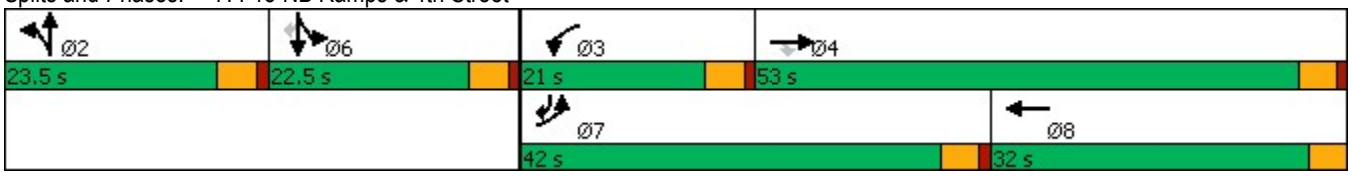
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	913	827	131	79	972	216	152	85	58	197	76	676
Future Volume (vph)	913	827	131	79	972	216	152	85	58	197	76	676
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	951	861	136	82	1013	225	158	89	60	205	79	704
Shared Lane Traffic (%)										32%		
Lane Group Flow (vph)	951	861	136	82	1238	0	158	149	0	139	145	704

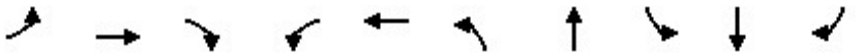
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	913	827	131	79	972	152	85	197	76	676
Future Volume (vph)	913	827	131	79	972	152	85	197	76	676
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	42.0	53.0	53.0	21.0	32.0	23.5	23.5	22.5	22.5	42.0
Total Split (%)	35.0%	44.2%	44.2%	17.5%	26.7%	19.6%	19.6%	18.8%	18.8%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	37.6	56.5	56.5	11.2	28.6	15.5	15.5	14.6	14.6	56.8
Actuated g/C Ratio	0.33	0.50	0.50	0.10	0.25	0.14	0.14	0.13	0.13	0.50
v/c Ratio	0.99	0.36	0.17	0.53	1.02	0.73	0.31	0.72	0.69	0.49
Control Delay	66.1	20.3	5.1	61.4	72.9	67.6	28.1	68.8	64.7	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.1	20.3	5.1	61.4	72.9	67.6	28.1	68.8	64.7	13.9
LOS	E	C	A	E	E	E	C	E	E	B
Approach Delay		41.6			72.2		48.4		29.1	
Approach LOS		D			E		D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 113.4	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 48.2	Intersection LOS: D
Intersection Capacity Utilization 87.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street



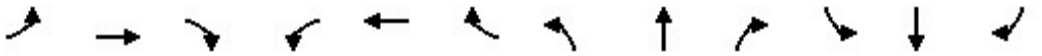


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	951	861	136	82	1238	158	149	139	145	704
v/c Ratio	0.99	0.36	0.17	0.53	1.02	0.73	0.31	0.72	0.69	0.49
Control Delay	66.1	20.3	5.1	61.4	72.9	67.6	28.1	68.8	64.7	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.1	20.3	5.1	61.4	72.9	67.6	28.1	68.8	64.7	13.9
Queue Length 50th (ft)	~373	149	4	59	~358	113	31	105	109	128
Queue Length 95th (ft)	#543	212	44	111	#482	190	63	182	185	190
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	959	2399	810	231	1211	266	579	239	261	1430
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.36	0.17	0.35	1.02	0.59	0.26	0.58	0.56	0.49

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	913	827	131	79	972	216	152	85	58	197	76	676
Future Volume (veh/h)	913	827	131	79	972	216	152	85	58	197	76	676
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	951	861	136	82	1012	225	158	89	60	142	167	704
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	942	2446	759	102	974	216	191	238	148	248	275	1439
Arrive On Green	0.32	0.51	0.51	0.06	0.25	0.25	0.12	0.12	0.12	0.16	0.16	0.16
Sat Flow, veh/h	2910	4837	1502	1594	3960	879	1594	1992	1240	1594	1772	3003
Grp Volume(v), veh/h	951	861	136	82	824	413	158	74	75	142	167	704
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1594	1612	1614	1594	1683	1549	1594	1772	1502
Q Serve(g_s), s	37.5	12.4	5.7	5.9	28.5	28.5	11.2	4.7	5.2	9.6	10.2	18.0
Cycle Q Clear(g_c), s	37.5	12.4	5.7	5.9	28.5	28.5	11.2	4.7	5.2	9.6	10.2	18.0
Prop In Lane	1.00		1.00	1.00		0.54	1.00		0.80	1.00		1.00
Lane Grp Cap(c), veh/h	942	2446	759	102	793	397	191	201	185	248	275	1439
V/C Ratio(X)	1.01	0.35	0.18	0.80	1.04	1.04	0.83	0.37	0.40	0.57	0.61	0.49
Avail Cap(c_a), veh/h	942	2446	759	227	793	397	261	276	254	248	275	1439
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.2	17.2	15.6	53.5	43.7	43.7	49.8	47.0	47.2	45.4	45.6	20.5
Incr Delay (d2), s/veh	31.7	0.1	0.1	13.6	42.4	56.2	14.6	1.1	1.4	3.2	3.8	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.3	4.6	2.0	2.7	15.9	17.4	5.2	2.0	2.1	4.0	4.8	6.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.9	17.3	15.7	67.1	86.1	99.8	64.4	48.1	48.6	48.6	49.4	20.8
LnGrp LOS	F	B	B	E	F	F	E	D	D	D	D	C
Approach Vol, veh/h		1948			1319			307			1013	
Approach Delay, s/veh		43.4			89.2			56.6			29.4	
Approach LOS		D			F			E			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		18.4	11.9	63.1		22.5	42.0	33.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		19.0	16.5	48.5		18.0	37.5	* 29				
Max Q Clear Time (g_c+I1), s		13.2	7.9	14.4		20.0	39.5	30.5				
Green Ext Time (p_c), s		0.6	0.1	7.7		0.0	0.0	0.0				

Intersection Summary	
HCM 6th Ctrl Delay	54.3
HCM 6th LOS	D

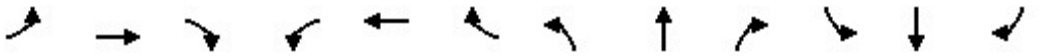
Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.907				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3041	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3041	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		66				149			149			149
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



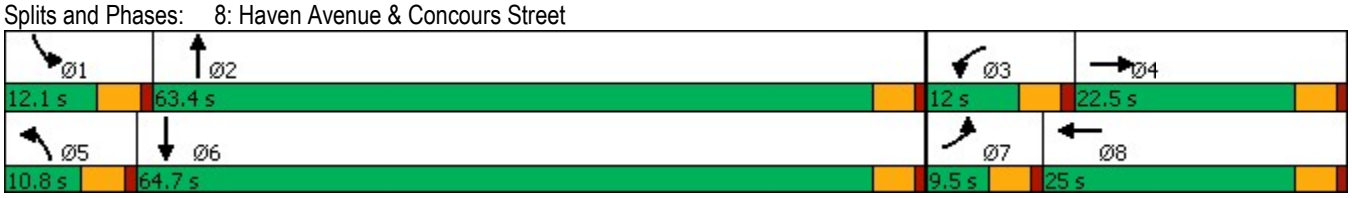
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	26	40	65	226	95	97	48	2579	228	178	2162	28
Future Volume (vph)	26	40	65	226	95	97	48	2579	228	178	2162	28
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	27	41	66	231	97	99	49	2632	233	182	2206	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	107	0	231	97	99	49	2632	233	182	2206	29

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	26	40	226	95	97	48	2579	228	178	2162	28
Future Volume (vph)	26	40	226	95	97	48	2579	228	178	2162	28
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	12.0	25.0		10.8	63.4		12.1	64.7	
Total Split (%)	8.6%	20.5%	10.9%	22.7%		9.8%	57.6%		11.0%	58.8%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.0	7.0	7.5	13.4	99.0	6.1	58.9	99.0	7.6	62.4	99.0
Actuated g/C Ratio	0.05	0.07	0.08	0.14	1.00	0.06	0.59	1.00	0.08	0.63	1.00
v/c Ratio	0.19	0.39	0.78	0.21	0.07	0.27	0.73	0.16	0.82	0.58	0.02
Control Delay	48.8	23.9	63.6	41.3	0.1	48.8	16.0	0.2	74.3	12.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	23.9	63.6	41.3	0.1	48.8	16.0	0.2	74.3	12.0	0.0
LOS	D	C	E	D	A	D	B	A	E	B	A
Approach Delay		28.9		43.8			15.3			16.6	
Approach LOS		C		D			B			B	

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 99	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 18.2	Intersection LOS: B
Intersection Capacity Utilization 68.8%	ICU Level of Service C
Analysis Period (min) 15	

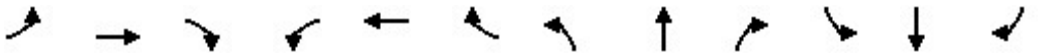
Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	27	107	231	97	99	49	2632	233	182	2206	29
v/c Ratio	0.19	0.39	0.78	0.21	0.07	0.27	0.73	0.16	0.82	0.58	0.02
Control Delay	48.8	23.9	63.6	41.3	0.1	48.8	16.0	0.2	74.3	12.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	23.9	63.6	41.3	0.1	48.8	16.0	0.2	74.3	12.0	0.0
Queue Length 50th (ft)	8	13	51	30	0	15	318	0	59	228	0
Queue Length 95th (ft)	23	39	#93	56	0	35	388	0	#121	281	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	145	606	298	693	1500	183	3611	1500	221	3825	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.18	0.78	0.14	0.07	0.27	0.73	0.16	0.82	0.58	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	40	65	226	95	97	48	2579	228	178	2162	28
Future Volume (veh/h)	26	40	65	226	95	97	48	2579	228	178	2162	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	27	41	66	231	97	0	49	2632	0	182	2206	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	78	114	102	310	400		111	3560		233	3816	
Arrive On Green	0.03	0.07	0.07	0.08	0.12	0.00	0.04	0.58	0.00	0.08	0.63	0.00
Sat Flow, veh/h	2910	1683	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	27	41	66	231	97	0	49	2632	0	182	2206	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	0.9	2.2	4.1	5.4	2.5	0.0	1.6	29.9	0.0	5.8	20.1	0.0
Cycle Q Clear(g_c), s	0.9	2.2	4.1	5.4	2.5	0.0	1.6	29.9	0.0	5.8	20.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	78	114	102	310	400		111	3560		233	3816	
V/C Ratio(X)	0.35	0.36	0.65	0.75	0.24		0.44	0.74		0.78	0.58	
Avail Cap(c_a), veh/h	154	320	285	314	729		194	3790		233	3873	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	45.3	42.2	43.1	42.8	37.9	0.0	44.6	14.4	0.0	42.7	10.4	0.0
Incr Delay (d2), s/veh	2.6	1.9	6.8	9.3	0.3	0.0	2.7	0.7	0.0	15.4	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.0	1.7	2.0	1.0	0.0	0.6	9.5	0.0	2.6	6.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.9	44.1	49.9	52.0	38.2	0.0	47.3	15.2	0.0	58.2	10.6	0.0
LnGrp LOS	D	D	D	D	D		D	B		E	B	
Approach Vol, veh/h		134			328	A		2681	A		2388	A
Approach Delay, s/veh		47.7			47.9			15.8			14.2	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.1	59.8	11.9	10.9	8.1	63.8	7.0	15.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.6	58.9	7.5	18.0	6.3	60.2	5.0	20.5
Max Q Clear Time (g_c+I1), s	7.8	31.9	7.4	6.1	3.6	22.1	2.9	4.5
Green Ext Time (p_c), s	0.0	23.4	0.0	0.4	0.0	26.2	0.0	0.4

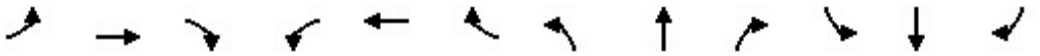
Intersection Summary	
HCM 6th Ctrl Delay	17.8
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.939			0.951						0.998	
Flt Protected	0.950	0.971			0.969		0.950			0.950		
Satd. Flow (prot)	1593	1529	0	0	1626	0	1676	4818	0	1676	4808	0
Flt Permitted	0.950	0.971					0.950			0.950		
Satd. Flow (perm)	1593	1529	0	0	1678	0	1676	4818	0	1676	4808	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		95			95						3	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



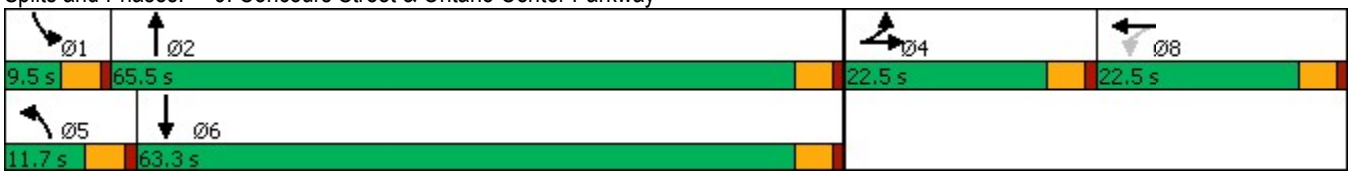
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	49	0	12	15	0	9	4	1803	5	1	1088	17
Future Volume (vph)	49	0	12	15	0	9	4	1803	5	1	1088	17
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	52	0	13	16	0	9	4	1898	5	1	1145	18
Shared Lane Traffic (%)	36%											
Lane Group Flow (vph)	33	32	0	0	25	0	4	1903	0	1	1163	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	49	0	15	0	4	1803	1	1088
Future Volume (vph)	49	0	15	0	4	1803	1	1088
Turn Type	Split	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	4	4		8	5	2	1	6
Permitted Phases			8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	11.7	65.5	9.5	63.3
Total Split (%)	18.8%	18.8%	18.8%	18.8%	9.8%	54.6%	7.9%	52.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	7.6	7.6		6.0	6.2	57.1	5.4	56.9
Actuated g/C Ratio	0.10	0.10		0.08	0.08	0.77	0.07	0.77
v/c Ratio	0.20	0.13		0.11	0.03	0.51	0.01	0.32
Control Delay	40.3	1.1		1.0	40.8	6.6	42.0	5.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	40.3	1.1		1.0	40.8	6.6	42.0	5.3
LOS	D	A		A	D	A	D	A
Approach Delay		21.0		1.0		6.7		5.3
Approach LOS		C		A		A		A

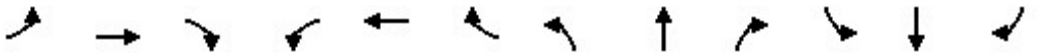
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 74.2	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 6.4	Intersection LOS: A
Intersection Capacity Utilization 52.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	33	32	25	4	1903	1	1163
v/c Ratio	0.20	0.13	0.11	0.03	0.51	0.01	0.32
Control Delay	40.3	1.1	1.0	40.8	6.6	42.0	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.3	1.1	1.0	40.8	6.6	42.0	5.3
Queue Length 50th (ft)	16	0	0	2	83	1	40
Queue Length 95th (ft)	52	0	0	13	307	6	161
Internal Link Dist (ft)		319	68		111		176
Turn Bay Length (ft)	170			115		120	
Base Capacity (vph)	419	472	511	176	3924	122	3844
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.07	0.05	0.02	0.48	0.01	0.30

Intersection Summary



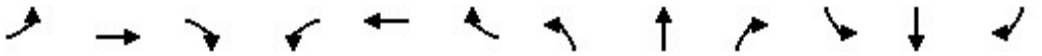
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	0	12	15	0	9	4	1803	5	1	1088	17
Future Volume (veh/h)	49	0	12	15	0	9	4	1803	5	1	1088	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	32	27	13	16	0	9	4	1898	5	1	1145	18
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	97	65	31	29	0	16	9	3101	8	3	3035	48
Arrive On Green	0.06	0.06	0.06	0.03	0.00	0.03	0.01	0.62	0.62	0.00	0.62	0.62
Sat Flow, veh/h	1688	1130	544	1034	0	582	1688	4981	13	1688	4906	77
Grp Volume(v), veh/h	32	0	40	25	0	0	4	1229	674	1	753	410
Grp Sat Flow(s),veh/h/ln	1688	0	1674	1616	0	0	1688	1612	1770	1688	1612	1758
Q Serve(g_s), s	1.1	0.0	1.4	0.9	0.0	0.0	0.1	14.4	14.4	0.0	7.2	7.2
Cycle Q Clear(g_c), s	1.1	0.0	1.4	0.9	0.0	0.0	0.1	14.4	14.4	0.0	7.2	7.2
Prop In Lane	1.00		0.32	0.64		0.36	1.00		0.01	1.00		0.04
Lane Grp Cap(c), veh/h	97	0	96	46	0	0	9	2008	1102	3	1995	1087
V/C Ratio(X)	0.33	0.00	0.42	0.55	0.00	0.00	0.44	0.61	0.61	0.37	0.38	0.38
Avail Cap(c_a), veh/h	490	0	486	469	0	0	196	3175	1742	136	3061	1668
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.1	0.0	28.2	29.7	0.0	0.0	30.7	7.1	7.1	30.9	5.9	5.9
Incr Delay (d2), s/veh	2.0	0.0	2.9	9.9	0.0	0.0	30.3	0.3	0.6	67.0	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.6	0.5	0.0	0.0	0.1	3.7	4.1	0.1	1.8	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.0	0.0	31.1	39.6	0.0	0.0	61.0	7.4	7.7	98.0	6.0	6.1
LnGrp LOS	C	A	C	D	A	A	E	A	A	F	A	A
Approach Vol, veh/h		72			25			1907			1164	
Approach Delay, s/veh		30.6			39.6			7.6			6.1	
Approach LOS		C			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	43.1		8.1	4.8	42.8		6.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	61.0		18.0	7.2	58.8		18.0				
Max Q Clear Time (g_c+I1), s	2.0	16.4		3.4	2.1	9.2		2.9				
Green Ext Time (p_c), s	0.0	22.2		0.2	0.0	10.5		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	7.8
HCM 6th LOS	A

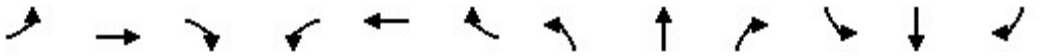
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			193			193			193			193
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



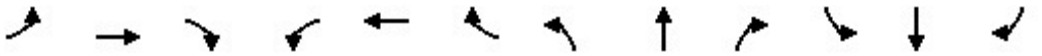
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	339	133	148	185	69	168	190	1880	141	214	1386	129
Future Volume (vph)	339	133	148	185	69	168	190	1880	141	214	1386	129
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	353	139	154	193	72	175	198	1958	147	223	1444	134
Shared Lane Traffic (%)												
Lane Group Flow (vph)	353	139	154	193	72	175	198	1958	147	223	1444	134

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	339	133	148	185	69	168	190	1880	141	214	1386	129
Future Volume (vph)	339	133	148	185	69	168	190	1880	141	214	1386	129
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	24.1	26.7		19.9	22.5		19.8	48.4		15.0	43.6	
Total Split (%)	21.9%	24.3%		18.1%	20.5%		18.0%	44.0%		13.6%	39.6%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	18.1	11.6	94.4	11.6	7.5	94.4	11.8	42.7	94.4	10.3	41.3	94.4
Actuated g/C Ratio	0.19	0.12	1.00	0.12	0.08	1.00	0.12	0.45	1.00	0.11	0.44	1.00
v/c Ratio	0.64	0.34	0.10	0.54	0.27	0.12	0.55	0.71	0.10	0.71	0.54	0.09
Control Delay	42.3	41.1	0.1	45.6	45.3	0.2	45.7	23.2	0.1	55.3	21.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.3	41.1	0.1	45.6	45.3	0.2	45.7	23.2	0.1	55.3	21.5	0.1
LOS	D	D	A	D	D	A	D	C	A	E	C	A
Approach Delay		32.0			27.5			23.7			24.1	
Approach LOS		C			C			C			C	

Intersection Summary			
Cycle Length: 110			
Actuated Cycle Length: 94.4			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 25.2		Intersection LOS: C	
Intersection Capacity Utilization 66.7%		ICU Level of Service C	
Analysis Period (min) 15			

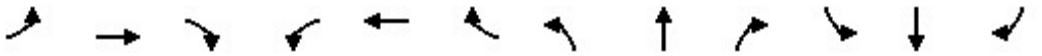
Splits and Phases: 10: Milliken Avenue & Concours Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	353	139	154	193	72	175	198	1958	147	223	1444	134
v/c Ratio	0.64	0.34	0.10	0.54	0.27	0.12	0.55	0.71	0.10	0.71	0.54	0.09
Control Delay	42.3	41.1	0.1	45.6	45.3	0.2	45.7	23.2	0.1	55.3	21.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.3	41.1	0.1	45.6	45.3	0.2	45.7	23.2	0.1	55.3	21.5	0.1
Queue Length 50th (ft)	106	41	0	58	22	0	60	273	0	69	184	0
Queue Length 95th (ft)	157	73	0	94	45	0	96	346	0	#127	254	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	605	794	1500	475	644	1500	472	2845	1500	324	2662	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.18	0.10	0.41	0.11	0.12	0.42	0.69	0.10	0.69	0.54	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



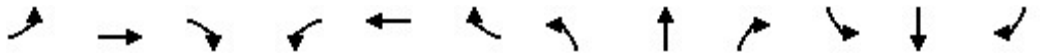
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	339	133	148	185	69	168	190	1880	141	214	1386	129
Future Volume (veh/h)	339	133	148	185	69	168	190	1880	141	214	1386	129
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	353	139	0	193	72	0	198	1958	0	223	1444	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	441	406		269	207		274	2834		293	2874	
Arrive On Green	0.15	0.12	0.00	0.09	0.06	0.00	0.09	0.46	0.00	0.10	0.47	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	353	139	0	193	72	0	198	1958	0	223	1444	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	9.5	3.1	0.0	5.2	1.7	0.0	5.4	20.6	0.0	6.1	13.4	0.0
Cycle Q Clear(g_c), s	9.5	3.1	0.0	5.2	1.7	0.0	5.4	20.6	0.0	6.1	13.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	441	406		269	207		274	2834		293	2874	
V/C Ratio(X)	0.80	0.34		0.72	0.35		0.72	0.69		0.76	0.50	
Avail Cap(c_a), veh/h	701	919		551	745		547	3289		376	2929	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.3	32.8	0.0	35.9	36.6	0.0	35.8	17.2	0.0	35.6	14.9	0.0
Incr Delay (d2), s/veh	3.5	0.5	0.0	3.6	1.0	0.0	3.6	0.5	0.0	6.7	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	1.3	0.0	2.0	0.7	0.0	2.0	6.8	0.0	2.4	4.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.8	33.3	0.0	39.5	37.6	0.0	39.4	17.7	0.0	42.3	15.0	0.0
LnGrp LOS	D	C		D	D		D	B		D	B	
Approach Vol, veh/h		492	A		265	A		2156	A		1667	A
Approach Delay, s/veh		35.8			39.0			19.7			18.7	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	42.3	12.0	14.3	12.2	42.9	16.8	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	43.9	15.4	22.2	15.3	39.1	19.6	18.0
Max Q Clear Time (g_c+I1), s	8.1	22.6	7.2	5.1	7.4	15.4	11.5	3.7
Green Ext Time (p_c), s	0.2	15.2	0.4	0.7	0.4	11.9	0.8	0.2

Intersection Summary	
HCM 6th Ctrl Delay	22.2
HCM 6th LOS	C

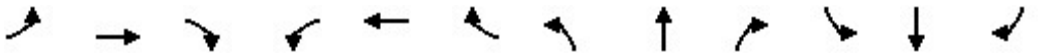
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55			177			223			177
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



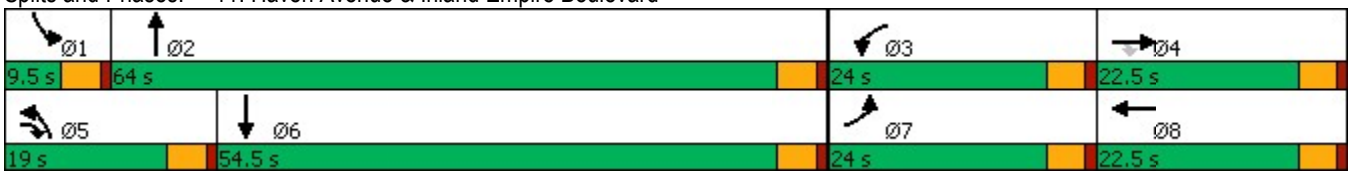
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	278	241	538	638	181	41	414	2056	435	42	2409	151
Future Volume (vph)	278	241	538	638	181	41	414	2056	435	42	2409	151
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	299	259	578	686	195	44	445	2211	468	45	2590	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	299	259	578	686	195	44	445	2211	468	45	2590	162

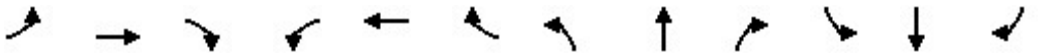
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	278	241	538	638	181	41	414	2056	435	42	2409	151
Future Volume (vph)	278	241	538	638	181	41	414	2056	435	42	2409	151
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	24.0	22.5	19.0	24.0	22.5		19.0	64.0		9.5	54.5	
Total Split (%)	20.0%	18.8%	15.8%	20.0%	18.8%		15.8%	53.3%		7.9%	45.4%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	16.6	14.1	33.1	19.5	17.1	116.2	14.5	61.5	116.2	5.0	50.0	116.2
Actuated g/C Ratio	0.14	0.12	0.28	0.17	0.15	1.00	0.12	0.53	1.00	0.04	0.43	1.00
v/c Ratio	0.73	0.64	1.24	1.04	0.40	0.03	1.23	0.69	0.31	0.36	0.99	0.11
Control Delay	58.4	56.0	158.1	92.3	48.1	0.0	169.8	22.4	0.5	63.5	48.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.4	56.0	158.1	92.3	48.1	0.0	169.8	22.4	0.5	63.5	48.8	0.1
LOS	E	E	F	F	D	A	F	C	A	E	D	A
Approach Delay		108.6			78.6			40.1			46.2	
Approach LOS		F			E			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 116.2	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.24	
Intersection Signal Delay: 56.5	Intersection LOS: E
Intersection Capacity Utilization 98.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard



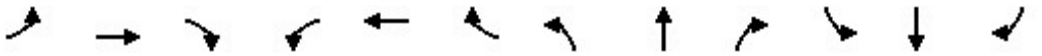


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	299	259	578	686	195	44	445	2211	468	45	2590	162
v/c Ratio	0.73	0.64	1.24	1.04	0.40	0.03	1.23	0.69	0.31	0.36	0.99	0.11
Control Delay	58.4	56.0	158.1	92.3	48.1	0.0	169.8	22.4	0.5	63.5	48.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.4	56.0	158.1	92.3	48.1	0.0	169.8	22.4	0.5	63.5	48.8	0.1
Queue Length 50th (ft)	111	98	~508	~196	71	0	~212	356	0	17	549	0
Queue Length 95th (ft)	161	143	#725	#291	111	0	#329	428	0	38	#693	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	485	519	466	661	519	1500	361	3214	1500	124	2614	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.50	1.24	1.04	0.38	0.03	1.23	0.69	0.31	0.36	0.99	0.11

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



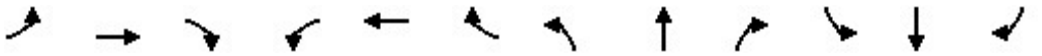
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	278	241	538	638	181	41	414	2056	435	42	2409	151
Future Volume (veh/h)	278	241	538	638	181	41	414	2056	435	42	2409	151
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	299	259	578	686	195	0	445	2211	0	45	2590	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	353	505	407	644	643		352	3079		94	2540	
Arrive On Green	0.12	0.15	0.15	0.16	0.19	0.00	0.12	0.51	0.00	0.03	0.42	0.00
Sat Flow, veh/h	2910	3367	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	299	259	578	686	195	0	445	2211	0	45	2590	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	12.1	8.5	18.0	19.5	6.0	0.0	14.5	33.8	0.0	1.8	50.0	0.0
Cycle Q Clear(g_c), s	12.1	8.5	18.0	19.5	6.0	0.0	14.5	33.8	0.0	1.8	50.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	353	505	407	644	643		352	3079		94	2540	
V/C Ratio(X)	0.85	0.51	1.42	1.06	0.30		1.27	0.72		0.48	1.02	
Avail Cap(c_a), veh/h	473	505	407	644	643		352	3079		121	2540	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	51.6	47.0	43.8	50.2	41.7	0.0	52.8	23.1	0.0	57.1	35.0	0.0
Incr Delay (d2), s/veh	10.3	0.9	203.5	53.9	0.3	0.0	140.3	0.8	0.0	3.7	23.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	3.6	34.9	9.6	2.5	0.0	12.1	12.0	0.0	0.7	22.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.9	47.8	247.2	104.1	41.9	0.0	193.0	23.9	0.0	60.8	58.0	0.0
LnGrp LOS	E	D	F	F	D		F	C		E	F	
Approach Vol, veh/h		1136			881	A		2656	A		2635	A
Approach Delay, s/veh		153.0			90.4			52.2			58.1	
Approach LOS		F			F			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	65.1	24.0	22.5	19.0	54.5	19.1	27.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	59.5	19.5	18.0	14.5	50.0	19.5	18.0
Max Q Clear Time (g_c+I1), s	3.8	35.8	21.5	20.0	16.5	52.0	14.1	8.0
Green Ext Time (p_c), s	0.0	18.4	0.0	0.0	0.0	0.0	0.5	0.8

Intersection Summary	
HCM 6th Ctrl Delay	74.6
HCM 6th LOS	E

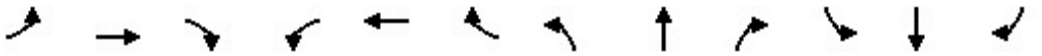
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			340			177			177			177
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



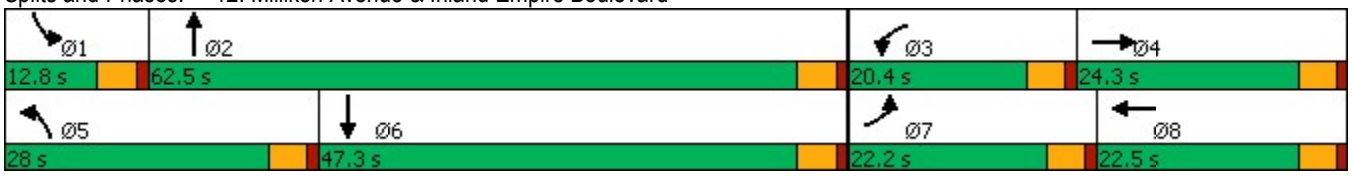
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	305	298	323	212	90	137	391	1755	365	127	1523	131
Future Volume (vph)	305	298	323	212	90	137	391	1755	365	127	1523	131
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	321	314	340	223	95	144	412	1847	384	134	1603	138
Shared Lane Traffic (%)												
Lane Group Flow (vph)	321	314	340	223	95	144	412	1847	384	134	1603	138

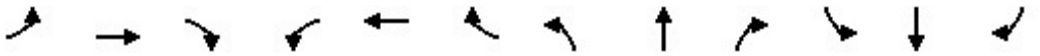
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	298	323	212	90	137	391	1755	365	127	1523	131
Future Volume (vph)	305	298	323	212	90	137	391	1755	365	127	1523	131
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	22.2	24.3		20.4	22.5		28.0	62.5		12.8	47.3	
Total Split (%)	18.5%	20.3%		17.0%	18.8%		23.3%	52.1%		10.7%	39.4%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	19.2	15.3	106.3	13.2	12.1	106.3	19.7	51.2	106.3	8.2	39.7	106.3
Actuated g/C Ratio	0.18	0.14	1.00	0.12	0.11	1.00	0.19	0.48	1.00	0.08	0.37	1.00
v/c Ratio	0.62	0.65	0.23	0.62	0.25	0.10	0.77	0.63	0.26	0.60	0.71	0.09
Control Delay	49.7	51.2	0.3	54.2	46.3	0.1	52.8	21.9	0.4	62.9	31.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.7	51.2	0.3	54.2	46.3	0.1	52.8	21.9	0.4	62.9	31.3	0.1
LOS	D	D	A	D	D	A	D	C	A	E	C	A
Approach Delay		33.0			35.7			23.6			31.2	
Approach LOS		C			D			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 106.3	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 28.5	Intersection LOS: C
Intersection Capacity Utilization 67.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	321	314	340	223	95	144	412	1847	384	134	1603	138
v/c Ratio	0.62	0.65	0.23	0.62	0.25	0.10	0.77	0.63	0.26	0.60	0.71	0.09
Control Delay	49.7	51.2	0.3	54.2	46.3	0.1	52.8	21.9	0.4	62.9	31.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.7	51.2	0.3	54.2	46.3	0.1	52.8	21.9	0.4	62.9	31.3	0.1
Queue Length 50th (ft)	113	113	0	79	33	0	145	267	0	48	275	0
Queue Length 95th (ft)	#183	168	0	127	61	0	213	340	0	#94	359	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	535	637	1500	441	579	1500	652	3381	1500	230	2495	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.49	0.23	0.51	0.16	0.10	0.63	0.55	0.26	0.58	0.64	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	305	298	323	212	90	137	391	1755	365	127	1523	131
Future Volume (veh/h)	305	298	323	212	90	137	391	1755	365	127	1523	131
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	321	314	0	223	95	0	412	1847	0	134	1603	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	399	433		297	315		501	3014		193	2369	
Arrive On Green	0.14	0.13	0.00	0.10	0.09	0.00	0.17	0.49	0.00	0.07	0.39	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	321	314	0	223	95	0	412	1847	0	134	1603	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	9.2	7.7	0.0	6.4	2.3	0.0	11.8	19.0	0.0	3.9	18.8	0.0
Cycle Q Clear(g_c), s	9.2	7.7	0.0	6.4	2.3	0.0	11.8	19.0	0.0	3.9	18.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	399	433		297	315		501	3014		193	2369	
V/C Ratio(X)	0.80	0.73		0.75	0.30		0.82	0.61		0.69	0.68	
Avail Cap(c_a), veh/h	596	772		536	701		792	4092		280	3020	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	36.1	36.2	0.0	37.7	36.5	0.0	34.5	15.8	0.0	39.5	21.9	0.0
Incr Delay (d2), s/veh	4.8	2.3	0.0	3.8	0.5	0.0	3.9	0.2	0.0	4.4	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	3.3	0.0	2.4	0.9	0.0	4.3	6.2	0.0	1.5	6.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.0	38.5	0.0	41.5	37.1	0.0	38.4	16.0	0.0	43.9	22.3	0.0
LnGrp LOS	D	D		D	D		D	B		D	C	
Approach Vol, veh/h		635	A		318	A		2259	A		1737	A
Approach Delay, s/veh		39.7			40.2			20.1			24.0	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	47.2	13.3	15.6	19.4	38.1	16.4	12.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.3	58.0	15.9	19.8	23.5	42.8	17.7	18.0
Max Q Clear Time (g_c+I1), s	5.9	21.0	8.4	9.7	13.8	20.8	11.2	4.3
Green Ext Time (p_c), s	0.1	20.5	0.4	1.4	1.1	12.7	0.6	0.4

Intersection Summary	
HCM 6th Ctrl Delay	25.3
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.982	0.850				
Flt Protected	0.958					
Satd. Flow (prot)	3042	1365	6071	0	0	6071
Flt Permitted	0.958					
Satd. Flow (perm)	3042	1365	6071	0	0	6071
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	2	2				
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	502	328	2439	0	0	2428
Future Volume (vph)	502	328	2439	0	0	2428
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	523	342	2541	0	0	2529
Shared Lane Traffic (%)		21%				
Lane Group Flow (vph)	595	270	2541	0	0	2529

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	502	328	2439	2428
Future Volume (vph)	502	328	2439	2428
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	41.0	41.0
Total Split (%)	36.9%	36.9%	63.1%	63.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	16.8	16.8	36.6	36.6
Actuated g/C Ratio	0.27	0.27	0.59	0.59
v/c Ratio	0.73	0.74	0.71	0.71
Control Delay	26.3	33.7	11.0	11.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	26.3	33.7	11.0	11.0
LOS	C	C	B	B
Approach Delay	28.6		11.0	11.0
Approach LOS	C		B	B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 62.4	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 13.6	Intersection LOS: B
Intersection Capacity Utilization 69.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	595	270	2541	2529
v/c Ratio	0.73	0.74	0.71	0.71
Control Delay	26.3	33.7	11.0	11.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	26.3	33.7	11.0	11.0
Queue Length 50th (ft)	104	101	190	188
Queue Length 95th (ft)	154	#194	243	241
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	955	429	3562	3562
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.62	0.63	0.71	0.71

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

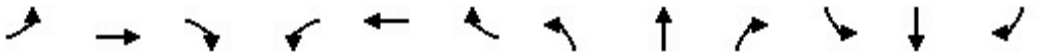
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	502	328	2439	0	0	2428
Future Volume (veh/h)	502	328	2439	0	0	2428
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1673	1772	1772	0	0	1772
Adj Flow Rate, veh/h	573	288	2541	0	0	2529
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	793	373	3633	0	0	3633
Arrive On Green	0.25	0.25	0.60	0.00	0.00	0.60
Sat Flow, veh/h	3188	1502	6592	0	0	6592
Grp Volume(v), veh/h	573	288	2541	0	0	2529
Grp Sat Flow(s),veh/h/ln	1594	1502	1524	0	0	1524
Q Serve(g_s), s	9.5	10.3	16.7	0.0	0.0	16.6
Cycle Q Clear(g_c), s	9.5	10.3	16.7	0.0	0.0	16.6
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	793	373	3633	0	0	3633
V/C Ratio(X)	0.72	0.77	0.70	0.00	0.00	0.70
Avail Cap(c_a), veh/h	1073	506	3841	0	0	3841
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	19.9	20.2	8.1	0.0	0.0	8.1
Incr Delay (d2), s/veh	1.6	5.0	0.5	0.0	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	3.8	4.1	0.0	0.0	4.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.5	25.3	8.6	0.0	0.0	8.6
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	861		2541			2529
Approach Delay, s/veh	22.8		8.6			8.6
Approach LOS	C		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		39.0			39.0	18.9
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		36.5			36.5	19.5
Max Q Clear Time (g_c+I1), s		18.7			18.6	12.3
Green Ext Time (p_c), s		15.8			15.9	2.1

Intersection Summary	
HCM 6th Ctrl Delay	10.7
HCM 6th LOS	B

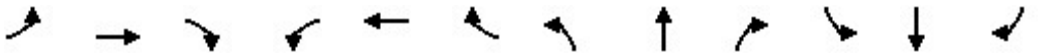
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			146			136			281			55
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



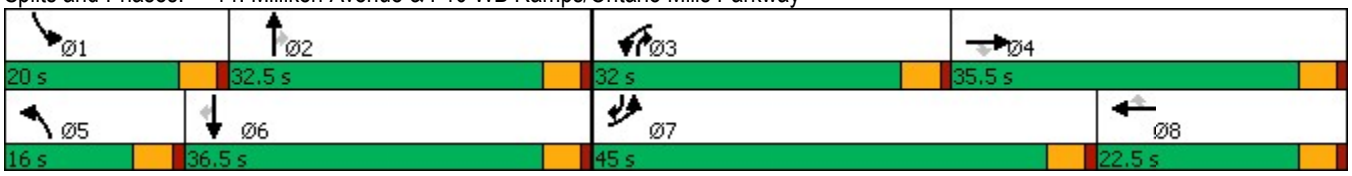
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	933	197	237	253	301	63	240	1027	453	332	1191	479
Future Volume (vph)	933	197	237	253	301	63	240	1027	453	332	1191	479
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	972	205	247	264	314	66	250	1070	472	346	1241	499
Shared Lane Traffic (%)												
Lane Group Flow (vph)	972	205	247	264	314	66	250	1070	472	346	1241	499

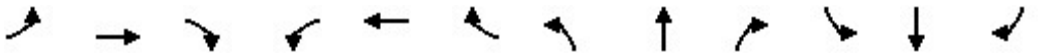
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	933	197	237	253	301	63	240	1027	453	332	1191	479
Future Volume (vph)	933	197	237	253	301	63	240	1027	453	332	1191	479
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	45.0	35.5	35.5	32.0	22.5	22.5	16.0	32.5	32.0	20.0	36.5	45.0
Total Split (%)	37.5%	29.6%	29.6%	26.7%	18.8%	18.8%	13.3%	27.1%	26.7%	16.7%	30.4%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	40.6	39.5	39.5	16.6	15.5	15.5	11.5	26.8	47.9	15.5	30.8	75.8
Actuated g/C Ratio	0.35	0.34	0.34	0.14	0.13	0.13	0.10	0.23	0.41	0.13	0.26	0.65
v/c Ratio	0.97	0.34	0.41	0.64	0.70	0.21	0.87	0.77	0.60	0.90	0.77	0.50
Control Delay	59.3	32.2	15.1	54.3	57.5	1.5	81.8	46.3	13.2	77.0	43.6	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.3	32.2	15.1	54.3	57.5	1.5	81.8	46.3	13.2	77.0	43.6	11.5
LOS	E	C	B	D	E	A	F	D	B	E	D	B
Approach Delay		47.8			50.4			42.5			41.5	
Approach LOS		D			D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 116.4	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 44.3	Intersection LOS: D
Intersection Capacity Utilization 82.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway

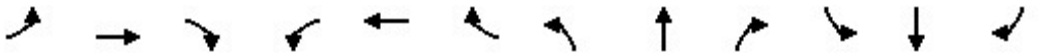




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	972	205	247	264	314	66	250	1070	472	346	1241	499
v/c Ratio	0.97	0.34	0.41	0.64	0.70	0.21	0.87	0.77	0.60	0.90	0.77	0.50
Control Delay	59.3	32.2	15.1	54.3	57.5	1.5	81.8	46.3	13.2	77.0	43.6	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.3	32.2	15.1	54.3	57.5	1.5	81.8	46.3	13.2	77.0	43.6	11.5
Queue Length 50th (ft)	375	117	55	98	121	0	98	220	104	136	252	159
Queue Length 95th (ft)	#531	197	137	138	171	0	#178	267	199	#229	301	251
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	1007	598	605	683	519	347	286	1462	896	385	1671	996
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.34	0.41	0.39	0.61	0.19	0.87	0.73	0.53	0.90	0.74	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	933	197	237	253	301	63	240	1027	453	332	1191	479
Future Volume (veh/h)	933	197	237	253	301	63	240	1027	453	332	1191	479
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	972	205	247	264	314	66	250	1070	472	346	1241	499
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1013	625	530	328	395	176	291	1485	535	391	1694	940
Arrive On Green	0.35	0.35	0.35	0.11	0.12	0.12	0.10	0.24	0.24	0.13	0.28	0.28
Sat Flow, veh/h	2910	1772	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	972	205	247	264	314	66	250	1070	472	346	1241	499
Grp Sat Flow(s),veh/h/ln	1455	1772	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	37.6	9.7	14.6	10.2	10.4	4.7	9.7	18.5	28.0	13.4	21.2	21.4
Cycle Q Clear(g_c), s	37.6	9.7	14.6	10.2	10.4	4.7	9.7	18.5	28.0	13.4	21.2	21.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1013	625	530	328	395	176	291	1485	535	391	1694	940
V/C Ratio(X)	0.96	0.33	0.47	0.80	0.80	0.37	0.86	0.72	0.88	0.89	0.73	0.53
Avail Cap(c_a), veh/h	1025	625	530	696	527	235	291	1485	535	392	1697	941
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.7	27.2	28.8	49.8	49.4	46.8	50.9	39.9	34.7	48.9	37.6	12.0
Incr Delay (d2), s/veh	18.9	0.3	0.6	4.6	6.1	1.3	21.8	1.7	15.8	20.7	1.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.7	4.2	5.3	3.9	4.7	1.8	4.4	7.1	14.5	6.0	8.1	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.6	27.5	29.5	54.4	55.5	48.2	72.7	41.6	50.6	69.6	39.3	12.6
LnGrp LOS	E	C	C	D	E	D	E	D	D	E	D	B
Approach Vol, veh/h		1424			644			1792			2086	
Approach Delay, s/veh		47.0			54.3			48.3			37.9	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.9	32.5	17.5	45.1	16.0	36.4	44.5	18.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	28.0	27.5	31.0	11.5	32.0	40.5	18.0
Max Q Clear Time (g_c+I1), s	15.4	30.0	12.2	16.6	11.7	23.4	39.6	12.4
Green Ext Time (p_c), s	0.0	0.0	0.8	1.8	0.0	6.1	0.4	1.0

Intersection Summary	
HCM 6th Ctrl Delay	45.0
HCM 6th LOS	D

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.994	0.850				
Flt Protected	0.954					
Satd. Flow (prot)	3066	1365	0	6071	6071	0
Flt Permitted	0.954					
Satd. Flow (perm)	3066	1365	0	6071	6071	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	5	10				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

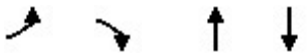
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	610	251	0	2574	2020	0
Future Volume (vph)	610	251	0	2574	2020	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	635	261	0	2681	2104	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	661	235	0	2681	2104	0

Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	610	251	2574	2020
Future Volume (vph)	610	251	2574	2020
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	54.0	54.0
Total Split (%)	32.5%	32.5%	67.5%	67.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	20.2	20.2	49.5	49.5
Actuated g/C Ratio	0.26	0.26	0.63	0.63
v/c Ratio	0.84	0.66	0.70	0.55
Control Delay	38.4	34.8	11.2	9.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	38.4	34.8	11.2	9.2
LOS	D	C	B	A
Approach Delay	37.4		11.2	9.2
Approach LOS	D		B	A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 78.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 14.6	Intersection LOS: B
Intersection Capacity Utilization 69.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps



Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	661	235	2681	2104
v/c Ratio	0.84	0.66	0.70	0.55
Control Delay	38.4	34.8	11.2	9.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	38.4	34.8	11.2	9.2
Queue Length 50th (ft)	157	108	237	159
Queue Length 95th (ft)	#237	192	279	189
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	841	380	3819	3819
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.79	0.62	0.70	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	610	251	0	2574	2020	0
Future Volume (veh/h)	610	251	0	2574	2020	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1772	0	1772	1772	0
Adj Flow Rate, veh/h	635	261	0	2681	2104	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	771	363	0	3869	3869	0
Arrive On Green	0.24	0.24	0.00	0.63	0.63	0.00
Sat Flow, veh/h	3188	1502	0	6592	6592	0
Grp Volume(v), veh/h	635	261	0	2681	2104	0
Grp Sat Flow(s),veh/h/ln	1594	1502	0	1524	1524	0
Q Serve(g_s), s	13.8	11.6	0.0	20.9	14.0	0.0
Cycle Q Clear(g_c), s	13.8	11.6	0.0	20.9	14.0	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	771	363	0	3869	3869	0
V/C Ratio(X)	0.82	0.72	0.00	0.69	0.54	0.00
Avail Cap(c_a), veh/h	940	443	0	4137	4137	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.2	25.4	0.0	8.7	7.4	0.0
Incr Delay (d2), s/veh	5.0	4.4	0.0	0.5	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	4.4	0.0	5.5	3.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	31.2	29.7	0.0	9.2	7.6	0.0
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	896			2681	2104	
Approach Delay, s/veh	30.8			9.2	7.6	
Approach LOS	C			A	A	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	50.8	22.1	50.8
Change Period (Y+Rc), s	4.5	4.5	4.5
Max Green Setting (Gmax), s	49.5	21.5	49.5
Max Q Clear Time (g_c+I1), s	22.9	15.8	16.0
Green Ext Time (p_c), s	23.4	1.9	22.7

Intersection Summary	
HCM 6th Ctrl Delay	12.0
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1600	1800	1600	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2891	1500	2891	6071	6071	1500
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2891	1500	2891	6071	6071	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		9				83
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	513	202	326	1213	1024	674
Future Volume (vph)	513	202	326	1213	1024	674
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	529	208	336	1251	1056	695
Shared Lane Traffic (%)						
Lane Group Flow (vph)	529	208	336	1251	1056	695

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	513	202	326	1213	1024	674
Future Volume (vph)	513	202	326	1213	1024	674
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	22.5	14.9	14.9	37.5	22.6	22.5
Total Split (%)	37.5%	24.8%	24.8%	62.5%	37.7%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	15.9	30.3	9.9	31.1	16.7	37.1
Actuated g/C Ratio	0.28	0.54	0.18	0.55	0.30	0.66
v/c Ratio	0.65	0.26	0.66	0.37	0.59	0.68
Control Delay	22.2	7.8	29.8	7.6	18.6	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.2	7.8	29.8	7.6	18.6	9.2
LOS	C	A	C	A	B	A
Approach Delay	18.1			12.3	14.9	
Approach LOS	B			B	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 14.5	Intersection LOS: B
Intersection Capacity Utilization 62.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	529	208	336	1251	1056	695
v/c Ratio	0.65	0.26	0.66	0.37	0.59	0.68
Control Delay	22.2	7.8	29.8	7.6	18.6	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.2	7.8	29.8	7.6	18.6	9.2
Queue Length 50th (ft)	83	34	59	67	92	100
Queue Length 95th (ft)	128	66	#100	87	122	198
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	939	831	542	3615	1983	1078
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.25	0.62	0.35	0.53	0.64

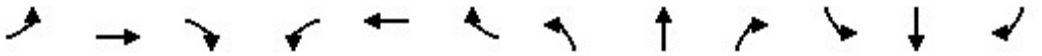
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	513	202	326	1213	1024	674
Future Volume (veh/h)	513	202	326	1213	1024	674
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1772	1575	1772	1772	1772
Adj Flow Rate, veh/h	529	208	336	1251	1056	695
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	700	592	448	3577	2114	882
Arrive On Green	0.24	0.24	0.15	0.59	0.35	0.35
Sat Flow, veh/h	2910	1502	2910	6343	6343	1502
Grp Volume(v), veh/h	529	208	336	1251	1056	695
Grp Sat Flow(s),veh/h/ln	1455	1502	1455	1524	1524	1502
Q Serve(g_s), s	8.8	5.1	5.8	5.6	7.1	18.1
Cycle Q Clear(g_c), s	8.8	5.1	5.8	5.6	7.1	18.1
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	700	592	448	3577	2114	882
V/C Ratio(X)	0.76	0.35	0.75	0.35	0.50	0.79
Avail Cap(c_a), veh/h	1004	749	580	3854	2114	882
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.4	11.1	21.1	5.6	13.5	8.2
Incr Delay (d2), s/veh	2.0	0.4	4.0	0.1	0.2	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	4.9	2.0	1.2	2.1	9.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.4	11.5	25.1	5.7	13.7	13.0
LnGrp LOS	C	B	C	A	B	B
Approach Vol, veh/h	737			1587	1751	
Approach Delay, s/veh	17.9			9.8	13.4	
Approach LOS	B			A	B	

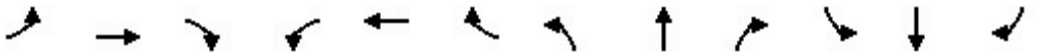
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		35.1		17.1	12.5	22.6
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		33.0		18.0	10.4	18.1
Max Q Clear Time (g_c+I1), s		7.6		10.8	7.8	20.1
Green Ext Time (p_c), s		10.4		1.8	0.3	0.0

Intersection Summary	
HCM 6th Ctrl Delay	12.8
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.954				0.850			0.850		0.992	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4596	0	2891	3353	1500	2891	4818	1500	2891	6022	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4596	0	2891	3353	1500	2891	4818	1500	2891	6022	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		104				217			279		12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



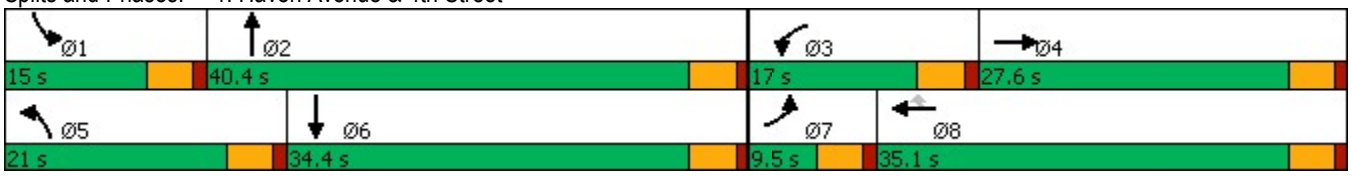
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	52	564	250	327	535	204	306	1424	481	210	1388	79
Future Volume (vph)	52	564	250	327	535	204	306	1424	481	210	1388	79
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	55	600	266	348	569	217	326	1515	512	223	1477	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	866	0	348	569	217	326	1515	512	223	1561	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	52	564	327	535	204	306	1424	481	210	1388
Future Volume (vph)	52	564	327	535	204	306	1424	481	210	1388
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	9.5	27.6	17.0	35.1	35.1	21.0	40.4		15.0	34.4
Total Split (%)	9.5%	27.6%	17.0%	35.1%	35.1%	21.0%	40.4%		15.0%	34.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	5.0	21.7	12.5	31.2	31.2	15.0	35.9	98.3	10.2	31.2
Actuated g/C Ratio	0.05	0.22	0.13	0.32	0.32	0.15	0.37	1.00	0.10	0.32
v/c Ratio	0.37	0.79	0.95	0.54	0.35	0.74	0.86	0.34	0.74	0.81
Control Delay	53.5	37.7	79.7	30.5	5.4	50.9	35.4	0.6	59.2	35.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	37.7	79.7	30.5	5.4	50.9	35.4	0.6	59.2	35.4
LOS	D	D	E	C	A	D	D	A	E	D
Approach Delay		38.7		40.8			30.0			38.4
Approach LOS		D		D			C			D

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 98.3	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 35.7	Intersection LOS: D
Intersection Capacity Utilization 79.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Haven Avenue & 4th Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	55	866	348	569	217	326	1515	512	223	1561
v/c Ratio	0.37	0.79	0.95	0.54	0.35	0.74	0.86	0.34	0.74	0.81
Control Delay	53.5	37.7	79.7	30.5	5.4	50.9	35.4	0.6	59.2	35.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	37.7	79.7	30.5	5.4	50.9	35.4	0.6	59.2	35.4
Queue Length 50th (ft)	18	167	115	158	0	102	327	0	72	270
Queue Length 95th (ft)	38	216	#205	214	52	149	391	0	#124	318
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	147	1159	367	1075	628	485	1759	1500	308	1917
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.75	0.95	0.53	0.35	0.67	0.86	0.34	0.72	0.81

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

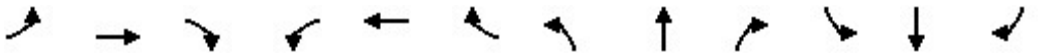
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	564	250	327	535	204	306	1424	481	210	1388	79
Future Volume (veh/h)	52	564	250	327	535	204	306	1424	481	210	1388	79
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	55	600	266	348	569	217	326	1515	0	223	1477	84
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	116	725	314	375	1037	463	391	1790		280	1974	112
Arrive On Green	0.04	0.22	0.22	0.13	0.31	0.31	0.13	0.37	0.00	0.10	0.33	0.33
Sat Flow, veh/h	2910	3307	1432	2910	3367	1502	2910	4837	1502	2910	5945	338
Grp Volume(v), veh/h	55	585	281	348	569	217	326	1515	0	223	1135	426
Grp Sat Flow(s),veh/h/ln	1455	1612	1514	1455	1683	1502	1455	1612	1502	1455	1524	1711
Q Serve(g_s), s	1.8	16.8	17.3	11.5	13.6	11.3	10.6	27.9	0.0	7.3	21.4	21.4
Cycle Q Clear(g_c), s	1.8	16.8	17.3	11.5	13.6	11.3	10.6	27.9	0.0	7.3	21.4	21.4
Prop In Lane	1.00		0.95	1.00		1.00	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	116	707	332	375	1037	463	391	1790		280	1518	568
V/C Ratio(X)	0.47	0.83	0.85	0.93	0.55	0.47	0.83	0.85		0.80	0.75	0.75
Avail Cap(c_a), veh/h	150	768	361	375	1062	474	495	1790		315	1518	568
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.6	36.1	36.3	41.8	27.9	27.1	40.9	28.0	0.0	42.9	28.8	28.8
Incr Delay (d2), s/veh	3.0	7.0	16.0	29.0	0.6	0.7	9.5	5.1	0.0	12.0	3.4	8.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	7.2	7.8	5.6	5.5	4.1	4.3	11.2	0.0	3.1	8.1	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.6	43.1	52.4	70.8	28.5	27.9	50.5	33.2	0.0	54.9	32.2	37.6
LnGrp LOS	D	D	D	E	C	C	D	C		D	C	D
Approach Vol, veh/h		921			1134			1841	A		1784	
Approach Delay, s/veh		46.3			41.4			36.2			36.3	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.8	40.4	17.0	25.8	17.5	36.7	8.4	34.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	35.9	12.5	23.1	16.5	29.9	5.0	30.6
Max Q Clear Time (g_c+I1), s	9.3	29.9	13.5	19.3	12.6	23.4	3.8	15.6
Green Ext Time (p_c), s	0.1	4.5	0.0	2.0	0.4	4.8	0.0	4.1

Intersection Summary	
HCM 6th Ctrl Delay	38.9
HCM 6th LOS	D

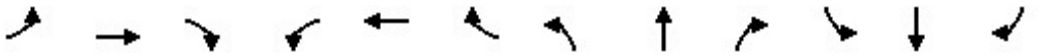
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt						0.850			0.850		0.850	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	1667	6071	0	1583	4818	1500	1667	1765	1500	1583	2850	0
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	1667	6071	0	1583	4818	1500	1667	1765	1500	1583	2850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				182			201		394	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



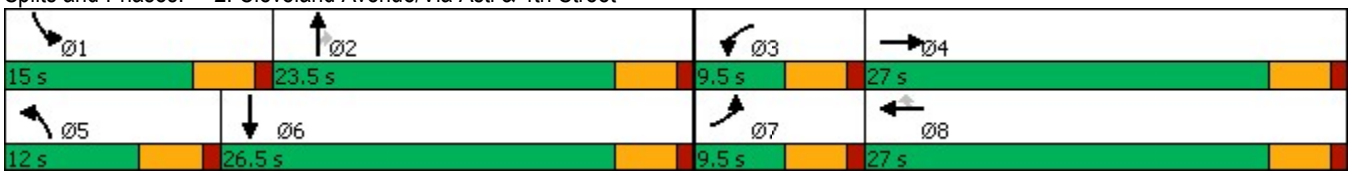
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	1337	4	3	1078	177	0	0	4	174	0	1
Future Volume (vph)	0	1337	4	3	1078	177	0	0	4	174	0	1
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1378	4	3	1111	182	0	0	4	179	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1382	0	3	1111	182	0	0	4	179	1	0

Intersection Summary

Lane Group	EBT	WBL	WBT	WBR	NBR	SBL	SBT	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	1337	3	1078	177	4	174	0		
Future Volume (vph)	1337	3	1078	177	4	174	0		
Turn Type	NA	Prot	NA	Perm	Perm	Prot	NA		
Protected Phases	4	3	8			1	6	5	7
Permitted Phases				8	2				
Detector Phase	4	3	8	8	2	1	6		
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	22.5	22.5	22.5	9.5	22.5	9.5	9.5
Total Split (s)	27.0	9.5	27.0	27.0	23.5	15.0	26.5	12.0	9.5
Total Split (%)	36.0%	12.7%	36.0%	36.0%	31.3%	20.0%	35.3%	16%	13%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		
Lead/Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	None	Min	None	None
Act Effct Green (s)	21.3	5.1	22.9	22.9	5.6	10.1	20.2		
Actuated g/C Ratio	0.41	0.10	0.44	0.44	0.11	0.19	0.39		
v/c Ratio	0.56	0.02	0.53	0.24	0.01	0.58	0.00		
Control Delay	13.3	24.3	11.5	2.5	0.0	30.5	0.0		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	13.3	24.3	11.5	2.5	0.0	30.5	0.0		
LOS	B	C	B	A	A	C	A		
Approach Delay	13.3		10.3				30.3		
Approach LOS	B		B				C		

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 52.2	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 13.0	Intersection LOS: B
Intersection Capacity Utilization 46.7%	ICU Level of Service A
Analysis Period (min) 15	

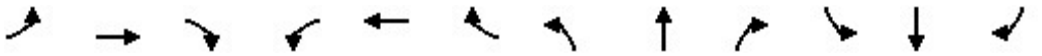
Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street



Lane Group	EBT	WBL	WBT	WBR	NBR	SBL	SBT
Lane Group Flow (vph)	1382	3	1111	182	4	179	1
v/c Ratio	0.56	0.02	0.53	0.24	0.01	0.58	0.00
Control Delay	13.3	24.3	11.5	2.5	0.0	30.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.3	24.3	11.5	2.5	0.0	30.5	0.0
Queue Length 50th (ft)	84	1	86	0	0	50	0
Queue Length 95th (ft)	152	8	115	24	0	#141	0
Internal Link Dist (ft)	2546		362				358
Turn Bay Length (ft)		130		145	165	50	
Base Capacity (vph)	2644	153	2246	796	678	321	1439
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.02	0.49	0.23	0.01	0.56	0.00

Intersection Summary

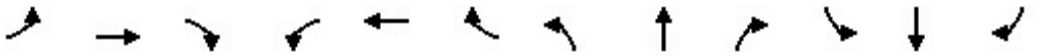
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1337	4	3	1078	177	0	0	4	174	0	1
Future Volume (veh/h)	0	1337	4	3	1078	177	0	0	4	174	0	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	0	1378	4	3	1111	182	0	0	4	179	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	3	2334	7	7	2266	704	3	188	159	222	574	512
Arrive On Green	0.00	0.37	0.37	0.00	0.47	0.47	0.00	0.00	0.11	0.14	0.00	0.34
Sat Flow, veh/h	1594	6322	18	1594	4837	1502	1594	1772	1502	1594	1683	1502
Grp Volume(v), veh/h	0	996	386	3	1111	182	0	0	4	179	0	1
Grp Sat Flow(s),veh/h/ln	1594	1524	1769	1594	1612	1502	1594	1772	1502	1594	1683	1502
Q Serve(g_s), s	0.0	8.3	8.3	0.1	7.5	3.5	0.0	0.0	0.1	5.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	8.3	8.3	0.1	7.5	3.5	0.0	0.0	0.1	5.1	0.0	0.0
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	3	1687	653	7	2266	704	3	188	159	222	574	512
V/C Ratio(X)	0.00	0.59	0.59	0.46	0.49	0.26	0.00	0.00	0.03	0.80	0.00	0.00
Avail Cap(c_a), veh/h	169	2179	843	169	2306	716	253	713	604	354	784	700
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.0	12.0	23.5	8.7	7.6	0.0	0.0	18.9	19.7	0.0	10.3
Incr Delay (d2), s/veh	0.0	0.3	0.9	43.3	0.2	0.2	0.0	0.0	0.1	6.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.3	2.8	0.1	2.0	0.9	0.0	0.0	0.0	2.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	12.3	12.9	66.7	8.8	7.8	0.0	0.0	19.0	26.6	0.0	10.3
LnGrp LOS	A	B	B	E	A	A	A	A	B	C	A	B
Approach Vol, veh/h		1382			1296			4			180	
Approach Delay, s/veh		12.5			8.8			19.0			26.5	
Approach LOS		B			A			B			C	

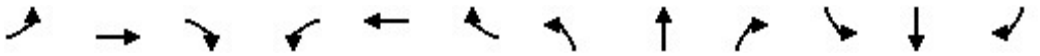
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.1	9.5	4.7	21.9	0.0	20.6	0.0	26.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	19.0	5.0	22.5	7.5	22.0	5.0	22.5
Max Q Clear Time (g_c+I1), s	7.1	2.1	2.1	10.3	0.0	2.0	0.0	9.5
Green Ext Time (p_c), s	0.1	0.0	0.0	7.1	0.0	0.0	0.0	6.8

Intersection Summary	
HCM 6th Ctrl Delay	11.7
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.994				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.953	
Satd. Flow (prot)	2891	6065	0	1583	4789	0	1583	1765	1500	0	1682	1500
Flt Permitted	0.950			0.950			0.725				0.731	
Satd. Flow (perm)	2891	6065	0	1583	4789	0	1208	1765	1500	0	1290	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			11				219			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



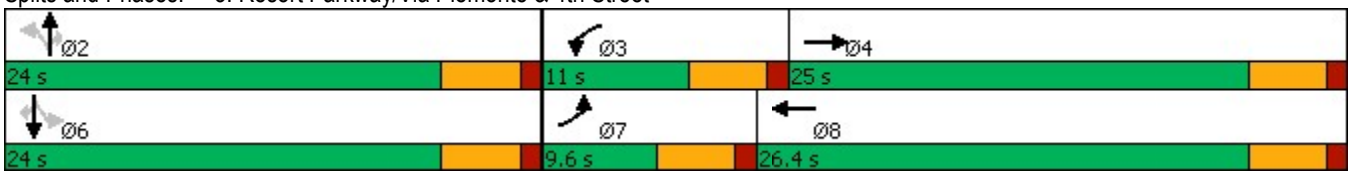
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	11	1488	8	5	1223	47	3	0	8	47	1	16
Future Volume (vph)	11	1488	8	5	1223	47	3	0	8	47	1	16
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	1534	8	5	1261	48	3	0	8	48	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	1542	0	5	1309	0	3	0	8	0	49	16

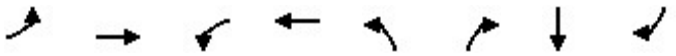
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	11	1488	5	1223	3	8	47	1	16
Future Volume (vph)	11	1488	5	1223	3	8	47	1	16
Turn Type	Prot	NA	Prot	NA	Perm	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8				6	
Permitted Phases					2	2	6		6
Detector Phase	7	4	3	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.6	25.0	11.0	26.4	24.0	24.0	24.0	24.0	24.0
Total Split (%)	16.0%	41.7%	18.3%	44.0%	40.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min
Act Effct Green (s)	5.2	20.3	5.8	20.4	7.0	7.0		7.0	7.0
Actuated g/C Ratio	0.14	0.53	0.15	0.54	0.18	0.18		0.18	0.18
v/c Ratio	0.03	0.48	0.02	0.51	0.01	0.02		0.21	0.04
Control Delay	17.8	7.0	17.2	7.2	15.0	0.1		17.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	17.8	7.0	17.2	7.2	15.0	0.1		17.4	0.2
LOS	B	A	B	A	B	A		B	A
Approach Delay		7.1		7.3				13.2	
Approach LOS		A		A				B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 38.1	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 7.3	Intersection LOS: A
Intersection Capacity Utilization 45.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street





Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBT	SBR
Lane Group Flow (vph)	11	1542	5	1309	3	8	49	16
v/c Ratio	0.03	0.48	0.02	0.51	0.01	0.02	0.21	0.04
Control Delay	17.8	7.0	17.2	7.2	15.0	0.1	17.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.8	7.0	17.2	7.2	15.0	0.1	17.4	0.2
Queue Length 50th (ft)	1	40	1	43	1	0	9	0
Queue Length 95th (ft)	7	127	9	137	6	0	35	0
Internal Link Dist (ft)		362		428			378	
Turn Bay Length (ft)	220		125		115	115		110
Base Capacity (vph)	397	3431	277	2830	634	892	677	840
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.45	0.02	0.46	0.00	0.01	0.07	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1488	8	5	1223	47	3	0	8	47	1	16
Future Volume (veh/h)	11	1488	8	5	1223	47	3	0	8	47	1	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	11	1534	8	5	1261	48	3	0	8	48	1	16
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	42	2926	15	11	2183	83	354	253	215	400	6	215
Arrive On Green	0.01	0.46	0.46	0.01	0.46	0.46	0.14	0.00	0.14	0.14	0.14	0.14
Sat Flow, veh/h	2910	6305	33	1594	4782	182	1318	1772	1502	1373	43	1502
Grp Volume(v), veh/h	11	1112	430	5	850	459	3	0	8	49	0	16
Grp Sat Flow(s),veh/h/ln	1455	1524	1766	1594	1612	1739	1318	1772	1502	1416	0	1502
Q Serve(g_s), s	0.1	6.0	6.0	0.1	6.8	6.8	0.1	0.0	0.2	1.0	0.0	0.3
Cycle Q Clear(g_c), s	0.1	6.0	6.0	0.1	6.8	6.8	1.1	0.0	0.2	1.1	0.0	0.3
Prop In Lane	1.00		0.02	1.00		0.10	1.00		1.00	0.98		1.00
Lane Grp Cap(c), veh/h	42	2122	820	11	1472	794	354	253	215	406	0	215
V/C Ratio(X)	0.26	0.52	0.52	0.46	0.58	0.58	0.01	0.00	0.04	0.12	0.00	0.07
Avail Cap(c_a), veh/h	424	2680	1035	296	2020	1089	901	988	837	992	0	837
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.0	6.6	6.6	17.3	7.0	7.0	13.8	0.0	12.9	13.3	0.0	13.0
Incr Delay (d2), s/veh	3.2	0.2	0.5	27.8	0.4	0.7	0.0	0.0	0.1	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.2	1.4	0.1	1.5	1.7	0.0	0.0	0.0	0.3	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.3	6.8	7.2	45.1	7.4	7.7	13.8	0.0	13.0	13.4	0.0	13.1
LnGrp LOS	C	A	A	D	A	A	B	A	B	B	A	B
Approach Vol, veh/h		1553			1314			11			65	
Approach Delay, s/veh		7.0			7.6			13.2			13.4	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	4.7	20.7		9.5	5.0	20.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		19.5	6.5	20.5		19.5	5.1	21.9				
Max Q Clear Time (g_c+I1), s		3.1	2.1	8.0		3.1	2.1	8.8				
Green Ext Time (p_c), s		0.0	0.0	8.0		0.2	0.0	7.2				

Intersection Summary	
HCM 6th Ctrl Delay	7.5
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.993					0.865
Flt Protected						
Satd. Flow (prot)	4784	0	0	4818	0	1526
Flt Permitted						
Satd. Flow (perm)	4784	0	0	4818	0	1526
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	1468	75	0	1296	0	16
Future Volume (vph)	1468	75	0	1296	0	16
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1545	79	0	1364	0	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1624	0	0	1364	0	17

Intersection Summary

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1468	75	0	1296	0	16
Future Vol, veh/h	1468	75	0	1296	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1545	79	0	1364	0	17

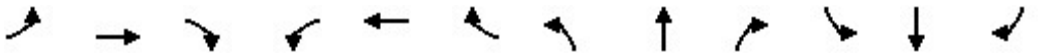
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	812
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	276
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	276
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	18.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	276	-	-	-
HCM Lane V/C Ratio	0.061	-	-	-
HCM Control Delay (s)	18.9	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.979	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5943	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5943	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			253			323			95		33	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



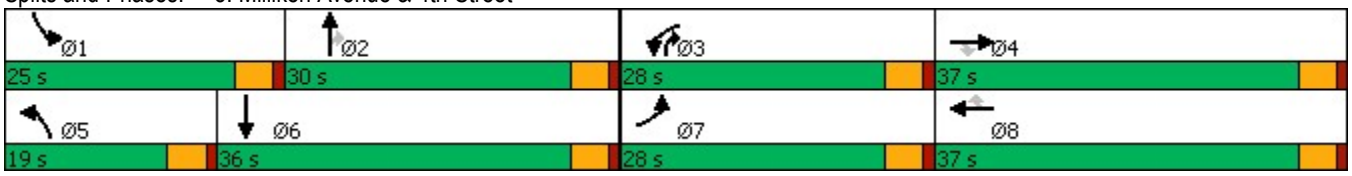
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	280	1155	403	535	899	327	328	993	372	439	963	158
Future Volume (vph)	280	1155	403	535	899	327	328	993	372	439	963	158
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	295	1216	424	563	946	344	345	1045	392	462	1014	166
Shared Lane Traffic (%)												
Lane Group Flow (vph)	295	1216	424	563	946	344	345	1045	392	462	1180	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	280	1155	403	535	899	327	328	993	372	439	963
Future Volume (vph)	280	1155	403	535	899	327	328	993	372	439	963
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	28.0	37.0	37.0	28.0	37.0	37.0	19.0	30.0	28.0	25.0	36.0
Total Split (%)	23.3%	30.8%	30.8%	23.3%	30.8%	30.8%	15.8%	25.0%	23.3%	20.8%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	17.4	32.5	32.5	23.5	38.6	38.6	14.5	25.1	53.1	20.5	31.1
Actuated g/C Ratio	0.15	0.27	0.27	0.20	0.32	0.32	0.12	0.21	0.44	0.17	0.26
v/c Ratio	0.70	0.93	0.72	0.99	0.61	0.49	0.99	0.82	0.55	0.94	0.75
Control Delay	57.6	55.6	23.1	84.0	36.9	7.2	97.3	51.2	21.3	76.6	43.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.6	55.6	23.1	84.0	36.9	7.2	97.3	51.2	21.3	76.6	43.1
LOS	E	E	C	F	D	A	F	D	C	E	D
Approach Delay		48.8			45.7			53.6			52.5
Approach LOS		D			D			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.6	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 50.0	Intersection LOS: D
Intersection Capacity Utilization 86.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 5: Milliken Avenue & 4th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	295	1216	424	563	946	344	345	1045	392	462	1180
v/c Ratio	0.70	0.93	0.72	0.99	0.61	0.49	0.99	0.82	0.55	0.94	0.75
Control Delay	57.6	55.6	23.1	84.0	36.9	7.2	97.3	51.2	21.3	76.6	43.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.6	55.6	23.1	84.0	36.9	7.2	97.3	51.2	21.3	76.6	43.1
Queue Length 50th (ft)	113	337	121	226	226	11	139	225	164	184	237
Queue Length 95th (ft)	154	#427	248	#345	291	91	#238	267	261	#285	280
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	568	1309	591	568	1554	702	350	1295	719	495	1590
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.93	0.72	0.99	0.61	0.49	0.99	0.81	0.55	0.93	0.74

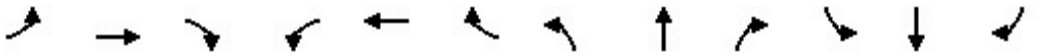
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	1155	403	535	899	327	328	993	372	439	963	158
Future Volume (veh/h)	280	1155	403	535	899	327	328	993	372	439	963	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	295	1216	424	563	946	344	345	1045	392	462	1014	166
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	354	1310	407	570	1669	518	352	1295	613	497	1398	226
Arrive On Green	0.12	0.27	0.27	0.20	0.34	0.34	0.12	0.21	0.21	0.17	0.26	0.26
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	2910	6095	1502	2910	5327	862
Grp Volume(v), veh/h	295	1216	424	563	946	344	345	1045	392	462	869	311
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1455	1524	1502	1455	1524	1617
Q Serve(g_s), s	11.9	29.4	32.5	23.1	19.1	23.4	14.2	19.6	25.1	18.8	20.8	21.1
Cycle Q Clear(g_c), s	11.9	29.4	32.5	23.1	19.1	23.4	14.2	19.6	25.1	18.8	20.8	21.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.53
Lane Grp Cap(c), veh/h	354	1310	407	570	1669	518	352	1295	613	497	1200	424
V/C Ratio(X)	0.83	0.93	1.04	0.99	0.57	0.66	0.98	0.81	0.64	0.93	0.72	0.73
Avail Cap(c_a), veh/h	570	1310	407	570	1669	518	352	1295	613	497	1200	424
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.5	42.6	43.8	48.1	32.0	33.4	52.6	44.9	28.4	49.0	40.3	40.4
Incr Delay (d2), s/veh	5.7	11.6	56.1	34.5	0.5	3.2	42.8	3.9	2.2	24.1	2.2	6.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	13.0	18.3	11.1	7.5	8.9	7.3	7.7	9.3	8.5	8.0	9.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.2	54.2	99.9	82.6	32.5	36.6	95.4	48.8	30.7	73.1	42.5	46.9
LnGrp LOS	E	D	F	F	C	D	F	D	C	E	D	D
Approach Vol, veh/h		1935			1853			1782			1642	
Approach Delay, s/veh		64.7			48.5			53.8			51.9	
Approach LOS		E			D			D			D	

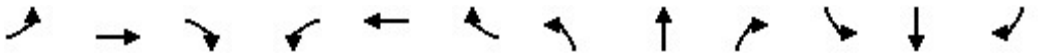
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.0	30.0	28.0	37.0	19.0	36.0	19.1	45.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	20.5	25.5	23.5	32.5	14.5	31.5	23.5	32.5
Max Q Clear Time (g_c+I1), s	20.8	27.1	25.1	34.5	16.2	23.1	13.9	25.4
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	4.8	0.7	4.2

Intersection Summary	
HCM 6th Ctrl Delay	54.9
HCM 6th LOS	D



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.942	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	3025	1365
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	3025	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			148			286			355		108	400
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



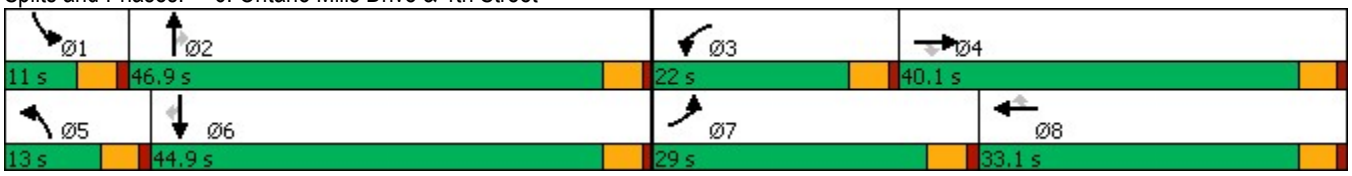
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	779	1305	156	431	1074	529	182	318	496	110	632	869
Future Volume (vph)	779	1305	156	431	1074	529	182	318	496	110	632	869
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	811	1359	163	449	1119	551	190	331	517	115	658	905
Shared Lane Traffic (%)												46%
Lane Group Flow (vph)	811	1359	163	449	1119	551	190	331	517	115	1074	489

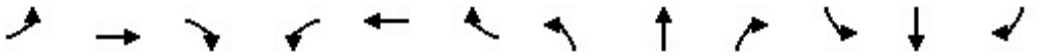
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	779	1305	156	431	1074	529	182	318	496	110	632	869
Future Volume (vph)	779	1305	156	431	1074	529	182	318	496	110	632	869
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	29.0	40.1	40.1	22.0	33.1	33.1	13.0	46.9	46.9	11.0	44.9	44.9
Total Split (%)	24.2%	33.4%	33.4%	18.3%	27.6%	27.6%	10.8%	39.1%	39.1%	9.2%	37.4%	37.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	24.5	35.6	35.6	17.5	28.6	28.6	8.5	42.4	42.4	6.5	40.4	40.4
Actuated g/C Ratio	0.20	0.30	0.30	0.15	0.24	0.24	0.07	0.35	0.35	0.05	0.34	0.34
v/c Ratio	1.37	0.95	0.30	1.07	0.97	0.96	1.70	0.28	0.68	1.35	0.99	0.68
Control Delay	216.2	56.3	8.0	111.4	66.7	50.8	382.5	28.7	14.9	260.6	59.8	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	216.2	56.3	8.0	111.4	66.7	50.8	382.5	28.7	14.9	260.6	59.8	11.8
LOS	F	E	A	F	E	D	F	C	B	F	E	B
Approach Delay		108.5			72.0			86.6			59.6	
Approach LOS		F			E			F			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.70	
Intersection Signal Delay: 83.1	Intersection LOS: F
Intersection Capacity Utilization 102.8%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 6: Ontario Mills Drive & 4th Street



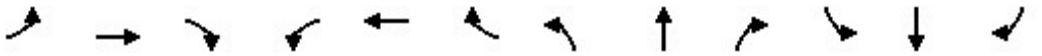


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	811	1359	163	449	1119	551	190	331	517	115	1074	489
v/c Ratio	1.37	0.95	0.30	1.07	0.97	0.96	1.70	0.28	0.68	1.35	0.99	0.68
Control Delay	216.2	56.3	8.0	111.4	66.7	50.8	382.5	28.7	14.9	260.6	59.8	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	216.2	56.3	8.0	111.4	66.7	50.8	382.5	28.7	14.9	260.6	59.8	11.8
Queue Length 50th (ft)	~428	377	8	~197	316	230	~216	96	100	~116	417	53
Queue Length 95th (ft)	#553	#476	60	#303	#415	#464	#366	134	233	#239	#577	192
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	590	1429	549	421	1148	575	112	1184	759	85	1090	724
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.37	0.95	0.30	1.07	0.97	0.96	1.70	0.28	0.68	1.35	0.99	0.68

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



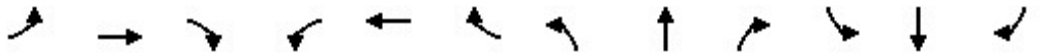
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	779	1305	156	431	1074	529	182	318	496	110	632	869
Future Volume (veh/h)	779	1305	156	431	1074	529	182	318	496	110	632	869
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	811	1359	162	449	1119	551	190	331	517	115	658	905
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	594	1435	445	424	1153	358	113	1190	531	86	597	1011
Arrive On Green	0.20	0.30	0.30	0.15	0.24	0.24	0.07	0.35	0.35	0.05	0.34	0.34
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	1594	3367	1502	1594	1772	3003
Grp Volume(v), veh/h	811	1359	162	449	1119	551	190	331	517	115	658	905
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1594	1683	1502	1594	1772	1502
Q Serve(g_s), s	24.5	33.0	10.2	17.5	27.5	28.6	8.5	8.5	40.7	6.5	40.4	34.3
Cycle Q Clear(g_c), s	24.5	33.0	10.2	17.5	27.5	28.6	8.5	8.5	40.7	6.5	40.4	34.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	594	1435	445	424	1153	358	113	1190	531	86	597	1011
V/C Ratio(X)	1.36	0.95	0.36	1.06	0.97	1.54	1.68	0.28	0.97	1.33	1.10	0.90
Avail Cap(c_a), veh/h	594	1435	445	424	1153	358	113	1190	531	86	597	1011
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.8	41.3	33.3	51.3	45.3	45.7	55.8	27.8	38.3	56.8	39.8	37.8
Incr Delay (d2), s/veh	174.9	13.2	0.5	59.8	19.7	256.4	342.6	0.1	32.5	209.2	68.3	10.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	23.3	14.7	3.8	9.9	13.0	36.1	14.2	3.4	19.5	7.6	28.6	13.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	222.6	54.5	33.8	111.1	65.0	302.1	398.3	28.0	70.7	265.9	108.1	48.2
LnGrp LOS	F	D	C	F	E	F	F	C	E	F	F	D
Approach Vol, veh/h		2332			2119			1038			1678	
Approach Delay, s/veh		111.5			136.4			117.1			86.6	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	46.9	22.0	40.1	13.0	44.9	29.0	33.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	42.4	17.5	35.6	8.5	40.4	24.5	28.6
Max Q Clear Time (g_c+I1), s	8.5	42.7	19.5	35.0	10.5	42.4	26.5	30.6
Green Ext Time (p_c), s	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	113.9
HCM 6th LOS	F

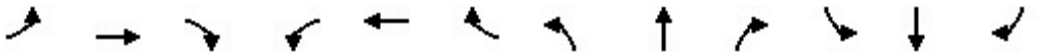
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.981			0.943				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.982	
Satd. Flow (prot)	2891	4818	1500	1583	4726	0	1583	3162	0	1504	1646	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.982	
Satd. Flow (perm)	2891	4818	1500	1583	4726	0	1583	3162	0	1504	1646	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132		19			50				317
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



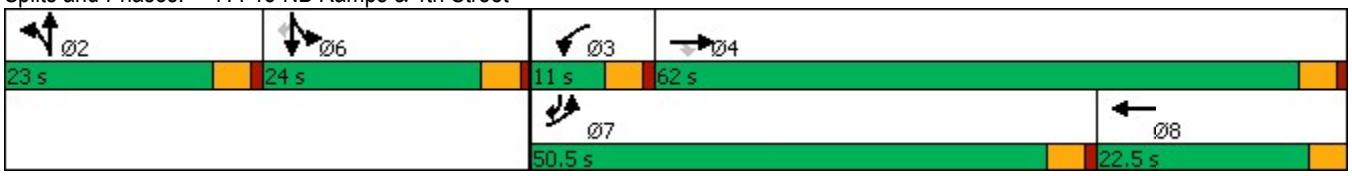
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1108	647	124	32	745	107	126	76	47	175	84	1183
Future Volume (vph)	1108	647	124	32	745	107	126	76	47	175	84	1183
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1179	688	132	34	793	114	134	81	50	186	89	1259
Shared Lane Traffic (%)										27%		
Lane Group Flow (vph)	1179	688	132	34	907	0	134	131	0	136	139	1259

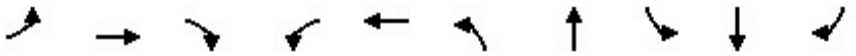
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	1108	647	124	32	745	126	76	175	84	1183
Future Volume (vph)	1108	647	124	32	745	126	76	175	84	1183
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	50.5	62.0	62.0	11.0	22.5	23.0	23.0	24.0	24.0	50.5
Total Split (%)	42.1%	51.7%	51.7%	9.2%	18.8%	19.2%	19.2%	20.0%	20.0%	42.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	46.2	62.5	62.5	6.3	19.1	14.1	14.1	14.8	14.8	65.5
Actuated g/C Ratio	0.42	0.56	0.56	0.06	0.17	0.13	0.13	0.13	0.13	0.59
v/c Ratio	0.98	0.25	0.15	0.38	1.10	0.67	0.29	0.68	0.64	0.75
Control Delay	55.6	14.7	3.3	65.8	104.4	63.6	29.3	64.3	59.9	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.6	14.7	3.3	65.8	104.4	63.6	29.3	64.3	59.9	15.7
LOS	E	B	A	E	F	E	C	E	E	B
Approach Delay		38.1			103.0		46.6		24.0	
Approach LOS		D			F		D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 111.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.10	
Intersection Signal Delay: 46.9	Intersection LOS: D
Intersection Capacity Utilization 85.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street





Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1179	688	132	34	907	134	131	136	139	1259
v/c Ratio	0.98	0.25	0.15	0.38	1.10	0.67	0.29	0.68	0.64	0.75
Control Delay	55.6	14.7	3.3	65.8	104.4	63.6	29.3	64.3	59.9	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.6	14.7	3.3	65.8	104.4	63.6	29.3	64.3	59.9	15.7
Queue Length 50th (ft)	428	99	0	24	~270	93	27	98	101	271
Queue Length 95th (ft)	#652	144	33	61	#398	164	59	174	176	398
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	1200	2706	900	92	826	264	569	264	289	1684
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.25	0.15	0.37	1.10	0.51	0.23	0.52	0.48	0.75

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1108	647	124	32	745	107	126	76	47	175	84	1183
Future Volume (veh/h)	1108	647	124	32	745	107	126	76	47	175	84	1183
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	1179	688	132	34	793	114	134	81	50	138	157	1259
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1169	2606	809	46	709	101	167	217	124	271	302	1718
Arrive On Green	0.40	0.54	0.54	0.03	0.17	0.17	0.10	0.10	0.10	0.17	0.17	0.17
Sat Flow, veh/h	2910	4837	1502	1594	4276	611	1594	2063	1180	1594	1772	3003
Grp Volume(v), veh/h	1179	688	132	34	597	310	134	65	66	138	157	1259
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1594	1612	1662	1594	1683	1560	1594	1772	1502
Q Serve(g_s), s	46.0	8.8	5.1	2.4	19.0	19.0	9.4	4.1	4.5	9.0	9.2	19.5
Cycle Q Clear(g_c), s	46.0	8.8	5.1	2.4	19.0	19.0	9.4	4.1	4.5	9.0	9.2	19.5
Prop In Lane	1.00		1.00	1.00		0.37	1.00		0.76	1.00		1.00
Lane Grp Cap(c), veh/h	1169	2606	809	46	535	276	167	177	164	271	302	1718
V/C Ratio(X)	1.01	0.26	0.16	0.74	1.12	1.13	0.80	0.37	0.40	0.51	0.52	0.73
Avail Cap(c_a), veh/h	1169	2606	809	90	535	276	257	272	252	271	302	1718
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.3	14.2	13.4	55.2	47.8	47.8	50.1	47.7	47.9	43.2	43.3	18.1
Incr Delay (d2), s/veh	28.5	0.1	0.1	20.4	74.5	92.2	9.7	1.3	1.6	1.6	1.6	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.4	3.2	1.7	1.2	13.1	14.9	4.2	1.8	1.8	3.7	4.2	12.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.7	14.3	13.5	75.6	122.3	140.0	59.8	49.0	49.5	44.7	44.8	19.7
LnGrp LOS	F	B	B	E	F	F	E	D	D	D	D	B
Approach Vol, veh/h		1999			941			265			1554	
Approach Delay, s/veh		42.8			126.4			54.6			24.5	
Approach LOS		D			F			D			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		16.5	7.8	66.2		24.0	50.5	23.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		18.5	6.5	57.5		19.5	46.0	* 19				
Max Q Clear Time (g_c+I1), s		11.4	4.4	10.8		21.5	48.0	21.0				
Green Ext Time (p_c), s		0.6	0.0	6.2		0.0	0.0	0.0				

Intersection Summary		
HCM 6th Ctrl Delay		54.0
HCM 6th LOS		D

Notes

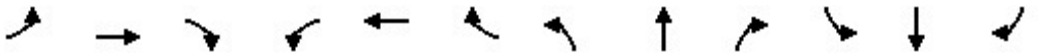
User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

User approved changes to right turn type.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.903				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3028	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3028	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		50				236			253			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



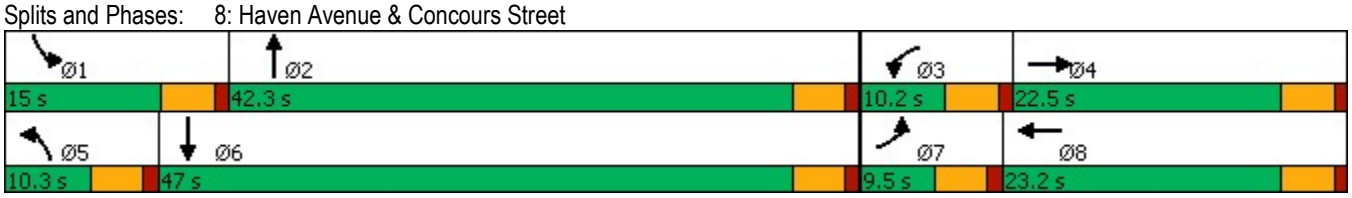
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	12	25	47	195	54	60	45	1871	269	274	1756	31
Future Volume (vph)	12	25	47	195	54	60	45	1871	269	274	1756	31
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	13	27	50	207	57	64	48	1990	286	291	1868	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	77	0	207	57	64	48	1990	286	291	1868	33

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	12	25	195	54	60	45	1871	269	274	1756	31
Future Volume (vph)	12	25	195	54	60	45	1871	269	274	1756	31
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	10.2	23.2		10.3	42.3		15.0	47.0	
Total Split (%)	10.6%	25.0%	11.3%	25.8%		11.4%	47.0%		16.7%	52.2%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.1	6.4	5.8	12.5	75.2	5.8	36.8	75.2	10.5	46.0	75.2
Actuated g/C Ratio	0.07	0.09	0.08	0.17	1.00	0.08	0.49	1.00	0.14	0.61	1.00
v/c Ratio	0.07	0.25	0.69	0.10	0.04	0.22	0.67	0.19	0.72	0.50	0.02
Control Delay	35.9	18.4	48.7	28.6	0.1	37.1	16.4	0.3	44.3	10.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.9	18.4	48.7	28.6	0.1	37.1	16.4	0.3	44.3	10.3	0.0
LOS	D	B	D	C	A	D	B	A	D	B	A
Approach Delay		20.9		35.7			14.9			14.7	
Approach LOS		C		D			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 75.2	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 16.3	Intersection LOS: B
Intersection Capacity Utilization 60.5%	ICU Level of Service B
Analysis Period (min) 15	

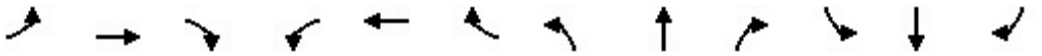
Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	13	77	207	57	64	48	1990	286	291	1868	33
v/c Ratio	0.07	0.25	0.69	0.10	0.04	0.22	0.67	0.19	0.72	0.50	0.02
Control Delay	35.9	18.4	48.7	28.6	0.1	37.1	16.4	0.3	44.3	10.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.9	18.4	48.7	28.6	0.1	37.1	16.4	0.3	44.3	10.3	0.0
Queue Length 50th (ft)	3	6	35	11	0	11	204	0	71	161	0
Queue Length 95th (ft)	11	26	#70	31	0	28	258	0	#131	205	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	194	770	301	842	1500	225	3084	1500	407	3710	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.10	0.69	0.07	0.04	0.21	0.65	0.19	0.71	0.50	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



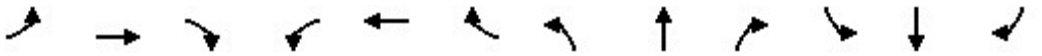
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	25	47	195	54	60	45	1871	269	274	1756	31
Future Volume (veh/h)	12	25	47	195	54	60	45	1871	269	274	1756	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	13	27	50	207	57	0	48	1990	0	291	1868	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	46	112	100	309	433		126	2885		371	3399	
Arrive On Green	0.02	0.07	0.07	0.08	0.13	0.00	0.04	0.47	0.00	0.13	0.56	0.00
Sat Flow, veh/h	2910	1683	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	13	27	50	207	57	0	48	1990	0	291	1868	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	0.3	1.1	2.3	3.6	1.1	0.0	1.1	18.0	0.0	6.9	13.8	0.0
Cycle Q Clear(g_c), s	0.3	1.1	2.3	3.6	1.1	0.0	1.1	18.0	0.0	6.9	13.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	46	112	100	309	433		126	2885		371	3399	
V/C Ratio(X)	0.28	0.24	0.50	0.67	0.13		0.38	0.69		0.79	0.55	
Avail Cap(c_a), veh/h	206	429	382	320	891		239	3260		432	3665	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.4	31.3	31.8	31.7	27.3	0.0	32.9	14.6	0.0	29.9	10.0	0.0
Incr Delay (d2), s/veh	3.2	1.1	3.8	5.1	0.1	0.0	1.9	0.5	0.0	8.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.5	0.9	1.3	0.4	0.0	0.4	5.6	0.0	2.7	3.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.6	32.4	35.6	36.8	27.4	0.0	34.8	15.1	0.0	37.9	10.1	0.0
LnGrp LOS	D	C	D	D	C		C	B		D	B	
Approach Vol, veh/h		90			264	A		2038	A		2159	A
Approach Delay, s/veh		34.9			34.8			15.6			13.9	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.5	38.0	10.0	9.2	7.6	43.9	5.6	13.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	37.8	5.7	18.0	5.8	42.5	5.0	18.7
Max Q Clear Time (g_c+I1), s	8.9	20.0	5.6	4.3	3.1	15.8	2.3	3.1
Green Ext Time (p_c), s	0.2	13.4	0.0	0.3	0.0	17.0	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	16.3
HCM 6th LOS	B

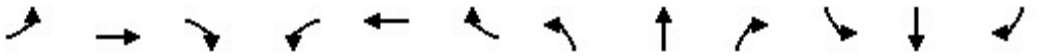
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.944									0.989	
Flt Protected	0.950	0.970					0.950					
Satd. Flow (prot)	1593	1535	0	0	1765	0	1676	4818	0	1765	4765	0
Flt Permitted	0.950	0.970					0.950					
Satd. Flow (perm)	1593	1535	0	0	1765	0	1676	4818	0	1765	4765	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		143									15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



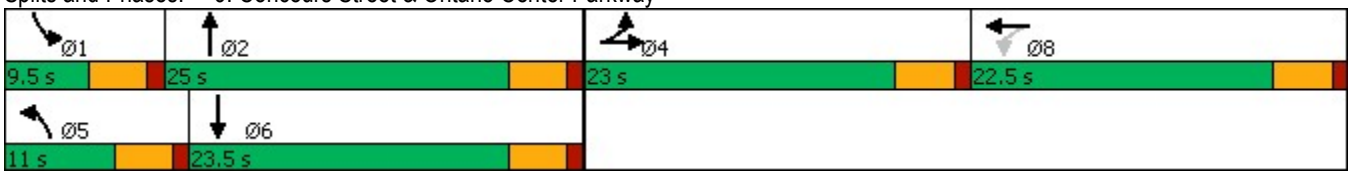
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	13	0	3	0	0	0	5	305	1	0	228	18
Future Volume (vph)	13	0	3	0	0	0	5	305	1	0	228	18
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	14	0	3	0	0	0	6	339	1	0	253	20
Shared Lane Traffic (%)	38%											
Lane Group Flow (vph)	9	8	0	0	0	0	6	340	0	0	273	0

Intersection Summary

Lane Group	EBL	EBT	NBL	NBT	SBT	Ø1	Ø8
Lane Configurations							
Traffic Volume (vph)	13	0	5	305	228		
Future Volume (vph)	13	0	5	305	228		
Turn Type	Split	NA	Prot	NA	NA		
Protected Phases	4	4	5	2	6	1	8
Permitted Phases							
Detector Phase	4	4	5	2	6		
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	9.5	22.5
Total Split (s)	23.0	23.0	11.0	25.0	23.5	9.5	22.5
Total Split (%)	28.8%	28.8%	13.8%	31.3%	29.4%	12%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		
Lead/Lag			Lead	Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	Min	Min	None	None
Act Effct Green (s)	5.9	5.9	5.9	26.8	25.4		
Actuated g/C Ratio	0.20	0.20	0.20	0.93	0.88		
v/c Ratio	0.03	0.02	0.02	0.08	0.07		
Control Delay	12.5	0.1	12.6	1.1	3.0		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	12.5	0.1	12.6	1.1	3.0		
LOS	B	A	B	A	A		
Approach Delay		6.7		1.3	3.0		
Approach LOS		A		A	A		

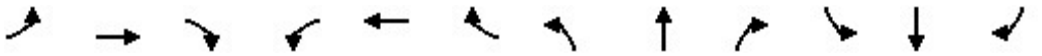
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 28.9	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.08	
Intersection Signal Delay: 2.1	Intersection LOS: A
Intersection Capacity Utilization 17.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	NBL	NBT	SBT
Lane Group Flow (vph)	9	8	6	340	273
v/c Ratio	0.03	0.02	0.02	0.08	0.07
Control Delay	12.5	0.1	12.6	1.1	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.5	0.1	12.6	1.1	3.0
Queue Length 50th (ft)	1	0	1	0	0
Queue Length 95th (ft)	11	0	8	15	25
Internal Link Dist (ft)		319		111	176
Turn Bay Length (ft)	170		115		
Base Capacity (vph)	1063	1072	392	4468	4241
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.01	0.02	0.08	0.06

Intersection Summary



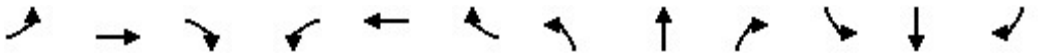
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	0	3	0	0	0	5	305	1	0	228	18
Future Volume (veh/h)	13	0	3	0	0	0	5	305	1	0	228	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	17	0	0	0	0	0	6	339	1	0	253	20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	76	40	0	0	9	0	14	2519	7	9	1199	93
Arrive On Green	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.51	0.51	0.00	0.26	0.26
Sat Flow, veh/h	3375	1772	0	0	1772	0	1688	4979	15	1688	4577	356
Grp Volume(v), veh/h	17	0	0	0	0	0	6	219	121	0	177	96
Grp Sat Flow(s),veh/h/ln	1688	1772	0	0	1772	0	1688	1612	1769	1688	1612	1708
Q Serve(g_s), s	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.7	0.0	0.8	0.8
Cycle Q Clear(g_c), s	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.7	0.0	0.8	0.8
Prop In Lane	1.00		0.00	0.00		0.00	1.00		0.01	1.00		0.21
Lane Grp Cap(c), veh/h	76	40	0	0	9	0	14	1632	895	9	845	447
V/C Ratio(X)	0.22	0.00	0.00	0.00	0.00	0.00	0.43	0.13	0.13	0.00	0.21	0.21
Avail Cap(c_a), veh/h	3271	1717	0	0	1671	0	575	3464	1900	442	3210	1700
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	9.2	0.0	0.0	0.0	0.0	0.0	9.4	2.5	2.5	0.0	5.5	5.5
Incr Delay (d2), s/veh	1.5	0.0	0.0	0.0	0.0	0.0	19.9	0.0	0.1	0.0	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.6	0.0	0.0	0.0	0.0	0.0	29.4	2.5	2.6	0.0	5.6	5.7
LnGrp LOS	B	A	A	A	A	A	C	A	A	A	A	A
Approach Vol, veh/h		17			0			346			273	
Approach Delay, s/veh		10.6			0.0			3.0			5.7	
Approach LOS		B						A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	14.2		4.9	4.7	9.5		0.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	20.5		18.5	6.5	19.0		18.0				
Max Q Clear Time (g_c+I1), s	0.0	2.7		2.1	2.1	2.8		0.0				
Green Ext Time (p_c), s	0.0	1.9		0.0	0.0	1.4		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	4.4
HCM 6th LOS	A

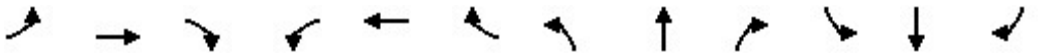
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			198			226			184			197
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



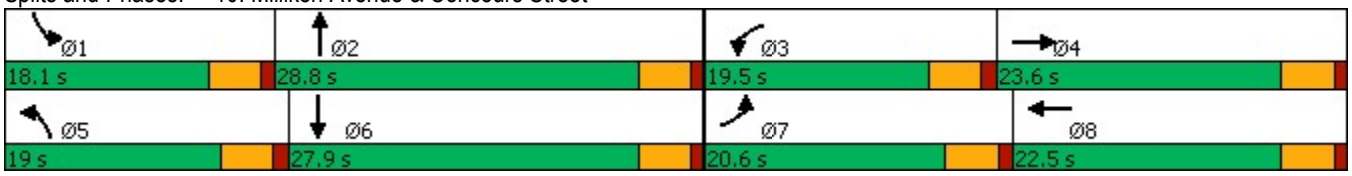
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	302	156	184	272	102	210	227	1216	254	330	1217	235
Future Volume (vph)	302	156	184	272	102	210	227	1216	254	330	1217	235
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	325	168	198	292	110	226	244	1308	273	355	1309	253
Shared Lane Traffic (%)												
Lane Group Flow (vph)	325	168	198	292	110	226	244	1308	273	355	1309	253

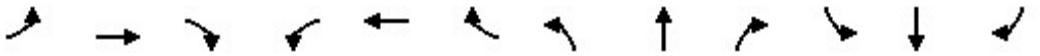
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	302	156	184	272	102	210	227	1216	254	330	1217	235
Future Volume (vph)	302	156	184	272	102	210	227	1216	254	330	1217	235
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	20.6	23.6		19.5	22.5		19.0	28.8		18.1	27.9	
Total Split (%)	22.9%	26.2%		21.7%	25.0%		21.1%	32.0%		20.1%	31.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	15.9	9.2	76.5	12.6	8.4	76.5	11.5	23.5	76.5	13.0	25.0	76.5
Actuated g/C Ratio	0.21	0.12	1.00	0.16	0.11	1.00	0.15	0.31	1.00	0.17	0.33	1.00
v/c Ratio	0.54	0.41	0.13	0.61	0.30	0.15	0.56	0.70	0.18	0.72	0.66	0.17
Control Delay	32.7	35.3	0.2	36.4	34.7	0.2	36.1	26.3	0.3	40.8	25.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.7	35.3	0.2	36.4	34.7	0.2	36.1	26.3	0.3	40.8	25.0	0.2
LOS	C	D	A	D	C	A	D	C	A	D	C	A
Approach Delay		24.0			23.1			23.7			24.6	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 76.5	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 24.0	Intersection LOS: C
Intersection Capacity Utilization 59.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Milliken Avenue & Concours Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	325	168	198	292	110	226	244	1308	273	355	1309	253
v/c Ratio	0.54	0.41	0.13	0.61	0.30	0.15	0.56	0.70	0.18	0.72	0.66	0.17
Control Delay	32.7	35.3	0.2	36.4	34.7	0.2	36.1	26.3	0.3	40.8	25.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.7	35.3	0.2	36.4	34.7	0.2	36.1	26.3	0.3	40.8	25.0	0.2
Queue Length 50th (ft)	76	40	0	69	26	0	57	161	0	85	155	0
Queue Length 95th (ft)	121	72	0	111	52	0	95	217	0	#150	221	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	650	843	1500	571	795	1500	552	1944	1500	518	1994	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.20	0.13	0.51	0.14	0.15	0.44	0.67	0.18	0.69	0.66	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

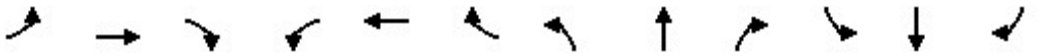
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	302	156	184	272	102	210	227	1216	254	330	1217	235
Future Volume (veh/h)	302	156	184	272	102	210	227	1216	254	330	1217	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	325	168	0	292	110	0	244	1308	0	355	1309	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	436	314		399	271		346	1963		458	2199	
Arrive On Green	0.15	0.09	0.00	0.14	0.08	0.00	0.12	0.32	0.00	0.16	0.36	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	325	168	0	292	110	0	244	1308	0	355	1309	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	6.6	3.0	0.0	6.0	1.9	0.0	5.0	11.5	0.0	7.3	10.8	0.0
Cycle Q Clear(g_c), s	6.6	3.0	0.0	6.0	1.9	0.0	5.0	11.5	0.0	7.3	10.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	436	314		399	271		346	1963		458	2199	
V/C Ratio(X)	0.75	0.53		0.73	0.41		0.71	0.67		0.77	0.60	
Avail Cap(c_a), veh/h	755	1036		703	977		680	2387		638	2298	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.3	26.8	0.0	25.7	27.1	0.0	26.3	18.2	0.0	25.1	16.1	0.0
Incr Delay (d2), s/veh	2.6	1.4	0.0	2.6	1.0	0.0	2.6	0.5	0.0	4.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	1.2	0.0	2.1	0.8	0.0	1.8	3.7	0.0	2.6	3.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.8	28.3	0.0	28.3	28.1	0.0	28.9	18.7	0.0	29.0	16.5	0.0
LnGrp LOS	C	C		C	C		C	B		C	B	
Approach Vol, veh/h		493	A		402	A		1552	A		1664	A
Approach Delay, s/veh		28.0			28.2			20.3			19.2	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.3	24.5	13.0	10.3	11.9	26.9	13.8	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.6	24.3	15.0	19.1	14.5	23.4	16.1	18.0
Max Q Clear Time (g_c+I1), s	9.3	13.5	8.0	5.0	7.0	12.8	8.6	3.9
Green Ext Time (p_c), s	0.5	6.5	0.6	0.8	0.5	6.4	0.7	0.4

Intersection Summary	
HCM 6th Ctrl Delay	21.6
HCM 6th LOS	C

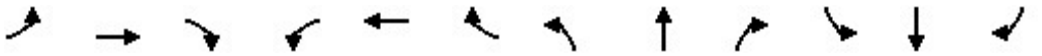
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			182			424			182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



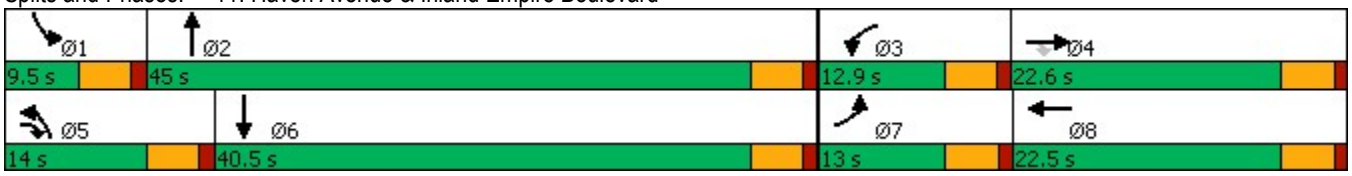
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	224	148	336	189	146	71	252	1890	570	55	1681	199
Future Volume (vph)	224	148	336	189	146	71	252	1890	570	55	1681	199
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	231	153	346	195	151	73	260	1948	588	57	1733	205
Shared Lane Traffic (%)												
Lane Group Flow (vph)	231	153	346	195	151	73	260	1948	588	57	1733	205

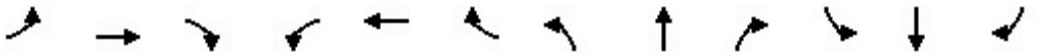
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	224	148	336	189	146	71	252	1890	570	55	1681	199
Future Volume (vph)	224	148	336	189	146	71	252	1890	570	55	1681	199
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	13.0	22.6	14.0	12.9	22.5		14.0	45.0		9.5	40.5	
Total Split (%)	14.4%	25.1%	15.6%	14.3%	25.0%		15.6%	50.0%		10.6%	45.0%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	8.5	9.4	23.4	8.1	8.9	79.6	9.5	43.1	79.6	5.0	34.5	79.6
Actuated g/C Ratio	0.11	0.12	0.29	0.10	0.11	1.00	0.12	0.54	1.00	0.06	0.43	1.00
v/c Ratio	0.75	0.39	0.70	0.49	0.40	0.05	0.75	0.59	0.39	0.31	0.66	0.14
Control Delay	51.9	36.0	28.7	39.0	36.5	0.1	50.2	14.2	0.8	41.9	19.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.9	36.0	28.7	39.0	36.5	0.1	50.2	14.2	0.8	41.9	19.4	0.2
LOS	D	D	C	D	D	A	D	B	A	D	B	A
Approach Delay		37.6			31.3			14.7			18.1	
Approach LOS		D			C			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 79.6	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 19.8	Intersection LOS: B
Intersection Capacity Utilization 63.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	231	153	346	195	151	73	260	1948	588	57	1733	205
v/c Ratio	0.75	0.39	0.70	0.49	0.40	0.05	0.75	0.59	0.39	0.31	0.66	0.14
Control Delay	51.9	36.0	28.7	39.0	36.5	0.1	50.2	14.2	0.8	41.9	19.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.9	36.0	28.7	39.0	36.5	0.1	50.2	14.2	0.8	41.9	19.4	0.2
Queue Length 50th (ft)	59	38	124	33	37	0	67	200	0	14	190	0
Queue Length 95th (ft)	#119	67	220	57	66	0	#128	254	0	34	243	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	309	764	492	417	760	1500	346	3284	1500	182	2754	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.20	0.70	0.47	0.20	0.05	0.75	0.59	0.39	0.31	0.63	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	224	148	336	189	146	71	252	1890	570	55	1681	199
Future Volume (veh/h)	224	148	336	189	146	71	252	1890	570	55	1681	199
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	231	153	346	195	151	0	260	1948	0	57	1733	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	294	728	492	289	634		323	2754		128	2344	
Arrive On Green	0.10	0.22	0.22	0.07	0.19	0.00	0.11	0.45	0.00	0.04	0.38	0.00
Sat Flow, veh/h	2910	3367	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	231	153	346	195	151	0	260	1948	0	57	1733	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	6.5	3.1	16.8	4.0	3.2	0.0	7.3	21.5	0.0	1.6	20.5	0.0
Cycle Q Clear(g_c), s	6.5	3.1	16.8	4.0	3.2	0.0	7.3	21.5	0.0	1.6	20.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	294	728	492	289	634		323	2754		128	2344	
V/C Ratio(X)	0.79	0.21	0.70	0.67	0.24		0.80	0.71		0.45	0.74	
Avail Cap(c_a), veh/h	296	728	492	398	724		330	2951		174	2623	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	36.7	26.9	24.6	37.8	28.9	0.0	36.3	18.5	0.0	39.0	22.1	0.0
Incr Delay (d2), s/veh	13.0	0.1	4.5	2.7	0.2	0.0	13.2	0.7	0.0	2.4	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	1.2	6.3	1.3	1.3	0.0	3.1	7.2	0.0	0.6	7.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.8	27.1	29.1	40.6	29.1	0.0	49.5	19.2	0.0	41.4	23.1	0.0
LnGrp LOS	D	C	C	D	C		D	B		D	C	
Approach Vol, veh/h		730			346	A		2208	A		1790	A
Approach Delay, s/veh		35.2			35.5			22.8			23.7	
Approach LOS		D			D			C			C	

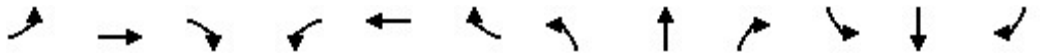
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	42.3	10.6	22.6	13.8	36.7	12.9	20.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	40.5	8.4	18.1	9.5	36.0	8.5	18.0
Max Q Clear Time (g_c+I1), s	3.6	23.5	6.0	18.8	9.3	22.5	8.5	5.2
Green Ext Time (p_c), s	0.0	12.7	0.1	0.0	0.0	9.7	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	25.8
HCM 6th LOS	C

Notes

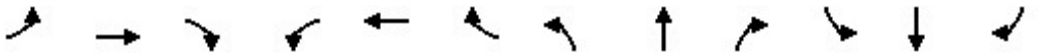
User approved changes to right turn type.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			281			193			518			193
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



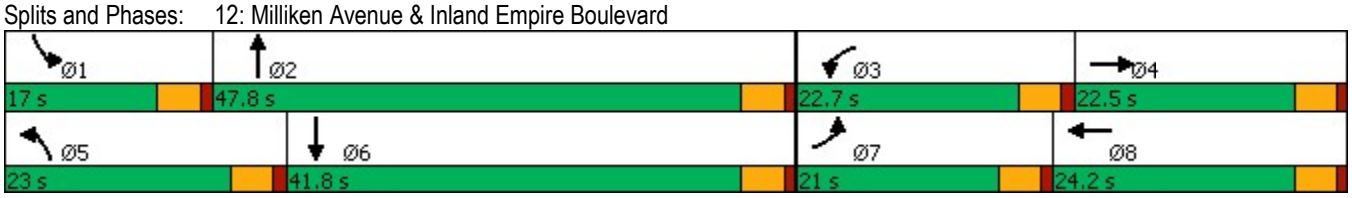
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	190	309	273	360	150	185	349	1278	794	192	1495	123
Future Volume (vph)	190	309	273	360	150	185	349	1278	794	192	1495	123
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	196	319	281	371	155	191	360	1318	819	198	1541	127
Shared Lane Traffic (%)												
Lane Group Flow (vph)	196	319	281	371	155	191	360	1318	819	198	1541	127

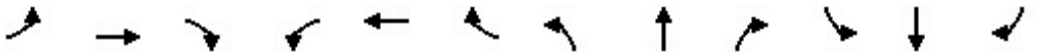
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	309	273	360	150	185	349	1278	794	192	1495	123
Future Volume (vph)	190	309	273	360	150	185	349	1278	794	192	1495	123
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	21.0	22.5		22.7	24.2		23.0	47.8		17.0	41.8	
Total Split (%)	19.1%	20.5%		20.6%	22.0%		20.9%	43.5%		15.5%	38.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	12.3	14.7	101.7	16.7	19.1	101.7	16.6	40.8	101.7	11.3	35.4	101.7
Actuated g/C Ratio	0.12	0.14	1.00	0.16	0.19	1.00	0.16	0.40	1.00	0.11	0.35	1.00
v/c Ratio	0.56	0.66	0.19	0.78	0.25	0.13	0.76	0.54	0.55	0.62	0.73	0.08
Control Delay	49.8	49.0	0.3	54.6	37.9	0.2	53.1	24.7	1.4	53.8	32.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.8	49.0	0.3	54.6	37.9	0.2	53.1	24.7	1.4	53.8	32.0	0.1
LOS	D	D	A	D	D	A	D	C	A	D	C	A
Approach Delay		32.0			36.5			21.2			32.1	
Approach LOS		C			D			C			C	

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 101.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 28.0	Intersection LOS: C
Intersection Capacity Utilization 70.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	196	319	281	371	155	191	360	1318	819	198	1541	127
v/c Ratio	0.56	0.66	0.19	0.78	0.25	0.13	0.76	0.54	0.55	0.62	0.73	0.08
Control Delay	49.8	49.0	0.3	54.6	37.9	0.2	53.1	24.7	1.4	53.8	32.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.8	49.0	0.3	54.6	37.9	0.2	53.1	24.7	1.4	53.8	32.0	0.1
Queue Length 50th (ft)	67	111	0	126	47	0	122	197	0	67	267	0
Queue Length 95th (ft)	103	158	0	#195	81	0	178	243	0	108	323	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	474	600	1500	523	676	1500	532	2617	1500	359	2254	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.53	0.19	0.71	0.23	0.13	0.68	0.50	0.55	0.55	0.68	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	309	273	360	150	185	349	1278	794	192	1495	123
Future Volume (veh/h)	190	309	273	360	150	185	349	1278	794	192	1495	123
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	196	319	0	371	155	0	360	1318	0	198	1541	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	269	432		449	641		439	2544		267	2182	
Arrive On Green	0.09	0.13	0.00	0.15	0.19	0.00	0.15	0.42	0.00	0.09	0.36	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	196	319	0	371	155	0	360	1318	0	198	1541	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	5.7	7.9	0.0	10.7	3.4	0.0	10.4	13.9	0.0	5.7	18.8	0.0
Cycle Q Clear(g_c), s	5.7	7.9	0.0	10.7	3.4	0.0	10.4	13.9	0.0	5.7	18.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	269	432		449	641		439	2544		267	2182	
V/C Ratio(X)	0.73	0.74		0.83	0.24		0.82	0.52		0.74	0.71	
Avail Cap(c_a), veh/h	555	701		613	767		623	3053		421	2630	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.2	36.3	0.0	35.4	29.7	0.0	35.6	18.7	0.0	38.3	23.8	0.0
Incr Delay (d2), s/veh	3.8	2.5	0.0	6.7	0.2	0.0	5.9	0.2	0.0	4.1	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	3.3	0.0	4.1	1.4	0.0	3.9	4.7	0.0	2.2	6.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.9	38.8	0.0	42.1	29.9	0.0	41.4	18.9	0.0	42.3	24.5	0.0
LnGrp LOS	D	D		D	C		D	B		D	C	
Approach Vol, veh/h		515	A		526	A		1678	A		1739	A
Approach Delay, s/veh		40.0			38.5			23.7			26.6	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.4	40.6	17.9	15.6	17.6	35.4	12.5	21.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	43.3	18.2	18.0	18.5	37.3	16.5	19.7
Max Q Clear Time (g_c+I1), s	7.7	15.9	12.7	9.9	12.4	20.8	7.7	5.4
Green Ext Time (p_c), s	0.3	11.4	0.7	1.2	0.7	10.2	0.4	0.7

Intersection Summary	
HCM 6th Ctrl Delay	28.4
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.924	0.850				
Flt Protected	0.976					
Satd. Flow (prot)	2916	1365	6071	0	0	6071
Flt Permitted	0.976					
Satd. Flow (perm)	2916	1365	6071	0	0	6071
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	3	3				
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

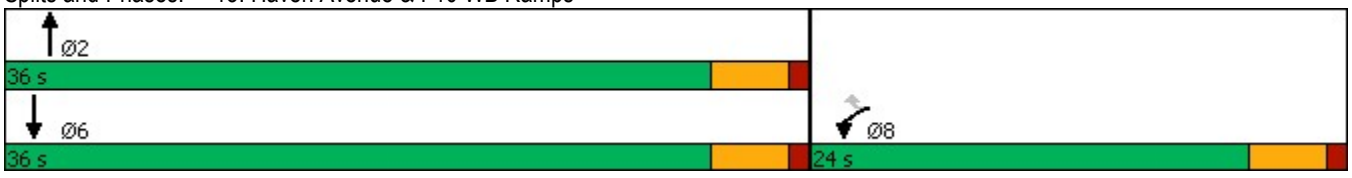
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	246	506	2163	0	0	1462
Future Volume (vph)	246	506	2163	0	0	1462
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.98	0.98	0.98	0.92	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	251	516	2207	0	0	1492
Shared Lane Traffic (%)		50%				
Lane Group Flow (vph)	509	258	2207	0	0	1492

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	246	506	2163	1462
Future Volume (vph)	246	506	2163	1462
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	36.0	36.0
Total Split (%)	40.0%	40.0%	60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	15.4	15.4	31.6	31.6
Actuated g/C Ratio	0.27	0.27	0.56	0.56
v/c Ratio	0.63	0.68	0.64	0.44
Control Delay	21.4	27.9	10.1	8.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.4	27.9	10.1	8.1
LOS	C	C	B	A
Approach Delay	23.6		10.1	8.1
Approach LOS	C		B	A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56.1	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 11.7	Intersection LOS: B
Intersection Capacity Utilization 74.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps



Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	509	258	2207	1492
v/c Ratio	0.63	0.68	0.64	0.44
Control Delay	21.4	27.9	10.1	8.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.4	27.9	10.1	8.1
Queue Length 50th (ft)	75	82	136	77
Queue Length 95th (ft)	117	157	196	114
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	1019	478	3423	3423
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.50	0.54	0.64	0.44

Intersection Summary

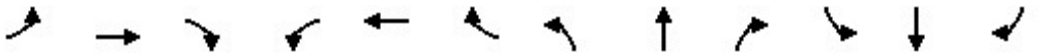
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	246	506	2163	0	0	1462
Future Volume (veh/h)	246	506	2163	0	0	1462
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1673	1772	1772	0	0	1772
Adj Flow Rate, veh/h	251	516	2207	0	0	1492
Peak Hour Factor	0.98	0.98	0.98	0.92	0.98	0.98
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	388	731	3499	0	0	3499
Arrive On Green	0.24	0.24	0.57	0.00	0.00	0.57
Sat Flow, veh/h	1594	3003	6592	0	0	6592
Grp Volume(v), veh/h	251	516	2207	0	0	1492
Grp Sat Flow(s),veh/h/ln	1594	1502	1524	0	0	1524
Q Serve(g_s), s	7.0	7.7	11.9	0.0	0.0	6.8
Cycle Q Clear(g_c), s	7.0	7.7	11.9	0.0	0.0	6.8
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	388	731	3499	0	0	3499
V/C Ratio(X)	0.65	0.71	0.63	0.00	0.00	0.43
Avail Cap(c_a), veh/h	631	1189	3897	0	0	3897
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	16.7	17.0	7.0	0.0	0.0	5.9
Incr Delay (d2), s/veh	1.8	1.3	0.3	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	2.5	2.6	0.0	0.0	1.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.6	18.3	7.3	0.0	0.0	6.0
LnGrp LOS	B	B	A	A	A	A
Approach Vol, veh/h	767		2207			1492
Approach Delay, s/veh	18.4		7.3			6.0
Approach LOS	B		A			A

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	32.8			32.8	16.5
Change Period (Y+Rc), s	4.5			4.5	4.5
Max Green Setting (Gmax), s	31.5			31.5	19.5
Max Q Clear Time (g_c+I1), s	13.9			8.8	9.7
Green Ext Time (p_c), s	14.4			12.0	2.3

Intersection Summary	
HCM 6th Ctrl Delay	8.8
HCM 6th LOS	A

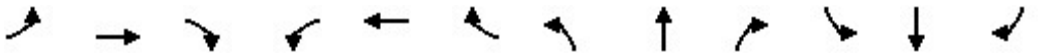
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			136			218			55
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



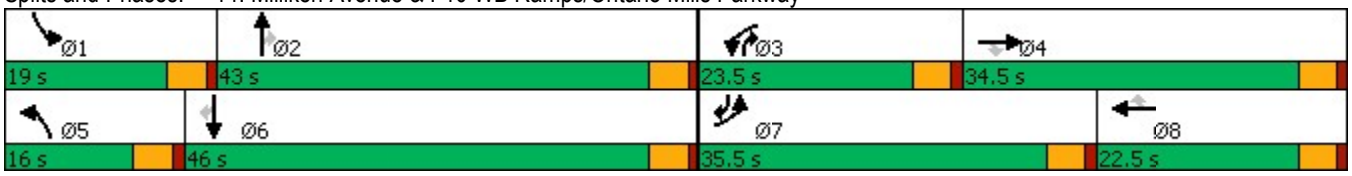
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	778	229	130	277	345	103	210	1361	420	305	1167	798
Future Volume (vph)	778	229	130	277	345	103	210	1361	420	305	1167	798
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	837	246	140	298	371	111	226	1463	452	328	1255	858
Shared Lane Traffic (%)												
Lane Group Flow (vph)	837	246	140	298	371	111	226	1463	452	328	1255	858

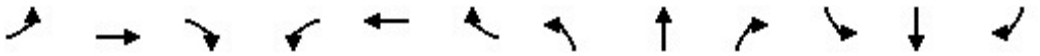
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	778	229	130	277	345	103	210	1361	420	305	1167	798
Future Volume (vph)	778	229	130	277	345	103	210	1361	420	305	1167	798
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	35.5	34.5	34.5	23.5	22.5	22.5	16.0	43.0	23.5	19.0	46.0	35.5
Total Split (%)	29.6%	28.8%	28.8%	19.6%	18.8%	18.8%	13.3%	35.8%	19.6%	15.8%	38.3%	29.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	31.1	31.0	31.0	16.7	16.6	16.6	11.3	37.1	58.3	14.5	40.3	75.8
Actuated g/C Ratio	0.27	0.26	0.26	0.14	0.14	0.14	0.10	0.32	0.50	0.12	0.34	0.65
v/c Ratio	1.09	0.53	0.30	0.73	0.78	0.34	0.81	0.76	0.53	0.92	0.60	0.87
Control Delay	102.5	42.8	15.3	59.0	61.1	7.2	75.1	39.3	11.9	82.3	33.4	27.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.5	42.8	15.3	59.0	61.1	7.2	75.1	39.3	11.9	82.3	33.4	27.2
LOS	F	D	B	E	E	A	E	D	B	F	C	C
Approach Delay		80.5			52.6			37.3			37.8	
Approach LOS		F			D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.3	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 47.3	Intersection LOS: D
Intersection Capacity Utilization 82.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway



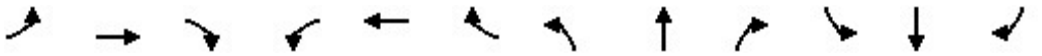


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	837	246	140	298	371	111	226	1463	452	328	1255	858
v/c Ratio	1.09	0.53	0.30	0.73	0.78	0.34	0.81	0.76	0.53	0.92	0.60	0.87
Control Delay	102.5	42.8	15.3	59.0	61.1	7.2	75.1	39.3	11.9	82.3	33.4	27.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.5	42.8	15.3	59.0	61.1	7.2	75.1	39.3	11.9	82.3	33.4	27.2
Queue Length 50th (ft)	~385	166	27	113	146	0	90	293	109	131	231	477
Queue Length 95th (ft)	#510	253	82	161	201	34	#155	338	199	#222	270	#821
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	765	466	466	468	515	345	284	1995	880	358	2151	989
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.09	0.53	0.30	0.64	0.72	0.32	0.80	0.73	0.51	0.92	0.58	0.87

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	778	229	130	277	345	103	210	1361	420	305	1167	798
Future Volume (veh/h)	778	229	130	277	345	103	210	1361	420	305	1167	798
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	837	246	140	298	371	111	226	1463	452	328	1255	858
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	771	489	414	354	446	199	273	1979	670	361	2163	931
Arrive On Green	0.27	0.28	0.28	0.12	0.13	0.13	0.09	0.32	0.32	0.12	0.35	0.35
Sat Flow, veh/h	2910	1772	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	837	246	140	298	371	111	226	1463	452	328	1255	858
Grp Sat Flow(s),veh/h/ln	1455	1772	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	31.0	13.7	8.7	11.7	12.6	8.1	8.9	24.9	27.9	13.0	19.6	41.5
Cycle Q Clear(g_c), s	31.0	13.7	8.7	11.7	12.6	8.1	8.9	24.9	27.9	13.0	19.6	41.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	771	489	414	354	446	199	273	1979	670	361	2163	931
V/C Ratio(X)	1.09	0.50	0.34	0.84	0.83	0.56	0.83	0.74	0.67	0.91	0.58	0.92
Avail Cap(c_a), veh/h	771	489	414	473	518	231	286	2007	677	361	2163	931
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.0	35.6	33.8	50.3	49.5	47.5	52.1	35.1	25.7	50.6	30.6	19.7
Incr Delay (d2), s/veh	57.9	0.8	0.5	10.0	9.8	2.4	17.4	1.5	2.6	26.1	0.4	14.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.2	6.0	3.2	4.8	5.9	3.2	3.9	9.4	10.3	6.0	7.2	22.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	100.9	36.4	34.3	60.3	59.3	50.0	69.5	36.6	28.3	76.7	31.0	33.9
LnGrp LOS	F	D	C	E	E	D	E	D	C	E	C	C
Approach Vol, veh/h		1223			780			2141			2441	
Approach Delay, s/veh		80.3			58.4			38.3			38.2	
Approach LOS		F			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	42.5	18.7	36.8	15.5	46.0	35.5	20.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	38.5	19.0	30.0	11.5	41.5	31.0	18.0
Max Q Clear Time (g_c+I1), s	15.0	29.9	13.7	15.7	10.9	43.5	33.0	14.6
Green Ext Time (p_c), s	0.0	6.6	0.5	1.6	0.0	0.0	0.0	0.9

Intersection Summary	
HCM 6th Ctrl Delay	48.4
HCM 6th LOS	D

Notes

User approved changes to right turn type.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.993	0.850				
Flt Protected	0.955					
Satd. Flow (prot)	3066	1365	0	6071	6071	0
Flt Permitted	0.955					
Satd. Flow (perm)	3066	1365	0	6071	6071	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	5	5				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

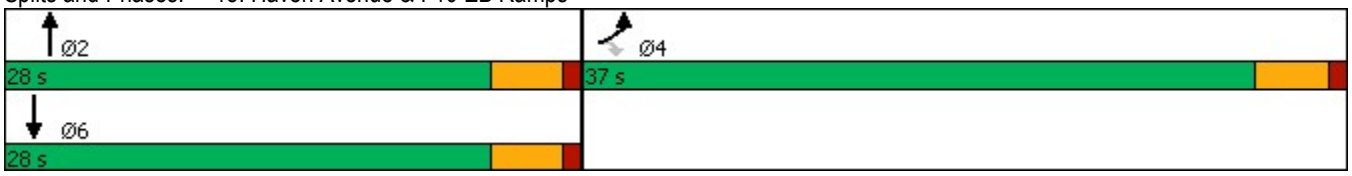
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	1111	541	0	1632	1364	0
Future Volume (vph)	1111	541	0	1632	1364	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1145	558	0	1682	1406	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	1201	502	0	1682	1406	0

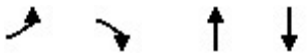
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1111	541	1632	1364
Future Volume (vph)	1111	541	1632	1364
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	37.0	37.0	28.0	28.0
Total Split (%)	56.9%	56.9%	43.1%	43.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	29.2	29.2	23.4	23.4
Actuated g/C Ratio	0.47	0.47	0.38	0.38
v/c Ratio	0.83	0.77	0.73	0.61
Control Delay	19.7	23.1	19.3	17.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	19.7	23.1	19.3	17.4
LOS	B	C	B	B
Approach Delay	20.7		19.3	17.4
Approach LOS	C		B	B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 61.6	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 19.2	Intersection LOS: B
Intersection Capacity Utilization 74.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1201	502	1682	1406
v/c Ratio	0.83	0.77	0.73	0.61
Control Delay	19.7	23.1	19.3	17.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	19.7	23.1	19.3	17.4
Queue Length 50th (ft)	186	159	166	131
Queue Length 95th (ft)	264	#300	208	166
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	1631	727	2331	2331
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.74	0.69	0.72	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1111	541	0	1632	1364	0
Future Volume (veh/h)	1111	541	0	1632	1364	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1772	0	1772	1772	0
Adj Flow Rate, veh/h	1145	558	0	1682	1406	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	1466	690	0	2325	2325	0
Arrive On Green	0.46	0.46	0.00	0.38	0.38	0.00
Sat Flow, veh/h	3188	1502	0	6592	6592	0
Grp Volume(v), veh/h	1145	558	0	1682	1406	0
Grp Sat Flow(s),veh/h/ln	1594	1502	0	1524	1524	0
Q Serve(g_s), s	17.2	18.1	0.0	13.4	10.5	0.0
Cycle Q Clear(g_c), s	17.2	18.1	0.0	13.4	10.5	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	1466	690	0	2325	2325	0
V/C Ratio(X)	0.78	0.81	0.00	0.72	0.60	0.00
Avail Cap(c_a), veh/h	1828	861	0	2528	2528	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.9	13.2	0.0	15.0	14.1	0.0
Incr Delay (d2), s/veh	1.8	4.7	0.0	1.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	5.9	0.0	4.1	3.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.7	17.8	0.0	15.9	14.5	0.0
LnGrp LOS	B	B	A	B	B	A
Approach Vol, veh/h	1703			1682	1406	
Approach Delay, s/veh	15.7			15.9	14.5	
Approach LOS	B			B	B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		26.1		30.6		26.1
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		23.5		32.5		23.5
Max Q Clear Time (g_c+I1), s		15.4		20.1		12.5
Green Ext Time (p_c), s		6.3		6.0		7.0

Intersection Summary	
HCM 6th Ctrl Delay	15.4
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1600	1800	1600	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2891	1500	2891	6071	6071	1500
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2891	1500	2891	6071	6071	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		11				127
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	887	222	158	1154	843	756
Future Volume (vph)	887	222	158	1154	843	756
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	914	229	163	1190	869	779
Shared Lane Traffic (%)						
Lane Group Flow (vph)	914	229	163	1190	869	779

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	887	222	158	1154	843	756
Future Volume (vph)	887	222	158	1154	843	756
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	39.0	12.0	12.0	36.0	24.0	39.0
Total Split (%)	52.0%	16.0%	16.0%	48.0%	32.0%	52.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	27.8	39.8	7.4	28.3	16.3	48.8
Actuated g/C Ratio	0.43	0.61	0.11	0.43	0.25	0.75
v/c Ratio	0.74	0.25	0.50	0.45	0.57	0.68
Control Delay	20.2	6.7	35.9	14.4	23.8	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.2	6.7	35.9	14.4	23.8	6.7
LOS	C	A	D	B	C	A
Approach Delay	17.5			17.0	15.7	
Approach LOS	B			B	B	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 65.4	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 62.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	914	229	163	1190	869	779
v/c Ratio	0.74	0.25	0.50	0.45	0.57	0.68
Control Delay	20.2	6.7	35.9	14.4	23.8	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.2	6.7	35.9	14.4	23.8	6.7
Queue Length 50th (ft)	155	36	34	97	91	89
Queue Length 95th (ft)	230	71	67	140	131	168
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	1565	925	340	3002	1858	1301
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.25	0.48	0.40	0.47	0.60

Intersection Summary

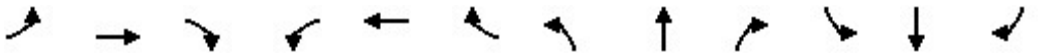
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	887	222	158	1154	843	756
Future Volume (veh/h)	887	222	158	1154	843	756
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1772	1575	1772	1772	1772
Adj Flow Rate, veh/h	914	229	163	1190	869	779
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1113	699	242	2875	1925	1049
Arrive On Green	0.38	0.38	0.08	0.47	0.32	0.32
Sat Flow, veh/h	2910	1502	2910	6343	6343	1502
Grp Volume(v), veh/h	914	229	163	1190	869	779
Grp Sat Flow(s),veh/h/ln	1455	1502	1455	1524	1524	1502
Q Serve(g_s), s	17.5	5.9	3.4	7.9	7.0	19.5
Cycle Q Clear(g_c), s	17.5	5.9	3.4	7.9	7.0	19.5
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1113	699	242	2875	1925	1049
V/C Ratio(X)	0.82	0.33	0.67	0.41	0.45	0.74
Avail Cap(c_a), veh/h	1626	964	353	3110	1925	1049
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.2	10.4	27.5	10.7	16.9	5.8
Incr Delay (d2), s/veh	2.3	0.3	3.3	0.1	0.2	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.1	1.2	2.3	2.3	11.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.4	10.7	30.8	10.8	17.0	8.6
LnGrp LOS	B	B	C	B	B	A
Approach Vol, veh/h	1143			1353	1648	
Approach Delay, s/veh	17.7			13.2	13.1	
Approach LOS	B			B	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		33.6		28.1	9.6	24.0
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		31.5		34.5	7.5	19.5
Max Q Clear Time (g_c+I1), s		9.9		19.5	5.4	21.5
Green Ext Time (p_c), s		9.1		4.2	0.1	0.0

Intersection Summary		
HCM 6th Ctrl Delay		14.4
HCM 6th LOS		B

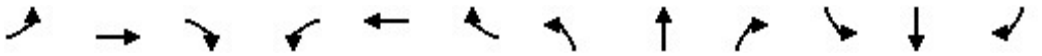
Appendix G

Intersection LOS Analysis Sheets
Opening Year With Related Projects With Project Conditions



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.954				0.850			0.850		0.994	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4596	0	2891	3353	1500	2891	4818	1500	2891	6034	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4596	0	2891	3353	1500	2891	4818	1500	2891	6034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		89				149			238		8	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



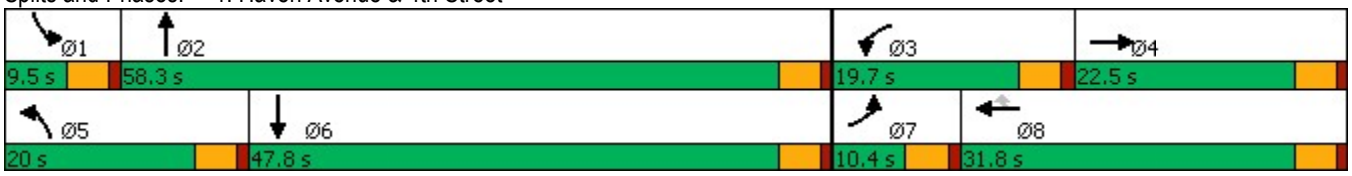
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	93	313	140	315	555	199	244	1666	513	114	1363	55
Future Volume (vph)	93	313	140	315	555	199	244	1666	513	114	1363	55
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	102	344	154	346	610	219	268	1831	564	125	1498	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	102	498	0	346	610	219	268	1831	564	125	1558	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	93	313	315	555	199	244	1666	513	114	1363
Future Volume (vph)	93	313	315	555	199	244	1666	513	114	1363
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	10.4	22.5	19.7	31.8	31.8	20.0	58.3		9.5	47.8
Total Split (%)	9.5%	20.5%	17.9%	28.9%	28.9%	18.2%	53.0%		8.6%	43.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	5.9	15.8	14.9	24.8	24.8	14.0	53.8	107.6	5.0	44.9
Actuated g/C Ratio	0.05	0.15	0.14	0.23	0.23	0.13	0.50	1.00	0.05	0.42
v/c Ratio	0.65	0.66	0.86	0.79	0.48	0.71	0.76	0.38	0.93	0.62
Control Delay	69.7	39.9	67.8	47.0	15.8	56.3	24.6	0.7	114.4	26.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.7	39.9	67.8	47.0	15.8	56.3	24.6	0.7	114.4	26.5
LOS	E	D	E	D	B	E	C	A	F	C
Approach Delay		45.0		47.3			22.8			33.0
Approach LOS		D		D			C			C

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 107.6	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 32.5	Intersection LOS: C
Intersection Capacity Utilization 73.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Haven Avenue & 4th Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	102	498	346	610	219	268	1831	564	125	1558
v/c Ratio	0.65	0.66	0.86	0.79	0.48	0.71	0.76	0.38	0.93	0.62
Control Delay	69.7	39.9	67.8	47.0	15.8	56.3	24.6	0.7	114.4	26.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.7	39.9	67.8	47.0	15.8	56.3	24.6	0.7	114.4	26.5
Queue Length 50th (ft)	37	98	124	208	39	93	377	0	46	255
Queue Length 95th (ft)	#75	137	#204	274	110	138	440	0	#107	297
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	158	843	408	851	492	416	2410	1500	134	2520
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.59	0.85	0.72	0.45	0.64	0.76	0.38	0.93	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

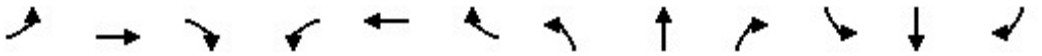
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	313	140	315	555	199	244	1666	513	114	1363	55
Future Volume (veh/h)	93	313	140	315	555	199	244	1666	513	114	1363	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	102	344	154	346	610	219	268	1831	0	125	1498	60
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	148	460	194	397	753	336	326	2459		137	2686	107
Arrive On Green	0.05	0.14	0.14	0.14	0.22	0.22	0.11	0.51	0.00	0.05	0.44	0.44
Sat Flow, veh/h	2910	3339	1405	2910	3367	1502	2910	4837	1502	2910	6057	242
Grp Volume(v), veh/h	102	332	166	346	610	219	268	1831	0	125	1130	428
Grp Sat Flow(s),veh/h/ln	1455	1612	1519	1455	1683	1502	1455	1612	1502	1455	1524	1728
Q Serve(g_s), s	3.6	10.5	11.2	12.3	18.2	14.0	9.5	31.7	0.0	4.5	19.4	19.4
Cycle Q Clear(g_c), s	3.6	10.5	11.2	12.3	18.2	14.0	9.5	31.7	0.0	4.5	19.4	19.4
Prop In Lane	1.00		0.93	1.00		1.00	1.00		1.00	1.00		0.14
Lane Grp Cap(c), veh/h	148	445	209	397	753	336	326	2459		137	2027	766
V/C Ratio(X)	0.69	0.75	0.80	0.87	0.81	0.65	0.82	0.74		0.91	0.56	0.56
Avail Cap(c_a), veh/h	162	548	258	418	868	387	426	2459		137	2027	766
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.4	43.8	44.2	44.8	39.0	37.3	46.0	20.6	0.0	50.2	21.8	21.8
Incr Delay (d2), s/veh	10.6	4.3	12.9	17.2	5.1	3.1	9.5	2.1	0.0	50.4	1.1	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	4.4	5.0	5.4	8.0	5.4	3.9	11.8	0.0	2.6	7.0	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.0	48.2	57.1	62.0	44.1	40.5	55.4	22.7	0.0	100.6	22.9	24.7
LnGrp LOS	E	D	E	E	D	D	E	C		F	C	C
Approach Vol, veh/h		600			1175			2099	A		1683	
Approach Delay, s/veh		52.7			48.7			26.9			29.1	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	58.3	19.0	19.1	16.4	51.4	9.9	28.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	53.8	15.2	18.0	15.5	43.3	5.9	27.3
Max Q Clear Time (g_c+I1), s	6.5	33.7	14.3	13.2	11.5	21.4	5.6	20.2
Green Ext Time (p_c), s	0.0	13.7	0.1	1.4	0.3	11.7	0.0	2.8

Intersection Summary	
HCM 6th Ctrl Delay	35.0
HCM 6th LOS	C

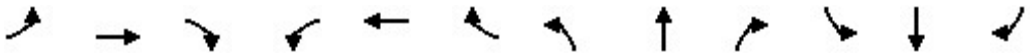
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.989				0.850			0.850		0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	6004	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	6004	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22				164			164		320	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	38	544	41	1	815	109	43	1	1	176	0	3
Future Volume (vph)	38	544	41	1	815	109	43	1	1	176	0	3
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	42	604	46	1	906	121	48	1	1	196	0	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	650	0	1	906	121	48	1	1	196	3	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	38	544	1	815	109	43	1	1	176	0
Future Volume (vph)	38	544	1	815	109	43	1	1	176	0
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			2		
Detector Phase	7	4	3	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5
Total Split (s)	9.5	22.5	9.5	22.5	22.5	11.3	23.0	23.0	15.0	26.7
Total Split (%)	13.6%	32.1%	13.6%	32.1%	32.1%	16.1%	32.9%	32.9%	21.4%	38.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	5.1	17.8	5.1	16.2	16.2	6.5	5.7	5.7	10.3	16.6
Actuated g/C Ratio	0.10	0.36	0.10	0.33	0.33	0.13	0.12	0.12	0.21	0.34
v/c Ratio	0.26	0.30	0.01	0.57	0.20	0.23	0.00	0.00	0.60	0.00
Control Delay	27.6	11.5	24.0	15.9	2.5	24.8	23.0	0.0	29.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.6	11.5	24.0	15.9	2.5	24.8	23.0	0.0	29.7	0.0
LOS	C	B	C	B	A	C	C	A	C	A
Approach Delay		12.5		14.4			24.3			29.3
Approach LOS		B		B			C			C

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 49.2	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 15.5	Intersection LOS: B
Intersection Capacity Utilization 49.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	42	650	1	906	121	48	1	1	196	3
v/c Ratio	0.26	0.30	0.01	0.57	0.20	0.23	0.00	0.00	0.60	0.00
Control Delay	27.6	11.5	24.0	15.9	2.5	24.8	23.0	0.0	29.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.6	11.5	24.0	15.9	2.5	24.8	23.0	0.0	29.7	0.0
Queue Length 50th (ft)	11	33	0	66	0	12	0	0	48	0
Queue Length 95th (ft)	40	67	4	130	18	42	4	0	#145	0
Internal Link Dist (ft)		2546		362			269			358
Turn Bay Length (ft)	130		130		145	165		165	50	
Base Capacity (vph)	164	2455	164	1799	663	223	677	676	345	1485
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.26	0.01	0.50	0.18	0.22	0.00	0.00	0.57	0.00

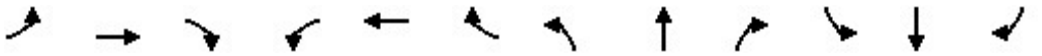
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	544	41	1	815	109	43	1	1	176	0	3
Future Volume (veh/h)	38	544	41	1	815	109	43	1	1	176	0	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	42	604	46	1	906	121	48	1	1	196	0	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	72	1994	150	3	1443	448	80	194	165	243	357	318
Arrive On Green	0.05	0.34	0.34	0.00	0.30	0.30	0.05	0.11	0.11	0.15	0.00	0.21
Sat Flow, veh/h	1594	5828	437	1594	4837	1502	1594	1772	1502	1594	1683	1502
Grp Volume(v), veh/h	42	472	178	1	906	121	48	1	1	196	0	3
Grp Sat Flow(s),veh/h/ln	1594	1524	1693	1594	1612	1502	1594	1772	1502	1594	1683	1502
Q Serve(g_s), s	1.2	3.5	3.5	0.0	7.4	2.8	1.3	0.0	0.0	5.4	0.0	0.1
Cycle Q Clear(g_c), s	1.2	3.5	3.5	0.0	7.4	2.8	1.3	0.0	0.0	5.4	0.0	0.1
Prop In Lane	1.00		0.26	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	72	1564	579	3	1443	448	80	194	165	243	357	318
V/C Ratio(X)	0.58	0.30	0.31	0.29	0.63	0.27	0.60	0.01	0.01	0.81	0.00	0.01
Avail Cap(c_a), veh/h	175	1804	668	175	1909	593	238	719	609	367	819	731
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.4	11.0	11.0	22.7	13.8	12.2	21.2	18.1	18.1	18.7	0.0	14.2
Incr Delay (d2), s/veh	7.2	0.1	0.3	39.7	0.5	0.3	7.1	0.0	0.0	7.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.0	1.1	0.0	2.3	0.8	0.6	0.0	0.0	2.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.6	11.1	11.3	62.5	14.3	12.5	28.4	18.1	18.1	26.4	0.0	14.2
LnGrp LOS	C	B	B	E	B	B	C	B	B	C	A	B
Approach Vol, veh/h		692			1028			50			199	
Approach Delay, s/veh		12.2			14.1			28.0			26.2	
Approach LOS		B			B			C			C	

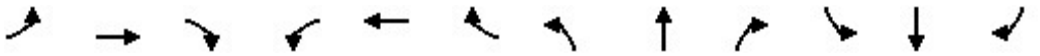
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.4	9.5	4.6	20.1	6.8	14.2	6.6	18.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	18.5	5.0	18.0	6.8	22.2	5.0	18.0
Max Q Clear Time (g_c+I1), s	7.4	2.0	2.0	5.5	3.3	2.1	3.2	9.4
Green Ext Time (p_c), s	0.2	0.0	0.0	3.4	0.0	0.0	0.0	4.2

Intersection Summary	
HCM 6th Ctrl Delay	15.0
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.997				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.956	
Satd. Flow (prot)	2891	6065	0	1583	4803	0	1583	1765	1500	0	1687	1500
Flt Permitted	0.950			0.950			0.731				0.740	
Satd. Flow (perm)	2891	6065	0	1583	4803	0	1218	1765	1500	0	1306	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			6				109			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



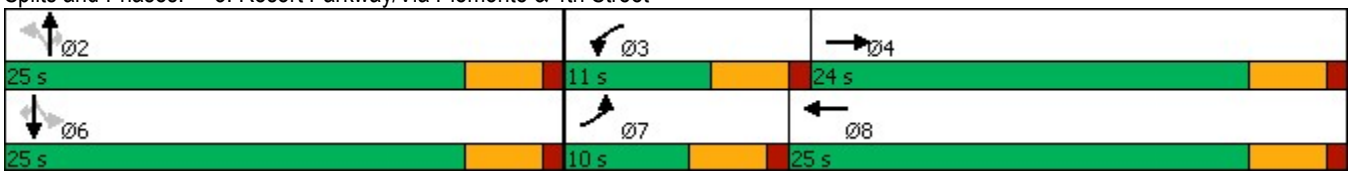
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	15	716	4	36	867	20	28	3	31	34	3	17
Future Volume (vph)	15	716	4	36	867	20	28	3	31	34	3	17
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	16	770	4	39	932	22	30	3	33	37	3	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	774	0	39	954	0	30	3	33	0	40	18

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	15	716	36	867	28	3	31	34	3	17
Future Volume (vph)	15	716	36	867	28	3	31	34	3	17
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8		2			6	
Permitted Phases					2		2	6		6
Detector Phase	7	4	3	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	10.0	24.0	11.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (%)	16.7%	40.0%	18.3%	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	5.8	14.4	6.4	14.5	6.8	6.8	6.8		6.8	6.8
Actuated g/C Ratio	0.18	0.45	0.20	0.45	0.21	0.21	0.21		0.21	0.21
v/c Ratio	0.03	0.29	0.12	0.44	0.12	0.01	0.08		0.14	0.04
Control Delay	15.5	6.5	15.3	7.2	14.5	13.7	0.4		14.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	15.5	6.5	15.3	7.2	14.5	13.7	0.4		14.6	0.2
LOS	B	A	B	A	B	B	A		B	A
Approach Delay		6.7		7.6		7.4			10.2	
Approach LOS		A		A		A			B	

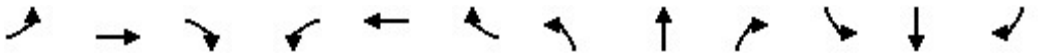
Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 32.2	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 7.3	Intersection LOS: A
Intersection Capacity Utilization 42.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	16	774	39	954	30	3	33	40	18
v/c Ratio	0.03	0.29	0.12	0.44	0.12	0.01	0.08	0.14	0.04
Control Delay	15.5	6.5	15.3	7.2	14.5	13.7	0.4	14.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.5	6.5	15.3	7.2	14.5	13.7	0.4	14.6	0.2
Queue Length 50th (ft)	1	16	5	28	4	0	0	5	0
Queue Length 95th (ft)	8	58	31	93	25	6	0	30	0
Internal Link Dist (ft)		362		428		302		378	
Turn Bay Length (ft)	220		125		115		115		110
Base Capacity (vph)	521	3883	337	3234	820	1187	1045	878	1045
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.20	0.12	0.29	0.04	0.00	0.03	0.05	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	716	4	36	867	20	28	3	31	34	3	17
Future Volume (veh/h)	15	716	4	36	867	20	28	3	31	34	3	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	16	770	4	39	932	22	30	3	33	37	3	18
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	60	2261	12	73	1866	44	412	285	242	424	26	242
Arrive On Green	0.02	0.36	0.36	0.05	0.38	0.38	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	2910	6305	33	1594	4862	115	1314	1772	1502	1249	159	1502
Grp Volume(v), veh/h	16	558	216	39	618	336	30	3	33	40	0	18
Grp Sat Flow(s),veh/h/ln	1455	1524	1766	1594	1612	1751	1314	1772	1502	1408	0	1502
Q Serve(g_s), s	0.2	2.8	2.8	0.7	4.5	4.5	0.6	0.0	0.6	0.6	0.0	0.3
Cycle Q Clear(g_c), s	0.2	2.8	2.8	0.7	4.5	4.5	1.4	0.0	0.6	0.7	0.0	0.3
Prop In Lane	1.00		0.02	1.00		0.07	1.00		1.00	0.92		1.00
Lane Grp Cap(c), veh/h	60	1640	633	73	1238	672	412	285	242	450	0	242
V/C Ratio(X)	0.26	0.34	0.34	0.53	0.50	0.50	0.07	0.01	0.14	0.09	0.00	0.07
Avail Cap(c_a), veh/h	515	2869	1108	333	2127	1155	1068	1169	991	1146	0	991
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.0	7.3	7.3	14.5	7.3	7.3	11.8	11.0	11.2	11.2	0.0	11.1
Incr Delay (d2), s/veh	2.3	0.1	0.3	5.9	0.3	0.6	0.1	0.0	0.3	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.6	0.7	0.3	1.0	1.1	0.1	0.0	0.2	0.2	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.3	7.4	7.6	20.4	7.6	7.9	11.9	11.0	11.4	11.3	0.0	11.2
LnGrp LOS	B	A	A	C	A	A	B	B	B	B	A	B
Approach Vol, veh/h		790			993			66			58	
Approach Delay, s/veh		7.7			8.2			11.6			11.3	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	5.9	15.6		9.5	5.1	16.4				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		20.5	6.5	19.5		20.5	5.5	20.5				
Max Q Clear Time (g_c+I1), s		3.4	2.7	4.8		2.7	2.2	6.5				
Green Ext Time (p_c), s		0.1	0.0	4.5		0.2	0.0	5.4				

Intersection Summary	
HCM 6th Ctrl Delay	8.2
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.996					0.865
Flt Protected						
Satd. Flow (prot)	4798	0	0	4818	0	1526
Flt Permitted						
Satd. Flow (perm)	4798	0	0	4818	0	1526
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	774	21	0	880	0	23
Future Volume (vph)	774	21	0	880	0	23
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	841	23	0	957	0	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	864	0	0	957	0	25

Intersection Summary

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	774	21	0	880	0	23
Future Vol, veh/h	774	21	0	880	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	841	23	0	957	0	25

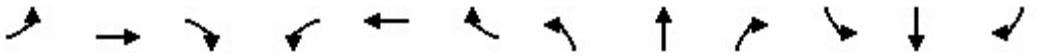
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	432
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	489
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	489
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	489	-	-	-
HCM Lane V/C Ratio	0.051	-	-	-
HCM Control Delay (s)	12.8	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.986	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5986	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5986	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			239			285			73		24	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



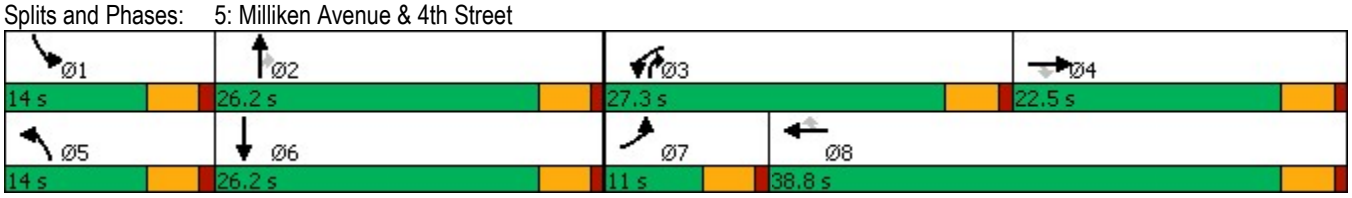
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	154	555	226	471	1318	407	236	1013	164	248	961	97
Future Volume (vph)	154	555	226	471	1318	407	236	1013	164	248	961	97
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	166	597	243	506	1417	438	254	1089	176	267	1033	104
Shared Lane Traffic (%)												
Lane Group Flow (vph)	166	597	243	506	1417	438	254	1089	176	267	1137	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	154	555	226	471	1318	407	236	1013	164	248	961
Future Volume (vph)	154	555	226	471	1318	407	236	1013	164	248	961
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	11.0	22.5	22.5	27.3	38.8	38.8	14.0	26.2	27.3	14.0	26.2
Total Split (%)	12.2%	25.0%	25.0%	30.3%	43.1%	43.1%	15.6%	29.1%	30.3%	15.6%	29.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	6.5	20.4	20.4	20.0	33.9	33.9	9.5	21.3	45.8	9.5	21.3
Actuated g/C Ratio	0.07	0.23	0.23	0.22	0.38	0.38	0.11	0.24	0.51	0.11	0.24
v/c Ratio	0.79	0.54	0.46	0.78	0.77	0.59	0.82	0.75	0.22	0.87	0.79
Control Delay	68.0	33.1	7.8	41.7	27.9	11.1	62.3	35.4	7.1	67.6	35.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.0	33.1	7.8	41.7	27.9	11.1	62.3	35.4	7.1	67.6	35.7
LOS	E	C	A	D	C	B	E	D	A	E	D
Approach Delay		32.8			27.7			36.6			41.8
Approach LOS		C			C			D			D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 89.2	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 33.8	Intersection LOS: C
Intersection Capacity Utilization 71.5%	ICU Level of Service C
Analysis Period (min) 15	

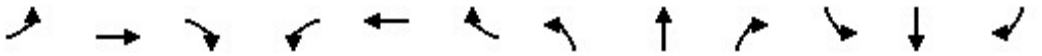
Splits and Phases: 5: Milliken Avenue & 4th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	166	597	243	506	1417	438	254	1089	176	267	1137
v/c Ratio	0.79	0.54	0.46	0.78	0.77	0.59	0.82	0.75	0.22	0.87	0.79
Control Delay	68.0	33.1	7.8	41.7	27.9	11.1	62.3	35.4	7.1	67.6	35.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.0	33.1	7.8	41.7	27.9	11.1	62.3	35.4	7.1	67.6	35.7
Queue Length 50th (ft)	48	110	2	138	253	59	74	166	28	78	172
Queue Length 95th (ft)	#102	153	63	189	311	154	#138	206	59	#147	212
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	210	1104	528	738	1852	752	308	1476	850	308	1474
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.54	0.46	0.69	0.77	0.58	0.82	0.74	0.21	0.87	0.77

Intersection Summary

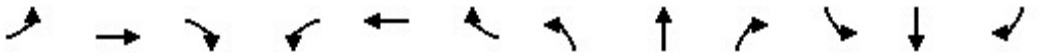
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	154	555	226	471	1318	407	236	1013	164	248	961	97
Future Volume (veh/h)	154	555	226	471	1318	407	236	1013	164	248	961	97
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	166	597	243	506	1417	438	254	1089	176	267	1033	104
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	222	1174	364	593	1792	556	316	1410	654	324	1328	133
Arrive On Green	0.08	0.24	0.24	0.20	0.37	0.37	0.11	0.23	0.23	0.11	0.23	0.23
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	2910	6095	1502	2910	5675	567
Grp Volume(v), veh/h	166	597	243	506	1417	438	254	1089	176	267	831	306
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1455	1524	1502	1455	1524	1670
Q Serve(g_s), s	4.8	9.1	12.5	14.3	22.3	22.1	7.3	14.3	6.4	7.7	14.5	14.7
Cycle Q Clear(g_c), s	4.8	9.1	12.5	14.3	22.3	22.1	7.3	14.3	6.4	7.7	14.5	14.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	222	1174	364	593	1792	556	316	1410	654	324	1070	391
V/C Ratio(X)	0.75	0.51	0.67	0.85	0.79	0.79	0.80	0.77	0.27	0.82	0.78	0.78
Avail Cap(c_a), veh/h	222	1174	364	777	1943	603	324	1549	688	324	1162	424
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.6	27.9	29.2	32.8	23.9	23.9	37.2	30.7	15.4	37.1	30.6	30.7
Incr Delay (d2), s/veh	13.2	0.4	4.6	7.2	2.1	6.4	13.4	2.3	0.2	15.8	3.1	8.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	3.5	4.8	5.5	8.4	8.4	3.1	5.3	2.1	3.4	5.5	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.8	28.3	33.8	39.9	26.1	30.3	50.5	33.0	15.6	52.9	33.7	39.3
LnGrp LOS	D	C	C	D	C	C	D	C	B	D	C	D
Approach Vol, veh/h		1006			2361			1519			1404	
Approach Delay, s/veh		33.5			29.8			33.9			38.6	
Approach LOS		C			C			C			D	

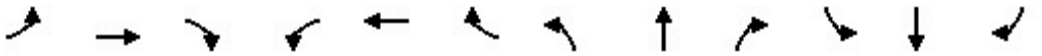
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	24.3	21.9	25.2	13.8	24.5	11.0	36.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	21.7	22.8	18.0	9.5	21.7	6.5	34.3
Max Q Clear Time (g_c+I1), s	9.7	16.3	16.3	14.5	9.3	16.7	6.8	24.3
Green Ext Time (p_c), s	0.0	3.5	1.1	1.6	0.0	3.1	0.0	7.4

Intersection Summary	
HCM 6th Ctrl Delay	33.4
HCM 6th LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.898	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2884	1365
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2884	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136			136			136		214	214
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



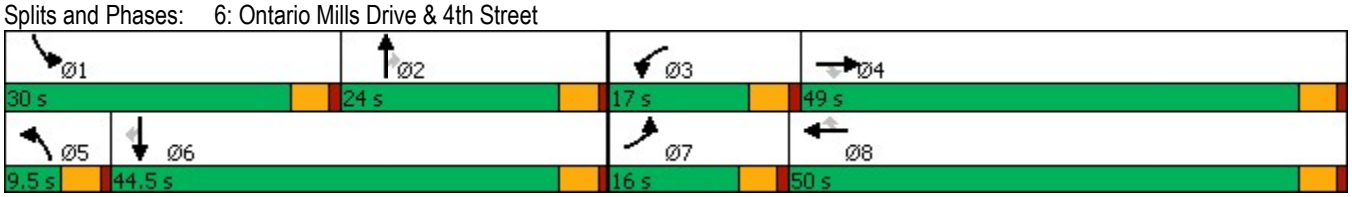
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	336	519	59	124	1381	172	72	71	86	194	223	942
Future Volume (vph)	336	519	59	124	1381	172	72	71	86	194	223	942
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	386	597	68	143	1587	198	83	82	99	223	256	1083
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	386	597	68	143	1587	198	83	82	99	223	798	541

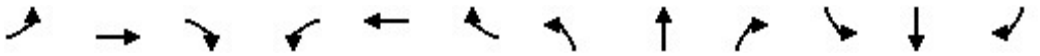
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	336	519	59	124	1381	172	72	71	86	194	223	942
Future Volume (vph)	336	519	59	124	1381	172	72	71	86	194	223	942
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	16.0	49.0	49.0	17.0	50.0	50.0	9.5	24.0	24.0	30.0	44.5	44.5
Total Split (%)	13.3%	40.8%	40.8%	14.2%	41.7%	41.7%	7.9%	20.0%	20.0%	25.0%	37.1%	37.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	11.6	45.3	45.3	10.7	44.4	44.4	5.0	21.6	21.6	20.8	37.4	37.4
Actuated g/C Ratio	0.10	0.39	0.39	0.09	0.38	0.38	0.04	0.19	0.19	0.18	0.32	0.32
v/c Ratio	1.35	0.32	0.10	0.54	0.86	0.30	1.24	0.13	0.25	0.79	0.90dr	0.93
Control Delay	218.5	26.1	0.3	59.1	39.6	10.1	231.4	42.2	4.5	66.0	30.2	46.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	218.5	26.1	0.3	59.1	39.6	10.1	231.4	42.2	4.5	66.0	30.2	46.8
LOS	F	C	A	E	D	B	F	D	A	E	C	D
Approach Delay		95.1			38.0			87.5			41.1	
Approach LOS		F			D			F			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 116.5	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.35	
Intersection Signal Delay: 54.2	Intersection LOS: D
Intersection Capacity Utilization 84.9%	ICU Level of Service E
Analysis Period (min) 15	
dr Defacto Right Lane. Recode with 1 though lane as a right lane.	

Splits and Phases: 6: Ontario Mills Drive & 4th Street





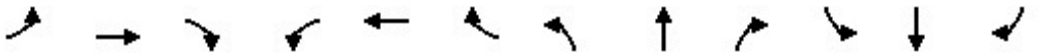
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	386	597	68	143	1587	198	83	82	99	223	798	541
v/c Ratio	1.35	0.32	0.10	0.54	0.86	0.30	1.24	0.13	0.25	0.79	0.90dr	0.93
Control Delay	218.5	26.1	0.3	59.1	39.6	10.1	231.4	42.2	4.5	66.0	30.2	46.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	218.5	26.1	0.3	59.1	39.6	10.1	231.4	42.2	4.5	66.0	30.2	46.8
Queue Length 50th (ft)	~205	118	0	55	412	31	~81	27	0	166	220	290
Queue Length 95th (ft)	#292	147	0	85	454	79	#179	51	19	238	283	#498
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	286	1879	668	311	1889	671	67	623	389	348	1135	610
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.35	0.32	0.10	0.46	0.84	0.30	1.24	0.13	0.25	0.64	0.70	0.89

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



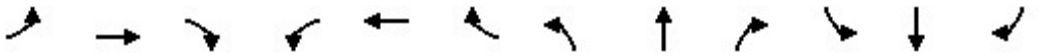
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	336	519	59	124	1381	172	72	71	86	194	223	942
Future Volume (veh/h)	336	519	59	124	1381	172	72	71	86	194	223	942
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	386	597	68	143	1587	198	83	82	99	223	256	1083
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	283	1946	604	192	1795	557	67	750	335	250	598	1014
Arrive On Green	0.10	0.40	0.40	0.07	0.37	0.37	0.04	0.22	0.22	0.16	0.34	0.34
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	1594	3367	1502	1594	1772	3003
Grp Volume(v), veh/h	386	597	68	143	1587	198	83	82	99	223	256	1083
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1594	1683	1502	1594	1772	1502
Q Serve(g_s), s	11.5	10.0	3.4	5.7	36.4	11.3	5.0	2.3	6.5	16.2	13.2	40.0
Cycle Q Clear(g_c), s	11.5	10.0	3.4	5.7	36.4	11.3	5.0	2.3	6.5	16.2	13.2	40.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	283	1946	604	192	1795	557	67	750	335	250	598	1014
V/C Ratio(X)	1.37	0.31	0.11	0.75	0.88	0.36	1.23	0.11	0.30	0.89	0.43	1.07
Avail Cap(c_a), veh/h	283	1946	604	307	1858	577	67	750	335	343	598	1014
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.5	24.1	22.2	54.3	34.9	27.0	56.7	36.7	38.3	48.9	30.4	39.2
Incr Delay (d2), s/veh	185.9	0.1	0.1	5.7	5.4	0.4	185.3	0.1	0.5	19.1	0.5	48.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.5	3.8	1.2	2.2	14.9	4.1	5.5	1.0	2.4	7.8	5.7	21.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	239.4	24.2	22.3	60.0	40.2	27.4	242.1	36.7	38.8	68.1	30.9	87.5
LnGrp LOS	F	C	C	E	D	C	F	D	D	E	C	F
Approach Vol, veh/h		1051			1928			264			1562	
Approach Delay, s/veh		103.1			40.4			102.1			75.4	
Approach LOS		F			D			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.1	30.9	12.3	52.1	9.5	44.5	16.0	48.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	25.5	19.5	12.5	44.5	5.0	40.0	11.5	45.5
Max Q Clear Time (g_c+I1), s	18.2	8.5	7.7	12.0	7.0	42.0	13.5	38.4
Green Ext Time (p_c), s	0.4	0.5	0.2	4.8	0.0	0.0	0.0	5.6

Intersection Summary	
HCM 6th Ctrl Delay	68.9
HCM 6th LOS	E

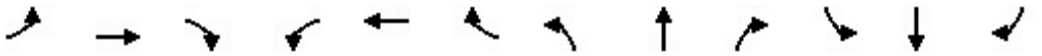
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.983			0.898				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.964	
Satd. Flow (prot)	2891	4818	1500	1583	4736	0	1583	3011	0	1504	1616	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.964	
Satd. Flow (perm)	2891	4818	1500	1583	4736	0	1583	3011	0	1504	1616	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127		25			60				404
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



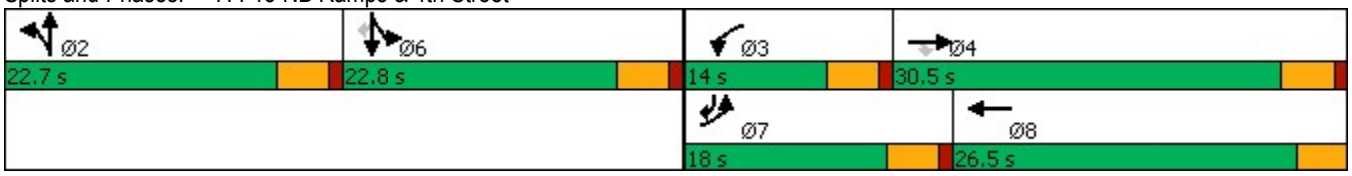
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	303	423	107	45	567	74	132	27	57	489	74	976
Future Volume (vph)	303	423	107	45	567	74	132	27	57	489	74	976
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	319	445	113	47	597	78	139	28	60	515	78	1027
Shared Lane Traffic (%)										43%		
Lane Group Flow (vph)	319	445	113	47	675	0	139	88	0	294	299	1027

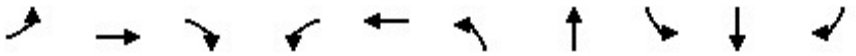
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	303	423	107	45	567	132	27	489	74	976
Future Volume (vph)	303	423	107	45	567	132	27	489	74	976
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	18.0	30.5	30.5	14.0	26.5	22.7	22.7	22.8	22.8	18.0
Total Split (%)	20.0%	33.9%	33.9%	15.6%	29.4%	25.2%	25.2%	25.3%	25.3%	20.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	12.9	26.2	26.2	7.6	17.1	12.1	12.1	18.4	18.4	35.9
Actuated g/C Ratio	0.17	0.34	0.34	0.10	0.22	0.16	0.16	0.24	0.24	0.46
v/c Ratio	0.66	0.27	0.19	0.31	0.64	0.56	0.17	0.83	0.78	0.72
Control Delay	39.8	21.5	4.8	40.7	29.8	40.6	13.9	52.2	46.7	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	21.5	4.8	40.7	29.8	40.6	13.9	52.2	46.7	14.2
LOS	D	C	A	D	C	D	B	D	D	B
Approach Delay		26.0			30.5		30.3		27.1	
Approach LOS		C			C		C		C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 77.8	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 27.7	Intersection LOS: C
Intersection Capacity Utilization 68.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street

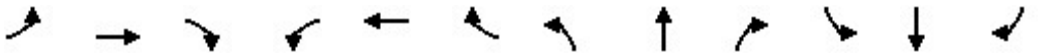




Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	319	445	113	47	675	139	88	294	299	1027
v/c Ratio	0.66	0.27	0.19	0.31	0.64	0.56	0.17	0.83	0.78	0.72
Control Delay	39.8	21.5	4.8	40.7	29.8	40.6	13.9	52.2	46.7	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	21.5	4.8	40.7	29.8	40.6	13.9	52.2	46.7	14.2
Queue Length 50th (ft)	75	62	0	22	105	64	6	145	146	130
Queue Length 95th (ft)	#146	100	32	59	155	127	26	#342	#335	269
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	508	1709	614	196	1436	375	759	358	385	1457
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.26	0.18	0.24	0.47	0.37	0.12	0.82	0.78	0.70

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



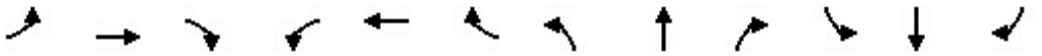
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	303	423	107	45	567	74	132	27	57	489	74	976
Future Volume (veh/h)	303	423	107	45	567	74	132	27	57	489	74	976
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	319	445	113	47	597	78	139	28	60	571	0	1027
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	411	1482	460	69	903	117	194	205	183	849	0	1224
Arrive On Green	0.14	0.31	0.31	0.04	0.21	0.21	0.12	0.12	0.12	0.27	0.00	0.27
Sat Flow, veh/h	2910	4837	1502	1594	4336	560	1594	1683	1502	3188	0	3003
Grp Volume(v), veh/h	319	445	113	47	442	233	139	28	60	571	0	1027
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1594	1612	1671	1594	1683	1502	1594	0	1502
Q Serve(g_s), s	7.3	4.8	3.9	2.0	8.6	8.8	5.8	1.0	2.5	11.0	0.0	18.3
Cycle Q Clear(g_c), s	7.3	4.8	3.9	2.0	8.6	8.8	5.8	1.0	2.5	11.0	0.0	18.3
Prop In Lane	1.00		1.00	1.00		0.33	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	411	1482	460	69	672	348	194	205	183	849	0	1224
V/C Ratio(X)	0.78	0.30	0.25	0.68	0.66	0.67	0.72	0.14	0.33	0.67	0.00	0.84
Avail Cap(c_a), veh/h	572	1832	569	220	1080	560	422	446	398	849	0	1224
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.4	18.2	17.9	32.4	24.9	25.0	29.0	26.9	27.6	22.5	0.0	18.3
Incr Delay (d2), s/veh	4.5	0.1	0.3	11.4	1.1	2.2	4.8	0.3	1.0	2.1	0.0	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	1.7	1.3	1.0	3.2	3.5	2.4	0.4	0.9	4.1	0.0	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.9	18.3	18.1	43.7	26.0	27.2	33.8	27.2	28.6	24.6	0.0	23.6
LnGrp LOS	C	B	B	D	C	C	C	C	C	C	A	C
Approach Vol, veh/h		877			722			227			1598	
Approach Delay, s/veh		23.6			27.6			31.6			24.0	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		12.9	7.5	25.5		22.8	14.2	18.8				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		18.2	9.5	26.0		18.3	13.5	* 23				
Max Q Clear Time (g_c+I1), s		7.8	4.0	6.8		20.3	9.3	10.8				
Green Ext Time (p_c), s		0.6	0.0	3.3		0.0	0.5	3.5				

Intersection Summary	
HCM 6th Ctrl Delay	25.1
HCM 6th LOS	C

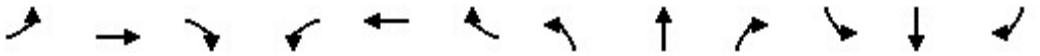
Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
User approved changes to right turn type.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.904				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3031	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3031	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		90				182			182			182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



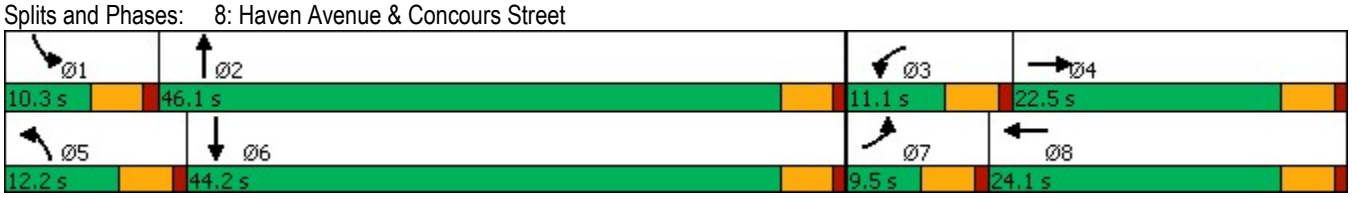
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	21	45	81	180	59	18	71	1972	164	139	1570	44
Future Volume (vph)	21	45	81	180	59	18	71	1972	164	139	1570	44
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	23	50	90	200	66	20	79	2191	182	154	1744	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	140	0	200	66	20	79	2191	182	154	1744	49

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	21	45	180	59	18	71	1972	164	139	1570	44
Future Volume (vph)	21	45	180	59	18	71	1972	164	139	1570	44
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	11.1	24.1		12.2	46.1		10.3	44.2	
Total Split (%)	10.6%	25.0%	12.3%	26.8%		13.6%	51.2%		11.4%	49.1%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.0	7.0	6.6	14.4	79.0	7.0	41.6	79.0	5.8	42.4	79.0
Actuated g/C Ratio	0.06	0.09	0.08	0.18	1.00	0.09	0.53	1.00	0.07	0.54	1.00
v/c Ratio	0.13	0.40	0.61	0.11	0.01	0.31	0.69	0.12	0.73	0.53	0.03
Control Delay	37.2	17.9	43.8	29.8	0.0	37.2	15.4	0.2	57.4	13.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.2	17.9	43.8	29.8	0.0	37.2	15.4	0.2	57.4	13.5	0.0
LOS	D	B	D	C	A	D	B	A	E	B	A
Approach Delay		20.6		37.5			15.0			16.6	
Approach LOS		C		D			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 79	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 17.1	Intersection LOS: B
Intersection Capacity Utilization 58.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	23	140	200	66	20	79	2191	182	154	1744	49
v/c Ratio	0.13	0.40	0.61	0.11	0.01	0.31	0.69	0.12	0.73	0.53	0.03
Control Delay	37.2	17.9	43.8	29.8	0.0	37.2	15.4	0.2	57.4	13.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.2	17.9	43.8	29.8	0.0	37.2	15.4	0.2	57.4	13.5	0.0
Queue Length 50th (ft)	5	12	34	13	0	19	215	0	39	162	0
Queue Length 95th (ft)	17	38	#58	34	0	40	276	0	#87	211	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	183	760	329	832	1500	281	3197	1500	212	3261	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.18	0.61	0.08	0.01	0.28	0.69	0.12	0.73	0.53	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	45	81	180	59	18	71	1972	164	139	1570	44
Future Volume (veh/h)	21	45	81	180	59	18	71	1972	164	139	1570	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	23	50	90	200	66	0	79	2191	0	154	1744	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	74	154	137	301	477		158	3124		220	3252	
Arrive On Green	0.03	0.09	0.09	0.08	0.14	0.00	0.05	0.51	0.00	0.08	0.53	0.00
Sat Flow, veh/h	2910	1683	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	23	50	90	200	66	0	79	2191	0	154	1744	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	0.6	2.0	4.3	3.6	1.3	0.0	1.9	20.1	0.0	3.8	13.7	0.0
Cycle Q Clear(g_c), s	0.6	2.0	4.3	3.6	1.3	0.0	1.9	20.1	0.0	3.8	13.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	74	154	137	301	477		158	3124		220	3252	
V/C Ratio(X)	0.31	0.33	0.66	0.66	0.14		0.50	0.70		0.70	0.54	
Avail Cap(c_a), veh/h	198	412	368	356	897		305	3448		229	3290	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.2	31.3	32.3	33.1	27.6	0.0	33.8	13.6	0.0	33.2	11.2	0.0
Incr Delay (d2), s/veh	2.3	1.2	5.2	3.6	0.1	0.0	2.4	0.6	0.0	8.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.9	1.7	1.2	0.5	0.0	0.7	6.2	0.0	1.6	4.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.5	32.5	37.5	36.7	27.8	0.0	36.2	14.2	0.0	41.9	11.4	0.0
LnGrp LOS	D	C	D	D	C		D	B		D	B	
Approach Vol, veh/h		163			266	A		2270	A		1898	A
Approach Delay, s/veh		36.0			34.5			15.0			13.9	
Approach LOS		D			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.1	42.2	10.1	11.2	8.5	43.7	6.4	14.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.8	41.6	6.6	18.0	7.7	39.7	5.0	19.6
Max Q Clear Time (g_c+I1), s	5.8	22.1	5.6	6.3	3.9	15.7	2.6	3.3
Green Ext Time (p_c), s	0.0	15.6	0.1	0.5	0.1	14.7	0.0	0.2

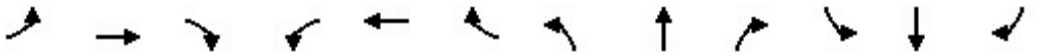
Intersection Summary	
HCM 6th Ctrl Delay	16.4
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.992			0.973			0.994			0.980	
Flt Protected	0.950	0.955			0.971		0.950			0.950		
Satd. Flow (prot)	1593	1588	0	0	1667	0	1676	4789	0	1676	4721	0
Flt Permitted	0.950	0.955					0.950			0.950		
Satd. Flow (perm)	1593	1588	0	0	1717	0	1676	4789	0	1676	4721	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		143			1			7			36	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



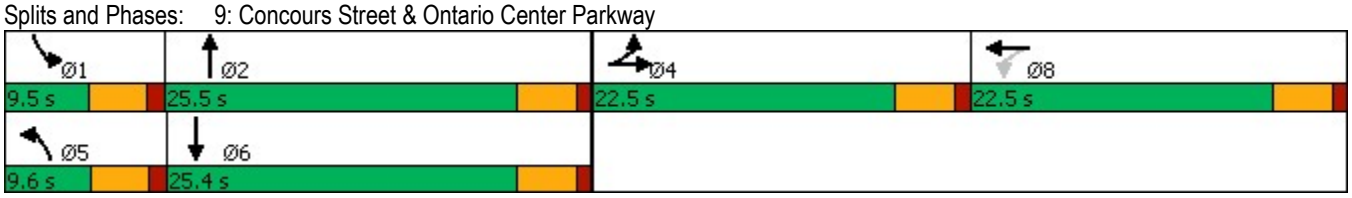
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	101	0	3	3	1	1	48	497	21	1	684	108
Future Volume (vph)	101	0	3	3	1	1	48	497	21	1	684	108
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	112	0	3	3	1	1	53	552	23	1	760	120
Shared Lane Traffic (%)	48%											
Lane Group Flow (vph)	58	57	0	0	5	0	53	575	0	1	880	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	101	0	3	1	48	497	1	684
Future Volume (vph)	101	0	3	1	48	497	1	684
Turn Type	Split	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	4	4		8	5	2	1	6
Permitted Phases			8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	9.6	25.5	9.5	25.4
Total Split (%)	28.1%	28.1%	28.1%	28.1%	12.0%	31.9%	11.9%	31.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	7.5	7.5		6.1	5.5	26.4	5.4	24.5
Actuated g/C Ratio	0.18	0.18		0.15	0.13	0.63	0.13	0.59
v/c Ratio	0.20	0.14		0.02	0.24	0.19	0.00	0.32
Control Delay	19.7	0.7		19.8	23.8	6.7	22.0	8.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	19.7	0.7		19.8	23.8	6.7	22.0	8.4
LOS	B	A		B	C	A	C	A
Approach Delay		10.3		19.8		8.2		8.5
Approach LOS		B		B		A		A

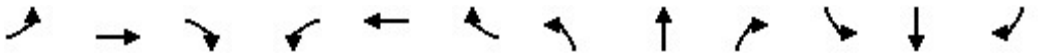
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 41.8	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.32	
Intersection Signal Delay: 8.5	Intersection LOS: A
Intersection Capacity Utilization 36.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	58	57	5	53	575	1	880
v/c Ratio	0.20	0.14	0.02	0.24	0.19	0.00	0.32
Control Delay	19.7	0.7	19.8	23.8	6.7	22.0	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.7	0.7	19.8	23.8	6.7	22.0	8.4
Queue Length 50th (ft)	10	0	1	9	16	0	26
Queue Length 95th (ft)	49	0	10	48	79	5	121
Internal Link Dist (ft)		319	68		111		176
Turn Bay Length (ft)	170			115		120	
Base Capacity (vph)	734	808	791	218	3052	214	2889
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.07	0.01	0.24	0.19	0.00	0.30

Intersection Summary



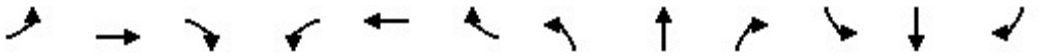
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	101	0	3	3	1	1	48	497	21	1	684	108
Future Volume (veh/h)	101	0	3	3	1	1	48	497	21	1	684	108
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	115	0	0	3	1	1	53	552	23	1	760	120
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	321	168	0	7	2	2	96	1885	78	5	1434	225
Arrive On Green	0.10	0.00	0.00	0.01	0.01	0.01	0.06	0.40	0.40	0.00	0.34	0.34
Sat Flow, veh/h	3375	1772	0	997	332	332	1688	4764	198	1688	4217	661
Grp Volume(v), veh/h	115	0	0	5	0	0	53	373	202	1	580	300
Grp Sat Flow(s),veh/h/ln	1688	1772	0	1662	0	0	1688	1612	1736	1688	1612	1653
Q Serve(g_s), s	1.1	0.0	0.0	0.1	0.0	0.0	1.1	2.8	2.9	0.0	5.2	5.3
Cycle Q Clear(g_c), s	1.1	0.0	0.0	0.1	0.0	0.0	1.1	2.8	2.9	0.0	5.2	5.3
Prop In Lane	1.00		0.00	0.60		0.20	1.00		0.11	1.00		0.40
Lane Grp Cap(c), veh/h	321	168	0	11	0	0	96	1276	687	5	1096	562
V/C Ratio(X)	0.36	0.00	0.00	0.44	0.00	0.00	0.55	0.29	0.29	0.21	0.53	0.53
Avail Cap(c_a), veh/h	1691	888	0	833	0	0	240	1885	1015	235	1876	962
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.2	0.0	0.0	17.8	0.0	0.0	16.5	7.4	7.4	17.9	9.5	9.6
Incr Delay (d2), s/veh	0.7	0.0	0.0	25.1	0.0	0.0	4.8	0.1	0.2	21.1	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.1	0.0	0.0	0.5	0.7	0.8	0.0	1.4	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.9	0.0	0.0	42.8	0.0	0.0	21.3	7.5	7.7	39.0	9.9	10.4
LnGrp LOS	B	A	A	D	A	A	C	A	A	D	A	B
Approach Vol, veh/h		115			5			628			881	
Approach Delay, s/veh		15.9			42.8			8.7			10.1	
Approach LOS		B			D			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.5	18.7		7.9	6.6	16.7		4.7				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	21.0		18.0	5.1	20.9		18.0				
Max Q Clear Time (g_c+I1), s	2.0	4.9		3.1	3.1	7.3		2.1				
Green Ext Time (p_c), s	0.0	3.3		0.3	0.0	4.9		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		10.1
HCM 6th LOS		B

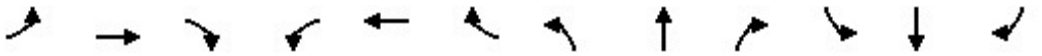
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			234			234			234			291
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



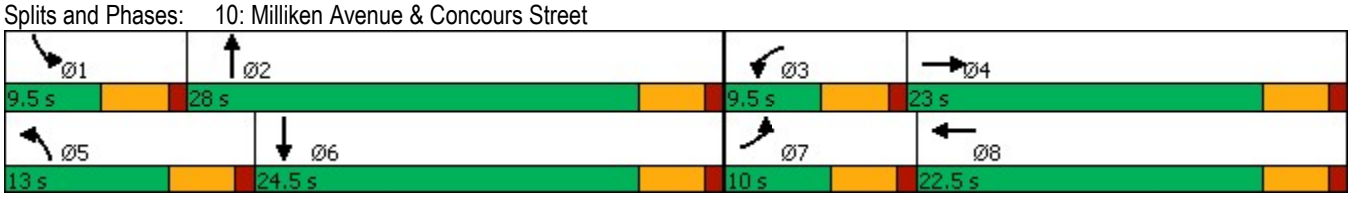
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	100	24	124	60	78	55	193	1024	67	103	1109	250
Future Volume (vph)	100	24	124	60	78	55	193	1024	67	103	1109	250
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	116	28	144	70	91	64	224	1191	78	120	1290	291
Shared Lane Traffic (%)												
Lane Group Flow (vph)	116	28	144	70	91	64	224	1191	78	120	1290	291

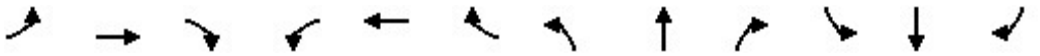
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	24	124	60	78	55	193	1024	67	103	1109	250
Future Volume (vph)	100	24	124	60	78	55	193	1024	67	103	1109	250
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	10.0	23.0		9.5	22.5		13.0	28.0		9.5	24.5	
Total Split (%)	14.3%	32.9%		13.6%	32.1%		18.6%	40.0%		13.6%	35.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	5.7	8.9	54.8	7.4	7.1	54.8	8.3	28.3	54.8	5.2	21.0	54.8
Actuated g/C Ratio	0.10	0.16	1.00	0.14	0.13	1.00	0.15	0.52	1.00	0.09	0.38	1.00
v/c Ratio	0.39	0.05	0.10	0.18	0.21	0.04	0.51	0.38	0.05	0.44	0.55	0.19
Control Delay	29.8	22.7	0.1	25.1	24.7	0.1	28.1	12.4	0.1	31.6	16.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	22.7	0.1	25.1	24.7	0.1	28.1	12.4	0.1	31.6	16.3	0.3
LOS	C	C	A	C	C	A	C	B	A	C	B	A
Approach Delay		14.3			17.8			14.1			14.6	
Approach LOS		B			B			B			B	

Intersection Summary			
Cycle Length: 70			
Actuated Cycle Length: 54.8			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 14.6		Intersection LOS: B	
Intersection Capacity Utilization 44.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 10: Milliken Avenue & Concours Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	116	28	144	70	91	64	224	1191	78	120	1290	291
v/c Ratio	0.39	0.05	0.10	0.18	0.21	0.04	0.51	0.38	0.05	0.44	0.55	0.19
Control Delay	29.8	22.7	0.1	25.1	24.7	0.1	28.1	12.4	0.1	31.6	16.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	22.7	0.1	25.1	24.7	0.1	28.1	12.4	0.1	31.6	16.3	0.3
Queue Length 50th (ft)	20	4	0	9	15	0	38	88	0	21	109	0
Queue Length 95th (ft)	41	14	0	28	32	0	67	114	0	42	139	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	301	1176	1500	391	1144	1500	466	3136	1500	274	2326	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.02	0.10	0.18	0.08	0.04	0.48	0.38	0.05	0.44	0.55	0.19

Intersection Summary

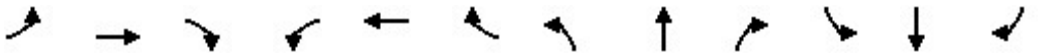
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	24	124	60	78	55	193	1024	67	103	1109	250
Future Volume (veh/h)	100	24	124	60	78	55	193	1024	67	103	1109	250
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	116	28	0	70	91	0	224	1191	0	120	1290	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	237	383		183	320		331	2250		241	2062	
Arrive On Green	0.08	0.11	0.00	0.06	0.10	0.00	0.11	0.37	0.00	0.08	0.34	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	116	28	0	70	91	0	224	1191	0	120	1290	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	1.8	0.4	0.0	1.1	1.2	0.0	3.6	7.4	0.0	1.9	8.6	0.0
Cycle Q Clear(g_c), s	1.8	0.4	0.0	1.1	1.2	0.0	3.6	7.4	0.0	1.9	8.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	237	383		183	320		331	2250		241	2062	
V/C Ratio(X)	0.49	0.07		0.38	0.28		0.68	0.53		0.50	0.63	
Avail Cap(c_a), veh/h	330	1286		300	1251		511	2957		300	2516	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.3	19.2	0.0	21.8	20.4	0.0	20.6	12.0	0.0	21.3	13.5	0.0
Incr Delay (d2), s/veh	1.6	0.1	0.0	1.3	0.5	0.0	2.4	0.2	0.0	1.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.1	0.0	0.4	0.5	0.0	1.2	2.1	0.0	0.6	2.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.8	19.3	0.0	23.1	20.9	0.0	23.1	12.2	0.0	22.9	13.8	0.0
LnGrp LOS	C	B		C	C		C	B		C	B	
Approach Vol, veh/h		144	A		161	A		1415	A		1410	A
Approach Delay, s/veh		22.1			21.8			13.9			14.6	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.5	22.4	7.6	10.0	10.0	20.9	8.5	9.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	23.5	5.0	18.5	8.5	20.0	5.5	18.0
Max Q Clear Time (g_c+I1), s	3.9	9.4	3.1	2.4	5.6	10.6	3.8	3.2
Green Ext Time (p_c), s	0.0	7.1	0.0	0.1	0.2	5.8	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	15.0
HCM 6th LOS	B

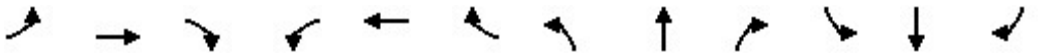
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			236			407			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



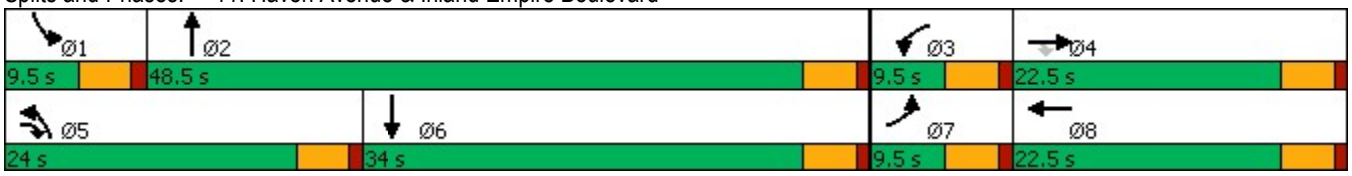
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	90	113	260	118	124	21	498	2233	647	52	1511	128
Future Volume (vph)	90	113	260	118	124	21	498	2233	647	52	1511	128
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	97	122	280	127	133	23	535	2401	696	56	1625	138
Shared Lane Traffic (%)												
Lane Group Flow (vph)	97	122	280	127	133	23	535	2401	696	56	1625	138

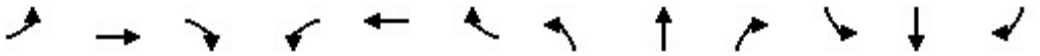
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	113	260	118	124	21	498	2233	647	52	1511	128
Future Volume (vph)	90	113	260	118	124	21	498	2233	647	52	1511	128
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	24.0	9.5	22.5		24.0	48.5		9.5	34.0	
Total Split (%)	10.6%	25.0%	26.7%	10.6%	25.0%		26.7%	53.9%		10.6%	37.8%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.2	8.6	28.3	5.2	8.6	74.0	18.3	48.6	74.0	5.2	29.3	74.0
Actuated g/C Ratio	0.07	0.12	0.38	0.07	0.12	1.00	0.25	0.66	1.00	0.07	0.40	1.00
v/c Ratio	0.47	0.31	0.45	0.46	0.34	0.02	0.75	0.60	0.46	0.27	0.68	0.09
Control Delay	45.5	35.4	15.0	42.7	35.7	0.0	35.4	12.0	1.0	40.3	22.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	35.4	15.0	42.7	35.7	0.0	35.4	12.0	1.0	40.3	22.1	0.1
LOS	D	D	B	D	D	A	D	B	A	D	C	A
Approach Delay		25.9			35.9			13.4			21.0	
Approach LOS		C			D			B			C	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 74		
Natural Cycle: 80		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.75		
Intersection Signal Delay: 17.6	Intersection LOS: B	
Intersection Capacity Utilization 63.3%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard

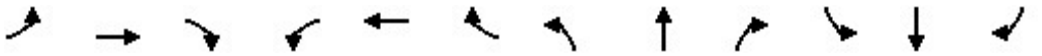




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	97	122	280	127	133	23	535	2401	696	56	1625	138
v/c Ratio	0.47	0.31	0.45	0.46	0.34	0.02	0.75	0.60	0.46	0.27	0.68	0.09
Control Delay	45.5	35.4	15.0	42.7	35.7	0.0	35.4	12.0	1.0	40.3	22.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	35.4	15.0	42.7	35.7	0.0	35.4	12.0	1.0	40.3	22.1	0.1
Queue Length 50th (ft)	25	30	71	22	33	0	129	244	0	14	201	0
Queue Length 95th (ft)	#54	56	134	42	60	0	#207	310	0	32	256	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	205	856	659	279	856	1500	799	3917	1500	205	2540	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.14	0.42	0.46	0.16	0.02	0.67	0.61	0.46	0.27	0.64	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	113	260	118	124	21	498	2233	647	52	1511	128
Future Volume (veh/h)	90	113	260	118	124	21	498	2233	647	52	1511	128
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	97	122	280	127	133	0	535	2401	0	56	1625	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	157	586	576	227	597		610	3095		127	2083	
Arrive On Green	0.05	0.17	0.17	0.06	0.18	0.00	0.21	0.51	0.00	0.04	0.34	0.00
Sat Flow, veh/h	2910	3367	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	97	122	280	127	133	0	535	2401	0	56	1625	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	2.7	2.6	11.7	2.6	2.8	0.0	14.7	26.5	0.0	1.6	19.8	0.0
Cycle Q Clear(g_c), s	2.7	2.6	11.7	2.6	2.8	0.0	14.7	26.5	0.0	1.6	19.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	157	586	576	227	597		610	3095		127	2083	
V/C Ratio(X)	0.62	0.21	0.49	0.56	0.22		0.88	0.78		0.44	0.78	
Avail Cap(c_a), veh/h	176	732	641	239	732		685	3239		176	2171	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.3	29.3	19.3	38.0	29.2	0.0	31.7	16.6	0.0	38.6	24.5	0.0
Incr Delay (d2), s/veh	5.4	0.2	0.6	2.6	0.2	0.0	11.4	1.2	0.0	2.4	1.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	1.0	4.0	0.9	1.1	0.0	6.0	8.6	0.0	0.6	7.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.7	29.5	20.0	40.7	29.4	0.0	43.1	17.7	0.0	41.0	26.3	0.0
LnGrp LOS	D	C	B	D	C		D	B		D	C	
Approach Vol, veh/h		499			260	A		2936	A		1681	A
Approach Delay, s/veh		26.9			34.9			22.4			26.8	
Approach LOS		C			C			C			C	

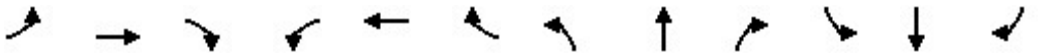
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	46.5	9.2	18.9	21.9	32.8	9.0	19.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	44.0	5.0	18.0	19.5	29.5	5.0	18.0
Max Q Clear Time (g_c+I1), s	3.6	28.5	4.6	13.7	16.7	21.8	4.7	4.8
Green Ext Time (p_c), s	0.0	13.6	0.0	0.7	0.6	5.8	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	24.8
HCM 6th LOS	C

Notes

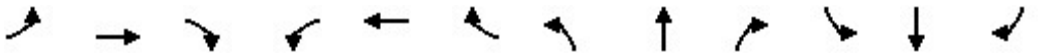
User approved changes to right turn type.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			236			236			236			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



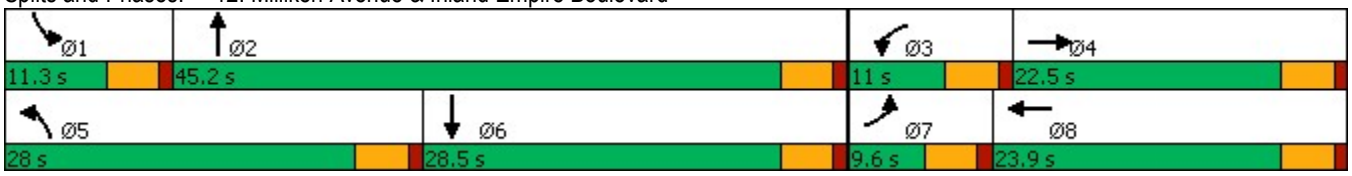
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	71	41	52	99	89	35	406	1156	110	82	1053	141
Future Volume (vph)	71	41	52	99	89	35	406	1156	110	82	1053	141
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	83	48	60	115	103	41	472	1344	128	95	1224	164
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	48	60	115	103	41	472	1344	128	95	1224	164

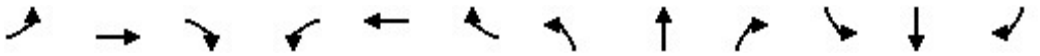
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	41	52	99	89	35	406	1156	110	82	1053	141
Future Volume (vph)	71	41	52	99	89	35	406	1156	110	82	1053	141
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.6	22.5		11.0	23.9		28.0	45.2		11.3	28.5	
Total Split (%)	10.7%	25.0%		12.2%	26.6%		31.1%	50.2%		12.6%	31.7%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	5.7	7.1	64.9	8.9	8.1	64.9	16.6	37.8	64.9	7.1	22.4	64.9
Actuated g/C Ratio	0.09	0.11	1.00	0.14	0.12	1.00	0.26	0.58	1.00	0.11	0.35	1.00
v/c Ratio	0.33	0.13	0.04	0.29	0.25	0.03	0.64	0.38	0.09	0.30	0.58	0.11
Control Delay	37.4	32.1	0.1	33.7	32.0	0.0	28.1	11.6	0.1	34.9	20.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.4	32.1	0.1	33.7	32.0	0.0	28.1	11.6	0.1	34.9	20.9	0.1
LOS	D	C	A	C	C	A	C	B	A	C	C	A
Approach Delay		24.4			27.7			14.8			19.5	
Approach LOS		C			C			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 64.9	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 17.9	Intersection LOS: B
Intersection Capacity Utilization 51.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	83	48	60	115	103	41	472	1344	128	95	1224	164
v/c Ratio	0.33	0.13	0.04	0.29	0.25	0.03	0.64	0.38	0.09	0.30	0.58	0.11
Control Delay	37.4	32.1	0.1	33.7	32.0	0.0	28.1	11.6	0.1	34.9	20.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.4	32.1	0.1	33.7	32.0	0.0	28.1	11.6	0.1	34.9	20.9	0.1
Queue Length 50th (ft)	18	10	0	25	22	0	98	110	0	20	129	0
Queue Length 95th (ft)	40	26	0	51	45	0	141	136	0	44	179	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	253	1036	1500	408	1117	1500	1167	3928	1500	337	2503	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.05	0.04	0.28	0.09	0.03	0.40	0.34	0.09	0.28	0.49	0.11

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	41	52	99	89	35	406	1156	110	82	1053	141
Future Volume (veh/h)	71	41	52	99	89	35	406	1156	110	82	1053	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	83	48	0	115	103	0	472	1344	0	95	1224	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	185	284		212	315		617	2830		197	1951	
Arrive On Green	0.06	0.08	0.00	0.07	0.09	0.00	0.21	0.46	0.00	0.07	0.32	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	83	48	0	115	103	0	472	1344	0	95	1224	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	1.6	0.8	0.0	2.2	1.7	0.0	8.8	8.8	0.0	1.8	9.9	0.0
Cycle Q Clear(g_c), s	1.6	0.8	0.0	2.2	1.7	0.0	8.8	8.8	0.0	1.8	9.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	185	284		212	315		617	2830		197	1951	
V/C Ratio(X)	0.45	0.17		0.54	0.33		0.77	0.47		0.48	0.63	
Avail Cap(c_a), veh/h	256	1047		327	1128		1181	4285		342	2527	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.1	24.6	0.0	25.9	24.5	0.0	21.5	10.7	0.0	26.0	16.7	0.0
Incr Delay (d2), s/veh	1.7	0.3	0.0	2.2	0.6	0.0	2.0	0.1	0.0	1.8	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.3	0.0	0.8	0.6	0.0	2.9	2.5	0.0	0.6	3.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.8	24.9	0.0	28.1	25.1	0.0	23.5	10.8	0.0	27.8	17.1	0.0
LnGrp LOS	C	C		C	C		C	B		C	B	
Approach Vol, veh/h		131	A		218	A		1816	A		1319	A
Approach Delay, s/veh		26.8			26.7			14.1			17.9	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	31.4	8.7	9.4	16.8	23.0	8.2	9.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.8	40.7	6.5	18.0	23.5	24.0	5.1	19.4
Max Q Clear Time (g_c+I1), s	3.8	10.8	4.2	2.8	10.8	11.9	3.6	3.7
Green Ext Time (p_c), s	0.1	12.1	0.1	0.1	1.4	6.6	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	16.8
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.940	0.850				
Flt Protected	0.971					
Satd. Flow (prot)	2951	1365	6071	0	0	6071
Flt Permitted	0.971					
Satd. Flow (perm)	2951	1365	6071	0	0	6071
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	1	1				
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

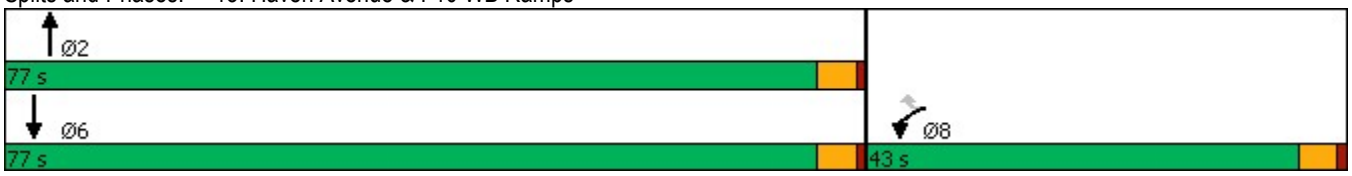
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	505	726	2745	0	0	1589
Future Volume (vph)	505	726	2745	0	0	1589
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	555	798	3016	0	0	1746
Shared Lane Traffic (%)		46%				
Lane Group Flow (vph)	922	431	3016	0	0	1746

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	505	726	2745	1589
Future Volume (vph)	505	726	2745	1589
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	43.0	43.0	77.0	77.0
Total Split (%)	35.8%	35.8%	64.2%	64.2%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	38.5	38.5	72.5	72.5
Actuated g/C Ratio	0.32	0.32	0.60	0.60
v/c Ratio	0.97	0.98	0.82	0.48
Control Delay	64.1	80.3	21.2	13.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	64.1	80.3	21.2	13.7
LOS	E	F	C	B
Approach Delay	69.2		21.2	13.7
Approach LOS	E		C	B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 29.7	Intersection LOS: C
Intersection Capacity Utilization 83.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps



Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	922	431	3016	1746
v/c Ratio	0.97	0.98	0.82	0.48
Control Delay	64.1	80.3	21.2	13.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	64.1	80.3	21.2	13.7
Queue Length 50th (ft)	361	362	502	205
Queue Length 95th (ft)	#502	#598	552	233
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	947	438	3667	3667
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.97	0.98	0.82	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

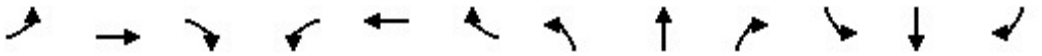
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	505	726	2745	0	0	1589
Future Volume (veh/h)	505	726	2745	0	0	1589
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1673	1772	1772	0	0	1772
Adj Flow Rate, veh/h	451	909	3016	0	0	1746
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	512	964	3673	0	0	3673
Arrive On Green	0.32	0.32	0.60	0.00	0.00	0.60
Sat Flow, veh/h	1594	3003	6592	0	0	6592
Grp Volume(v), veh/h	451	909	3016	0	0	1746
Grp Sat Flow(s),veh/h/ln	1594	1502	1524	0	0	1524
Q Serve(g_s), s	31.6	34.7	45.9	0.0	0.0	18.8
Cycle Q Clear(g_c), s	31.6	34.7	45.9	0.0	0.0	18.8
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	512	964	3673	0	0	3673
V/C Ratio(X)	0.88	0.94	0.82	0.00	0.00	0.48
Avail Cap(c_a), veh/h	521	982	3751	0	0	3751
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	37.9	38.9	18.4	0.0	0.0	13.0
Incr Delay (d2), s/veh	15.9	16.6	1.5	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.4	14.8	15.5	0.0	0.0	6.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	53.8	55.5	19.9	0.0	0.0	13.1
LnGrp LOS	D	E	B	A	A	B
Approach Vol, veh/h	1360		3016			1746
Approach Delay, s/veh	54.9		19.9			13.1
Approach LOS	D		B			B

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		75.5			75.5	42.3
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		72.5			72.5	38.5
Max Q Clear Time (g_c+I1), s		47.9			20.8	36.7
Green Ext Time (p_c), s		23.1			21.9	1.1

Intersection Summary	
HCM 6th Ctrl Delay	25.8
HCM 6th LOS	C

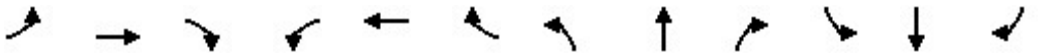
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			266			182			338			235
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



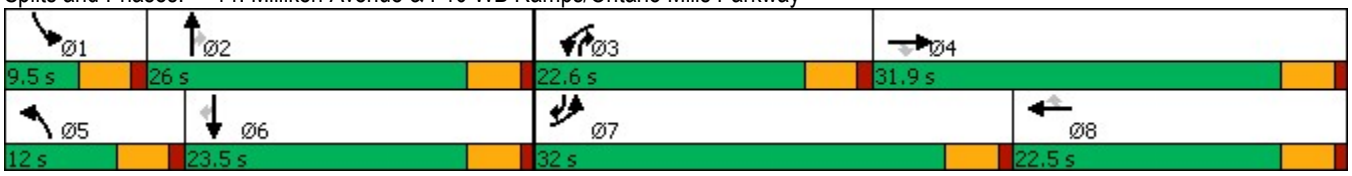
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	683	89	237	162	185	34	154	904	301	83	775	253
Future Volume (vph)	683	89	237	162	185	34	154	904	301	83	775	253
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	767	100	266	182	208	38	173	1016	338	93	871	284
Shared Lane Traffic (%)												
Lane Group Flow (vph)	767	100	266	182	208	38	173	1016	338	93	871	284

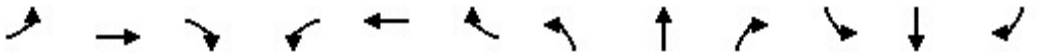
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	683	89	237	162	185	34	154	904	301	83	775	253
Future Volume (vph)	683	89	237	162	185	34	154	904	301	83	775	253
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	32.0	31.9	31.9	22.6	22.5	22.5	12.0	26.0	22.6	9.5	23.5	32.0
Total Split (%)	35.6%	35.4%	35.4%	25.1%	25.0%	25.0%	13.3%	28.9%	25.1%	10.6%	26.1%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	25.0	24.7	24.7	10.5	10.3	10.3	7.5	22.4	37.4	5.1	17.5	47.0
Actuated g/C Ratio	0.32	0.31	0.31	0.13	0.13	0.13	0.10	0.29	0.48	0.06	0.22	0.60
v/c Ratio	0.84	0.18	0.41	0.47	0.47	0.11	0.62	0.59	0.38	0.50	0.64	0.29
Control Delay	34.9	21.6	5.1	36.5	36.4	0.6	47.3	27.3	3.0	48.0	30.6	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	21.6	5.1	36.5	36.4	0.6	47.3	27.3	3.0	48.0	30.6	2.6
LOS	C	C	A	D	D	A	D	C	A	D	C	A
Approach Delay		26.7			33.2			24.1			25.6	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 78.5	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 26.1	Intersection LOS: C
Intersection Capacity Utilization 61.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway

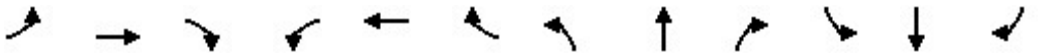




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	767	100	266	182	208	38	173	1016	338	93	871	284
v/c Ratio	0.84	0.18	0.41	0.47	0.47	0.11	0.62	0.59	0.38	0.50	0.64	0.29
Control Delay	34.9	21.6	5.1	36.5	36.4	0.6	47.3	27.3	3.0	48.0	30.6	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	21.6	5.1	36.5	36.4	0.6	47.3	27.3	3.0	48.0	30.6	2.6
Queue Length 50th (ft)	182	36	0	45	53	0	45	135	0	24	118	9
Queue Length 95th (ft)	#268	76	51	74	85	0	#88	176	41	#52	155	40
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	1024	623	701	674	777	487	279	1746	1007	186	1485	1039
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.16	0.38	0.27	0.27	0.08	0.62	0.58	0.34	0.50	0.59	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	683	89	237	162	185	34	154	904	301	83	775	253
Future Volume (veh/h)	683	89	237	162	185	34	154	904	301	83	775	253
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	767	100	266	182	208	38	173	1016	338	93	871	284
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	892	561	475	270	345	154	246	1663	549	174	1513	833
Arrive On Green	0.31	0.32	0.32	0.09	0.10	0.10	0.08	0.27	0.27	0.06	0.25	0.25
Sat Flow, veh/h	2910	1772	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	767	100	266	182	208	38	173	1016	338	93	871	284
Grp Sat Flow(s),veh/h/ln	1455	1772	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	17.3	2.9	10.3	4.2	4.1	1.6	4.0	10.1	12.8	2.2	8.7	7.2
Cycle Q Clear(g_c), s	17.3	2.9	10.3	4.2	4.1	1.6	4.0	10.1	12.8	2.2	8.7	7.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	892	561	475	270	345	154	246	1663	549	174	1513	833
V/C Ratio(X)	0.86	0.18	0.56	0.68	0.60	0.25	0.70	0.61	0.62	0.53	0.58	0.34
Avail Cap(c_a), veh/h	1148	696	590	756	869	388	313	1880	602	209	1661	869
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.8	17.3	19.8	30.6	29.9	28.8	31.1	22.1	18.1	31.8	23.0	8.5
Incr Delay (d2), s/veh	5.5	0.2	1.0	2.9	1.7	0.8	5.0	0.5	1.6	2.5	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	1.1	3.5	1.5	1.7	0.6	1.5	3.5	4.3	0.8	3.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.2	17.4	20.8	33.5	31.6	29.6	36.0	22.6	19.7	34.3	23.4	8.8
LnGrp LOS	C	B	C	C	C	C	D	C	B	C	C	A
Approach Vol, veh/h		1133			428			1527			1248	
Approach Delay, s/veh		25.5			32.3			23.5			20.9	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.7	23.5	11.0	26.6	10.4	21.8	25.9	11.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	21.5	18.1	27.4	7.5	19.0	27.5	18.0
Max Q Clear Time (g_c+I1), s	4.2	14.8	6.2	12.3	6.0	10.7	19.3	6.1
Green Ext Time (p_c), s	0.0	4.2	0.4	1.3	0.1	4.3	2.1	1.0

Intersection Summary	
HCM 6th Ctrl Delay	24.1
HCM 6th LOS	C

Notes

User approved changes to right turn type.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.993	0.850				
Flt Protected	0.954					
Satd. Flow (prot)	3063	1365	0	6071	6071	0
Flt Permitted	0.954					
Satd. Flow (perm)	3063	1365	0	6071	6071	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	3	3				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

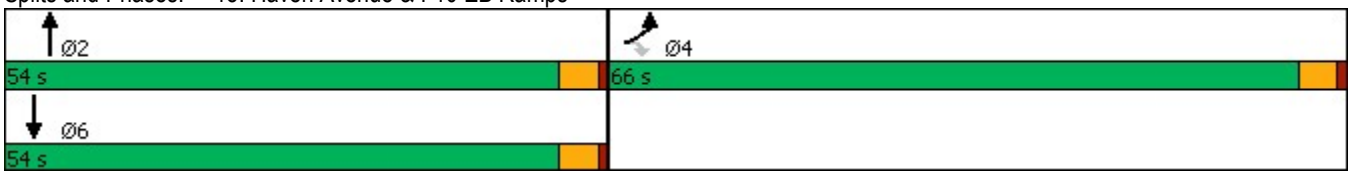
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	1313	592	0	1764	1575	0
Future Volume (vph)	1313	592	0	1764	1575	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1475	665	0	1982	1770	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	1542	598	0	1982	1770	0

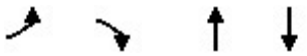
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1313	592	1764	1575
Future Volume (vph)	1313	592	1764	1575
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	66.0	66.0	54.0	54.0
Total Split (%)	55.0%	55.0%	45.0%	45.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	61.5	61.5	49.4	49.4
Actuated g/C Ratio	0.51	0.51	0.41	0.41
v/c Ratio	0.98	0.85	0.79	0.71
Control Delay	47.7	38.9	33.7	31.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	47.7	38.9	33.7	31.2
LOS	D	D	C	C
Approach Delay	45.2		33.7	31.2
Approach LOS	D		C	C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.9	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 37.1	Intersection LOS: D
Intersection Capacity Utilization 83.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1542	598	1982	1770
v/c Ratio	0.98	0.85	0.79	0.71
Control Delay	47.7	38.9	33.7	31.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	47.7	38.9	33.7	31.2
Queue Length 50th (ft)	582	424	383	325
Queue Length 95th (ft)	#750	#668	424	363
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	1572	701	2506	2506
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.98	0.85	0.79	0.71

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1313	592	0	1764	1575	0
Future Volume (veh/h)	1313	592	0	1764	1575	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1772	0	1772	1772	0
Adj Flow Rate, veh/h	1475	665	0	1982	1770	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	1621	764	0	2504	2504	0
Arrive On Green	0.51	0.51	0.00	0.41	0.41	0.00
Sat Flow, veh/h	3188	1502	0	6592	6592	0
Grp Volume(v), veh/h	1475	665	0	1982	1770	0
Grp Sat Flow(s),veh/h/ln	1594	1502	0	1524	1524	0
Q Serve(g_s), s	47.3	43.6	0.0	31.7	26.9	0.0
Cycle Q Clear(g_c), s	47.3	43.6	0.0	31.7	26.9	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	1621	764	0	2504	2504	0
V/C Ratio(X)	0.91	0.87	0.00	0.79	0.71	0.00
Avail Cap(c_a), veh/h	1755	827	0	2702	2702	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.1	24.2	0.0	28.7	27.3	0.0
Incr Delay (d2), s/veh	7.1	9.5	0.0	1.6	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.6	16.7	0.0	11.6	9.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	32.2	33.7	0.0	30.3	28.1	0.0
LnGrp LOS	C	C	A	C	C	A
Approach Vol, veh/h	2140			1982	1770	
Approach Delay, s/veh	32.7			30.3	28.1	
Approach LOS	C			C	C	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		50.4		61.3		50.4
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		49.5		61.5		49.5
Max Q Clear Time (g_c+I1), s		33.7		49.3		28.9
Green Ext Time (p_c), s		12.2		7.5		13.5

Intersection Summary		
HCM 6th Ctrl Delay		30.5
HCM 6th LOS		C

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1600	1800	1600	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2891	1500	2891	6071	6071	1500
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2891	1500	2891	6071	6071	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		6				424
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	654	587	159	708	743	443
Future Volume (vph)	654	587	159	708	743	443
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	752	675	183	814	854	509
Shared Lane Traffic (%)						
Lane Group Flow (vph)	752	675	183	814	854	509

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	654	587	159	708	743	443
Future Volume (vph)	654	587	159	708	743	443
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	38.0	27.0	27.0	52.0	25.0	38.0
Total Split (%)	42.2%	30.0%	30.0%	57.8%	27.8%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	24.5	41.5	12.3	34.0	17.0	46.2
Actuated g/C Ratio	0.36	0.61	0.18	0.50	0.25	0.68
v/c Ratio	0.72	0.74	0.35	0.27	0.56	0.44
Control Delay	24.2	15.0	28.1	10.4	25.3	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.2	15.0	28.1	10.4	25.3	2.4
LOS	C	B	C	B	C	A
Approach Delay	19.8			13.7	16.7	
Approach LOS	B			B	B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 68	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 17.1	Intersection LOS: B
Intersection Capacity Utilization 57.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

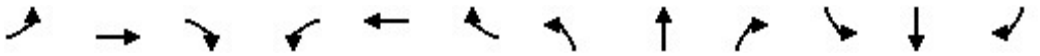
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	752	675	183	814	854	509
v/c Ratio	0.72	0.74	0.35	0.27	0.56	0.44
Control Delay	24.2	15.0	28.1	10.4	25.3	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.2	15.0	28.1	10.4	25.3	2.4
Queue Length 50th (ft)	131	174	35	53	87	9
Queue Length 95th (ft)	237	295	69	84	154	46
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	1498	1168	1006	4452	1924	1315
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.58	0.18	0.18	0.44	0.39

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	654	587	159	708	743	443
Future Volume (veh/h)	654	587	159	708	743	443
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1772	1575	1772	1772	1772
Adj Flow Rate, veh/h	752	675	183	814	854	509
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1312	819	276	2530	1543	1057
Arrive On Green	0.45	0.45	0.09	0.42	0.25	0.25
Sat Flow, veh/h	2910	1502	2910	6343	6343	1502
Grp Volume(v), veh/h	752	675	183	814	854	509
Grp Sat Flow(s),veh/h/ln	1455	1502	1455	1524	1524	1502
Q Serve(g_s), s	12.8	24.9	4.1	6.0	8.2	10.2
Cycle Q Clear(g_c), s	12.8	24.9	4.1	6.0	8.2	10.2
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1312	819	276	2530	1543	1057
V/C Ratio(X)	0.57	0.82	0.66	0.32	0.55	0.48
Avail Cap(c_a), veh/h	1453	892	976	4314	1862	1136
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.6	12.6	29.3	13.2	21.8	4.5
Incr Delay (d2), s/veh	0.4	5.9	2.7	0.1	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	1.3	1.5	1.9	2.8	8.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.1	18.5	32.0	13.3	22.1	4.8
LnGrp LOS	B	B	C	B	C	A
Approach Vol, veh/h	1427			997	1363	
Approach Delay, s/veh	16.2			16.8	15.6	
Approach LOS	B			B	B	

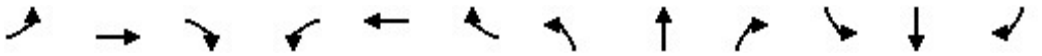
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		32.4		34.8	10.9	21.5
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		47.5		33.5	22.5	20.5
Max Q Clear Time (g_c+I1), s		8.0		26.9	6.1	12.2
Green Ext Time (p_c), s		6.8		3.4	0.5	4.8

Intersection Summary	
HCM 6th Ctrl Delay	16.1
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.956				0.850			0.850		0.973	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4606	0	2891	3353	1500	2891	4818	1500	2891	5907	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4606	0	2891	3353	1500	2891	4818	1500	2891	5907	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		85				136			177		57	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	364	725	300	237	609	150	334	1733	278	228	1696	370
Future Volume (vph)	364	725	300	237	609	150	334	1733	278	228	1696	370
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	396	788	326	258	662	163	363	1884	302	248	1843	402
Shared Lane Traffic (%)												
Lane Group Flow (vph)	396	1114	0	258	662	163	363	1884	302	248	2245	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	364	725	237	609	150	334	1733	278	228	1696
Future Volume (vph)	364	725	237	609	150	334	1733	278	228	1696
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	22.0	37.0	14.0	29.0	29.0	14.0	57.0		12.0	55.0
Total Split (%)	18.3%	30.8%	11.7%	24.2%	24.2%	11.7%	47.5%		10.0%	45.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	17.5	32.5	9.5	24.5	24.5	9.5	52.5	120.0	7.5	50.5
Actuated g/C Ratio	0.15	0.27	0.08	0.20	0.20	0.08	0.44	1.00	0.06	0.42
v/c Ratio	0.94	0.85	1.13	0.97	0.39	1.59	0.89	0.20	1.38	0.89
Control Delay	82.3	45.6	149.0	75.0	13.2	322.0	37.9	0.3	242.4	36.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.3	45.6	149.0	75.0	13.2	322.0	37.9	0.3	242.4	36.9
LOS	F	D	F	E	B	F	D	A	F	D
Approach Delay		55.2		83.3			73.9			57.4
Approach LOS		E		F			E			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.59	
Intersection Signal Delay: 66.2	Intersection LOS: E
Intersection Capacity Utilization 88.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Haven Avenue & 4th Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	396	1114	258	662	163	363	1884	302	248	2245
v/c Ratio	0.94	0.85	1.13	0.97	0.39	1.59	0.89	0.20	1.38	0.89
Control Delay	82.3	45.6	149.0	75.0	13.2	322.0	37.9	0.3	242.4	36.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.3	45.6	149.0	75.0	13.2	322.0	37.9	0.3	242.4	36.9
Queue Length 50th (ft)	158	279	~119	269	17	~206	484	0	~130	451
Queue Length 95th (ft)	#255	339	#206	#392	78	#305	557	0	#216	506
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	421	1309	228	684	414	228	2107	1500	180	2518
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.85	1.13	0.97	0.39	1.59	0.89	0.20	1.38	0.89

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

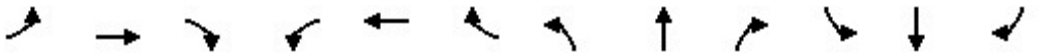
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	364	725	300	237	609	150	334	1733	278	228	1696	370
Future Volume (veh/h)	364	725	300	237	609	150	334	1733	278	228	1696	370
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	396	788	326	258	662	163	363	1884	0	248	1843	402
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	424	912	374	230	687	307	230	2116		182	2124	462
Arrive On Green	0.15	0.27	0.27	0.08	0.20	0.20	0.08	0.44	0.00	0.06	0.42	0.42
Sat Flow, veh/h	2910	3366	1382	2910	3367	1502	2910	4837	1502	2910	5047	1098
Grp Volume(v), veh/h	396	755	359	258	662	163	363	1884	0	248	1669	576
Grp Sat Flow(s),veh/h/ln	1455	1612	1523	1455	1683	1502	1455	1612	1502	1455	1524	1574
Q Serve(g_s), s	16.1	26.7	27.0	9.5	23.4	11.6	9.5	43.1	0.0	7.5	40.0	40.1
Cycle Q Clear(g_c), s	16.1	26.7	27.0	9.5	23.4	11.6	9.5	43.1	0.0	7.5	40.0	40.1
Prop In Lane	1.00		0.91	1.00		1.00	1.00		1.00	1.00		0.70
Lane Grp Cap(c), veh/h	424	873	413	230	687	307	230	2116		182	1924	662
V/C Ratio(X)	0.93	0.86	0.87	1.12	0.96	0.53	1.58	0.89		1.36	0.87	0.87
Avail Cap(c_a), veh/h	424	873	413	230	687	307	230	2116		182	1924	662
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.7	41.6	41.7	55.3	47.3	42.6	55.3	31.1	0.0	56.3	31.7	31.7
Incr Delay (d2), s/veh	27.6	9.0	17.9	95.3	25.4	1.8	278.9	6.1	0.0	194.8	5.6	14.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	11.6	12.1	6.5	12.2	4.5	12.4	17.5	0.0	7.7	15.4	17.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.3	50.6	59.7	150.5	72.7	44.4	334.2	37.2	0.0	251.0	37.3	46.3
LnGrp LOS	E	D	E	F	E	D	F	D		F	D	D
Approach Vol, veh/h		1510			1083			2247	A		2493	
Approach Delay, s/veh		60.0			87.0			85.2			60.6	
Approach LOS		E			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	57.0	14.0	37.0	14.0	55.0	22.0	29.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	52.5	9.5	32.5	9.5	50.5	17.5	24.5
Max Q Clear Time (g_c+I1), s	9.5	45.1	11.5	29.0	11.5	42.1	18.1	25.4
Green Ext Time (p_c), s	0.0	6.2	0.0	2.2	0.0	7.3	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	71.9
HCM 6th LOS	E

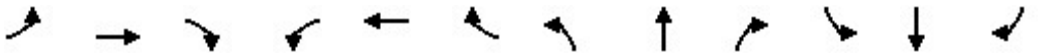
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.995				0.850			0.850		0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	6040	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	6040	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9				203			133		176	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	4	1961	65	1	1220	193	64	0	9	151	0	12
Future Volume (vph)	4	1961	65	1	1220	193	64	0	9	151	0	12
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	4	2064	68	1	1284	203	67	0	9	159	0	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	2132	0	1	1284	203	67	0	9	159	13	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	4	1961	1	1220	193	64	9	151	0
Future Volume (vph)	4	1961	1	1220	193	64	9	151	0
Turn Type	Prot	NA	Prot	NA	Perm	Prot	Perm	Prot	NA
Protected Phases	7	4	3	8		5		1	6
Permitted Phases					8		2		
Detector Phase	7	4	3	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.5	42.4	9.5	42.4	42.4	11.8	23.7	14.4	26.3
Total Split (%)	10.6%	47.1%	10.6%	47.1%	47.1%	13.1%	26.3%	16.0%	29.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.0	37.9	5.0	37.9	37.9	6.9	5.5	9.9	10.6
Actuated g/C Ratio	0.07	0.55	0.07	0.55	0.55	0.10	0.08	0.14	0.15
v/c Ratio	0.03	0.64	0.01	0.48	0.22	0.42	0.04	0.69	0.02
Control Delay	32.2	12.1	32.0	10.6	2.2	38.4	0.3	47.4	0.1
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	12.1	32.0	10.6	2.2	38.4	0.3	47.4	0.1
LOS	C	B	C	B	A	D	A	D	A
Approach Delay		12.1		9.5					43.8
Approach LOS		B		A					D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 68.6	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 13.0	Intersection LOS: B
Intersection Capacity Utilization 55.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	4	2132	1	1284	203	67	9	159	13
v/c Ratio	0.03	0.64	0.01	0.48	0.22	0.42	0.04	0.69	0.02
Control Delay	32.2	12.1	32.0	10.6	2.2	38.4	0.3	47.4	0.1
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	12.1	32.0	10.6	2.2	38.4	0.3	47.4	0.1
Queue Length 50th (ft)	2	151	0	102	0	26	0	62	0
Queue Length 95th (ft)	11	257	5	183	31	69	0	#169	0
Internal Link Dist (ft)		2546		362					358
Turn Bay Length (ft)	130		130		145	165	165	50	
Base Capacity (vph)	115	3351	115	2670	921	168	516	229	1028
Starvation Cap Reductn	0	0	0	320	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.64	0.01	0.55	0.22	0.40	0.02	0.69	0.01

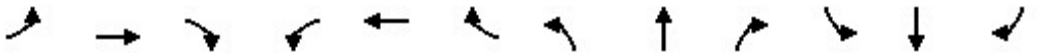
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1961	65	1	1220	193	64	0	9	151	0	12
Future Volume (veh/h)	4	1961	65	1	1220	193	64	0	9	151	0	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	4	2064	68	1	1284	203	67	0	9	159	0	13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	9	3142	104	3	2470	767	87	139	118	194	246	219
Arrive On Green	0.01	0.51	0.51	0.00	0.51	0.51	0.05	0.00	0.08	0.12	0.00	0.15
Sat Flow, veh/h	1594	6106	201	1594	4837	1502	1594	1772	1502	1594	1683	1502
Grp Volume(v), veh/h	4	1545	587	1	1284	203	67	0	9	159	0	13
Grp Sat Flow(s),veh/h/ln	1594	1524	1736	1594	1612	1502	1594	1772	1502	1594	1683	1502
Q Serve(g_s), s	0.2	15.7	15.7	0.0	11.2	4.9	2.6	0.0	0.4	6.2	0.0	0.5
Cycle Q Clear(g_c), s	0.2	15.7	15.7	0.0	11.2	4.9	2.6	0.0	0.4	6.2	0.0	0.5
Prop In Lane	1.00		0.12	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	9	2352	893	3	2470	767	87	139	118	194	246	219
V/C Ratio(X)	0.47	0.66	0.66	0.40	0.52	0.26	0.77	0.00	0.08	0.82	0.00	0.06
Avail Cap(c_a), veh/h	125	2727	1036	125	2886	896	183	536	454	248	578	515
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.5	11.3	11.3	31.7	10.4	8.8	29.6	0.0	27.1	27.2	0.0	23.4
Incr Delay (d2), s/veh	34.9	0.5	1.2	79.4	0.2	0.2	13.3	0.0	0.3	15.3	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	4.5	5.3	0.1	3.4	1.4	1.3	0.0	0.1	3.1	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.4	11.8	12.5	111.1	10.5	9.0	42.9	0.0	27.4	42.5	0.0	23.5
LnGrp LOS	E	B	B	F	B	A	D	A	C	D	A	C
Approach Vol, veh/h		2136			1488			76			172	
Approach Delay, s/veh		12.1			10.4			41.1			41.0	
Approach LOS		B			B			D			D	

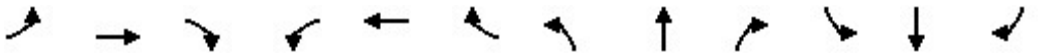
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.2	9.5	4.6	37.2	8.0	13.8	4.8	36.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.9	19.2	5.0	37.9	7.3	21.8	5.0	37.9
Max Q Clear Time (g_c+I1), s	8.2	2.4	2.0	17.7	4.6	2.5	2.2	13.2
Green Ext Time (p_c), s	0.1	0.0	0.0	14.9	0.0	0.0	0.0	11.4

Intersection Summary	
HCM 6th Ctrl Delay	13.3
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.996				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.953	
Satd. Flow (prot)	2891	6065	0	1583	4798	0	1583	1765	1500	0	1682	1500
Flt Permitted	0.950			0.950			0.727				0.731	
Satd. Flow (perm)	2891	6065	0	1583	4798	0	1212	1765	1500	0	1290	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			7				153			94
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



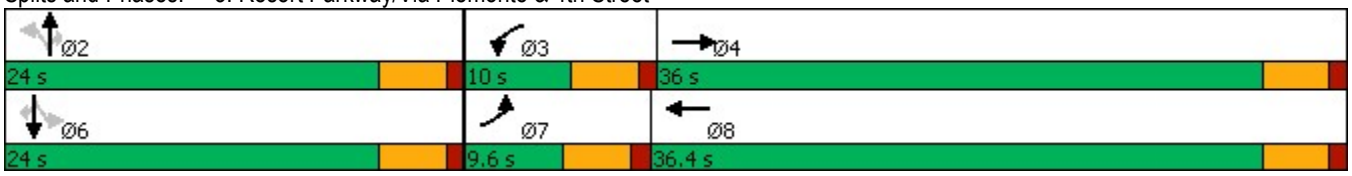
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	29	2082	8	65	1373	38	36	0	45	43	1	20
Future Volume (vph)	29	2082	8	65	1373	38	36	0	45	43	1	20
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	31	2192	8	68	1445	40	38	0	47	45	1	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	2200	0	68	1485	0	38	0	47	0	46	21

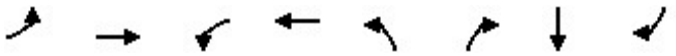
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	29	2082	65	1373	36	45	43	1	20
Future Volume (vph)	29	2082	65	1373	36	45	43	1	20
Turn Type	Prot	NA	Prot	NA	Perm	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8				6	
Permitted Phases					2	2	6		6
Detector Phase	7	4	3	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.6	36.0	10.0	36.4	24.0	24.0	24.0	24.0	24.0
Total Split (%)	13.7%	51.4%	14.3%	52.0%	34.3%	34.3%	34.3%	34.3%	34.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min
Act Effct Green (s)	5.2	31.9	5.6	33.9	7.4	7.4		7.4	7.4
Actuated g/C Ratio	0.10	0.59	0.10	0.63	0.14	0.14		0.14	0.14
v/c Ratio	0.11	0.61	0.42	0.49	0.23	0.14		0.26	0.07
Control Delay	26.0	9.1	34.0	7.1	25.8	0.9		26.2	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	26.0	9.1	34.0	7.1	25.8	0.9		26.2	0.5
LOS	C	A	C	A	C	A		C	A
Approach Delay		9.4		8.3				18.2	
Approach LOS		A		A				B	

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 53.9	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 9.2	Intersection LOS: A
Intersection Capacity Utilization 56.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street

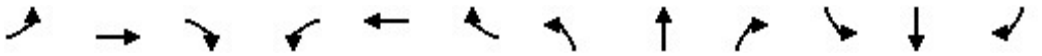




Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBT	SBR
Lane Group Flow (vph)	31	2200	68	1485	38	47	46	21
v/c Ratio	0.11	0.61	0.42	0.49	0.23	0.14	0.26	0.07
Control Delay	26.0	9.1	34.0	7.1	25.8	0.9	26.2	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	9.1	34.0	7.1	25.8	0.9	26.2	0.5
Queue Length 50th (ft)	5	141	23	56	12	0	15	0
Queue Length 95th (ft)	17	199	#66	161	35	0	41	0
Internal Link Dist (ft)		362		428			378	
Turn Bay Length (ft)	220		125		115	115		110
Base Capacity (vph)	277	3593	163	3040	444	647	473	609
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.61	0.42	0.49	0.09	0.07	0.10	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	2082	8	65	1373	38	36	0	45	43	1	20
Future Volume (veh/h)	29	2082	8	65	1373	38	36	0	45	43	1	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	31	2192	8	68	1445	40	38	0	47	45	1	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	102	3538	13	98	2839	79	241	182	154	281	5	154
Arrive On Green	0.04	0.56	0.56	0.06	0.59	0.59	0.10	0.00	0.10	0.10	0.10	0.10
Sat Flow, veh/h	2910	6316	23	1594	4839	134	1312	1772	1502	1324	45	1502
Grp Volume(v), veh/h	31	1586	614	68	963	522	38	0	47	46	0	21
Grp Sat Flow(s),veh/h/ln	1455	1524	1768	1594	1612	1748	1312	1772	1502	1369	0	1502
Q Serve(g_s), s	0.5	11.5	11.5	2.1	8.6	8.6	1.4	0.0	1.4	1.5	0.0	0.6
Cycle Q Clear(g_c), s	0.5	11.5	11.5	2.1	8.6	8.6	2.9	0.0	1.4	1.5	0.0	0.6
Prop In Lane	1.00		0.01	1.00		0.08	1.00		1.00	0.98		1.00
Lane Grp Cap(c), veh/h	102	2561	990	98	1892	1025	241	182	154	286	0	154
V/C Ratio(X)	0.30	0.62	0.62	0.69	0.51	0.51	0.16	0.00	0.30	0.16	0.00	0.14
Avail Cap(c_a), veh/h	303	2938	1136	179	2099	1137	628	705	597	689	0	597
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.1	7.3	7.3	22.5	6.0	6.0	21.7	0.0	20.4	20.4	0.0	20.0
Incr Delay (d2), s/veh	1.6	0.3	0.8	8.4	0.2	0.4	0.3	0.0	1.1	0.3	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.6	3.1	0.9	1.9	2.2	0.4	0.0	0.5	0.5	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.7	7.6	8.1	31.0	6.2	6.4	22.0	0.0	21.5	20.7	0.0	20.4
LnGrp LOS	C	A	A	C	A	A	C	A	C	C	A	C
Approach Vol, veh/h		2231			1553			85			67	
Approach Delay, s/veh		8.0			7.3			21.7			20.6	
Approach LOS		A			A			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	7.5	32.0		9.5	6.2	33.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		19.5	5.5	31.5		19.5	5.1	31.9				
Max Q Clear Time (g_c+I1), s		4.9	4.1	13.5		3.5	2.5	10.6				
Green Ext Time (p_c), s		0.2	0.0	14.0		0.2	0.0	11.0				

Intersection Summary												
HCM 6th Ctrl Delay			8.2									
HCM 6th LOS			A									

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.996					0.865
Flt Protected						
Satd. Flow (prot)	4798	0	0	4818	0	1526
Flt Permitted						
Satd. Flow (perm)	4798	0	0	4818	0	1526
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	2114	63	0	1449	0	52
Future Volume (vph)	2114	63	0	1449	0	52
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	2202	66	0	1509	0	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2268	0	0	1509	0	54

Intersection Summary

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2114	63	0	1449	0	52
Future Vol, veh/h	2114	63	0	1449	0	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2202	66	0	1509	0	54

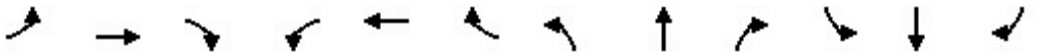
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1134
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	169
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	169
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	36
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	169	-	-	-
HCM Lane V/C Ratio	0.321	-	-	-
HCM Control Delay (s)	36	-	-	-
HCM Lane LOS	E	-	-	-
HCM 95th %tile Q(veh)	1.3	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5955	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5955	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			207			285			55		29	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



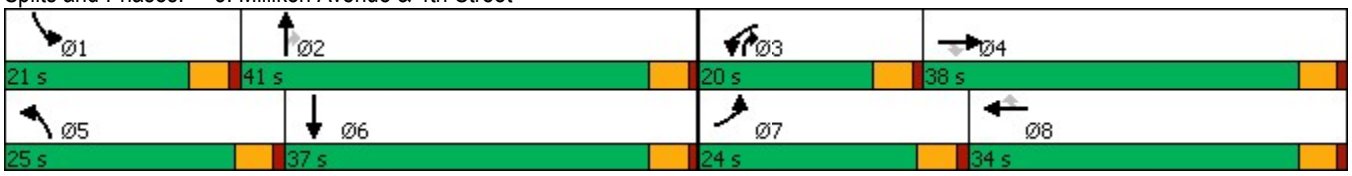
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	440	1316	279	391	1095	326	426	1651	386	462	1050	150
Future Volume (vph)	440	1316	279	391	1095	326	426	1651	386	462	1050	150
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	458	1371	291	407	1141	340	444	1720	402	481	1094	156
Shared Lane Traffic (%)												
Lane Group Flow (vph)	458	1371	291	407	1141	340	444	1720	402	481	1250	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	440	1316	279	391	1095	326	426	1651	386	462	1050
Future Volume (vph)	440	1316	279	391	1095	326	426	1651	386	462	1050
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	24.0	38.0	38.0	20.0	34.0	34.0	25.0	41.0	20.0	21.0	37.0
Total Split (%)	20.0%	31.7%	31.7%	16.7%	28.3%	28.3%	20.8%	34.2%	16.7%	17.5%	30.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	19.5	33.5	33.5	15.5	29.5	29.5	20.2	36.5	56.5	16.5	32.8
Actuated g/C Ratio	0.16	0.28	0.28	0.13	0.25	0.25	0.17	0.30	0.47	0.14	0.27
v/c Ratio	0.98	1.02	0.51	1.09	0.96	0.58	0.91	0.93	0.55	1.21	0.76
Control Delay	86.4	72.4	14.4	121.9	63.7	12.2	73.5	50.8	22.6	160.4	42.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.4	72.4	14.4	121.9	63.7	12.2	73.5	50.8	22.6	160.4	42.6
LOS	F	E	B	F	E	B	E	D	C	F	D
Approach Delay		67.4			67.0			50.3			75.3
Approach LOS		E			E			D			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.21	
Intersection Signal Delay: 63.7	Intersection LOS: E
Intersection Capacity Utilization 96.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 5: Milliken Avenue & 4th Street

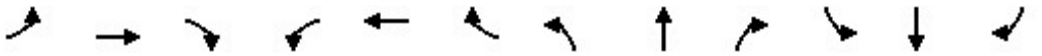


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	458	1371	291	407	1141	340	444	1720	402	481	1250
v/c Ratio	0.98	1.02	0.51	1.09	0.96	0.58	0.91	0.93	0.55	1.21	0.76
Control Delay	86.4	72.4	14.4	121.9	63.7	12.2	73.5	50.8	22.6	160.4	42.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.4	72.4	14.4	121.9	63.7	12.2	73.5	50.8	22.6	160.4	42.6
Queue Length 50th (ft)	184	~412	50	~182	321	34	175	375	186	~234	253
Queue Length 95th (ft)	#291	#509	136	#285	#418	126	#269	#450	285	#342	297
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	469	1345	567	373	1184	583	493	1846	735	397	1648
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	1.02	0.51	1.09	0.96	0.58	0.90	0.93	0.55	1.21	0.76

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

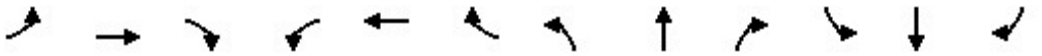
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	440	1316	279	391	1095	326	426	1651	386	462	1050	150
Future Volume (veh/h)	440	1316	279	391	1095	326	426	1651	386	462	1050	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	458	1371	291	407	1141	340	444	1720	402	481	1094	156
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	473	1352	420	376	1191	370	487	1849	650	401	1487	210
Arrive On Green	0.16	0.28	0.28	0.13	0.25	0.25	0.17	0.30	0.30	0.14	0.27	0.27
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	2910	6095	1502	2910	5436	769
Grp Volume(v), veh/h	458	1371	291	407	1141	340	444	1720	402	481	918	332
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1455	1524	1502	1455	1524	1634
Q Serve(g_s), s	18.7	33.5	20.8	15.5	27.9	26.4	18.0	32.8	24.9	16.5	21.9	22.2
Cycle Q Clear(g_c), s	18.7	33.5	20.8	15.5	27.9	26.4	18.0	32.8	24.9	16.5	21.9	22.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.47
Lane Grp Cap(c), veh/h	473	1352	420	376	1191	370	487	1849	650	401	1250	447
V/C Ratio(X)	0.97	1.01	0.69	1.08	0.96	0.92	0.91	0.93	0.62	1.20	0.73	0.74
Avail Cap(c_a), veh/h	473	1352	420	376	1191	370	498	1856	652	401	1250	447
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.9	43.2	38.6	52.2	44.6	44.0	49.0	40.5	26.3	51.7	39.6	39.7
Incr Delay (d2), s/veh	32.9	28.0	4.9	69.9	17.0	27.7	20.7	9.0	1.8	111.9	2.3	6.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	16.7	8.2	9.3	12.9	12.6	7.9	13.3	9.1	12.2	8.4	9.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.8	71.2	43.4	122.1	61.6	71.7	69.7	49.5	28.1	163.6	41.9	46.2
LnGrp LOS	F	F	D	F	E	E	E	D	C	F	D	D
Approach Vol, veh/h		2120			1888			2566			1731	
Approach Delay, s/veh		69.9			76.4			49.6			76.5	
Approach LOS		E			E			D			E	

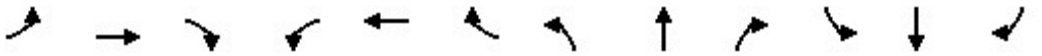
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	40.8	20.0	38.0	24.6	37.3	24.0	34.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	36.5	15.5	33.5	20.5	32.5	19.5	29.5
Max Q Clear Time (g_c+I1), s	18.5	34.8	17.5	35.5	20.0	24.2	20.7	29.9
Green Ext Time (p_c), s	0.0	1.5	0.0	0.0	0.1	5.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	66.5
HCM 6th LOS	E



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.920	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2955	1365
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	2955	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			121			196			262		229	390
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



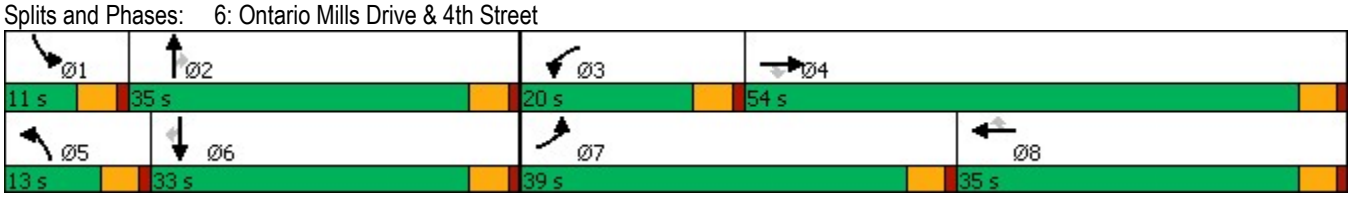
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	986	1463	120	244	1141	456	141	310	360	104	312	718
Future Volume (vph)	986	1463	120	244	1141	456	141	310	360	104	312	718
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1072	1590	130	265	1240	496	153	337	391	113	339	780
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	1072	1590	130	265	1240	496	153	337	391	113	729	390

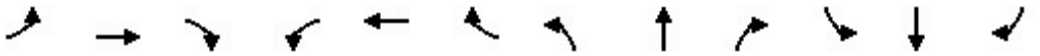
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	986	1463	120	244	1141	456	141	310	360	104	312	718
Future Volume (vph)	986	1463	120	244	1141	456	141	310	360	104	312	718
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	39.0	54.0	54.0	20.0	35.0	35.0	13.0	35.0	35.0	11.0	33.0	33.0
Total Split (%)	32.5%	45.0%	45.0%	16.7%	29.2%	29.2%	10.8%	29.2%	29.2%	9.2%	27.5%	27.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	34.5	50.7	50.7	14.3	30.5	30.5	8.5	28.7	28.7	6.5	26.7	26.7
Actuated g/C Ratio	0.29	0.43	0.43	0.12	0.26	0.26	0.07	0.24	0.24	0.05	0.23	0.23
v/c Ratio	1.27	0.77	0.18	0.76	1.00	0.93	1.34	0.41	0.70	1.31	0.86	0.64
Control Delay	167.0	32.5	5.3	64.8	69.2	52.1	245.3	39.3	20.4	243.7	41.5	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	167.0	32.5	5.3	64.8	69.2	52.1	245.3	39.3	20.4	243.7	41.5	9.1
LOS	F	C	A	E	E	D	F	D	C	F	D	A
Approach Delay		82.9			64.4			66.7			49.8	
Approach LOS		F			E			E			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 118.2	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.34	
Intersection Signal Delay: 69.5	Intersection LOS: E
Intersection Capacity Utilization 97.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 6: Ontario Mills Drive & 4th Street



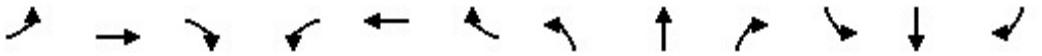


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1072	1590	130	265	1240	496	153	337	391	113	729	390
v/c Ratio	1.27	0.77	0.18	0.76	1.00	0.93	1.34	0.41	0.70	1.31	0.86	0.64
Control Delay	167.0	32.5	5.3	64.8	69.2	52.1	245.3	39.3	20.4	243.7	41.5	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	167.0	32.5	5.3	64.8	69.2	52.1	245.3	39.3	20.4	243.7	41.5	9.1
Queue Length 50th (ft)	~545	389	4	103	~360	248	~156	114	87	~113	209	0
Queue Length 95th (ft)	#676	452	42	150	#465	#466	#293	159	204	#234	292	97
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	844	2065	712	379	1243	532	114	865	581	86	886	625
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.27	0.77	0.18	0.70	1.00	0.93	1.34	0.39	0.67	1.31	0.82	0.62

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



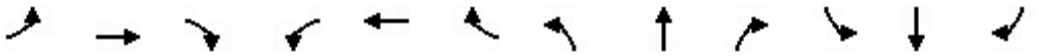
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	986	1463	120	244	1141	456	141	310	360	104	312	718
Future Volume (veh/h)	986	1463	120	244	1141	456	141	310	360	104	312	718
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	1072	1590	130	265	1240	496	153	337	391	113	339	780
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	837	2097	651	315	1229	382	113	856	382	86	421	713
Arrive On Green	0.29	0.43	0.43	0.11	0.25	0.25	0.07	0.25	0.25	0.05	0.24	0.24
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	1594	3367	1502	1594	1772	3003
Grp Volume(v), veh/h	1072	1590	130	265	1240	496	153	337	391	113	339	780
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1594	1683	1502	1594	1772	1502
Q Serve(g_s), s	34.5	33.3	6.4	10.7	30.5	30.5	8.5	10.0	30.5	6.5	21.6	28.5
Cycle Q Clear(g_c), s	34.5	33.3	6.4	10.7	30.5	30.5	8.5	10.0	30.5	6.5	21.6	28.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	837	2097	651	315	1229	382	113	856	382	86	421	713
V/C Ratio(X)	1.28	0.76	0.20	0.84	1.01	1.30	1.36	0.39	1.02	1.31	0.81	1.09
Avail Cap(c_a), veh/h	837	2097	651	376	1229	382	113	856	382	86	421	713
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.8	28.7	21.1	52.5	44.8	44.8	55.8	37.1	44.8	56.8	43.1	45.7
Incr Delay (d2), s/veh	135.7	1.6	0.1	13.8	27.8	152.9	206.9	0.3	52.5	200.3	10.9	62.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	28.0	13.0	2.3	4.5	15.2	27.4	9.9	4.1	16.8	7.4	10.7	16.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	178.5	30.3	21.2	66.3	72.5	197.6	262.6	37.4	97.2	257.1	54.1	107.8
LnGrp LOS	F	C	C	E	F	F	F	D	F	F	D	F
Approach Vol, veh/h		2792			2001			881			1232	
Approach Delay, s/veh		86.8			102.7			103.0			106.7	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	35.0	17.5	56.5	13.0	33.0	39.0	35.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	30.5	15.5	49.5	8.5	28.5	34.5	30.5
Max Q Clear Time (g_c+I1), s	8.5	32.5	12.7	35.3	10.5	30.5	36.5	32.5
Green Ext Time (p_c), s	0.0	0.0	0.3	9.7	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	97.0
HCM 6th LOS	F

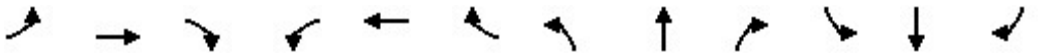
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.973			0.940				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.978	
Satd. Flow (prot)	2891	4818	1500	1583	4688	0	1583	3152	0	1504	1640	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.978	
Satd. Flow (perm)	2891	4818	1500	1583	4688	0	1583	3152	0	1504	1640	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			123		37			60				217
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



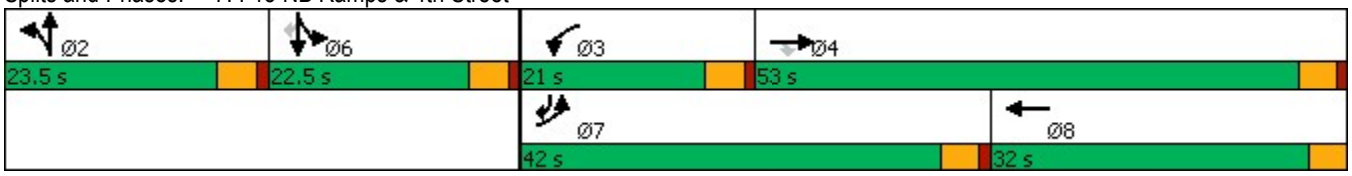
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	944	847	131	79	997	216	152	85	58	197	76	676
Future Volume (vph)	944	847	131	79	997	216	152	85	58	197	76	676
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	983	882	136	82	1039	225	158	89	60	205	79	704
Shared Lane Traffic (%)										32%		
Lane Group Flow (vph)	983	882	136	82	1264	0	158	149	0	139	145	704

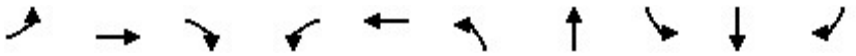
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	944	847	131	79	997	152	85	197	76	676
Future Volume (vph)	944	847	131	79	997	152	85	197	76	676
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	42.0	53.0	53.0	21.0	32.0	23.5	23.5	22.5	22.5	42.0
Total Split (%)	35.0%	44.2%	44.2%	17.5%	26.7%	19.6%	19.6%	18.8%	18.8%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	37.6	56.5	56.5	11.2	28.6	15.5	15.5	14.6	14.6	56.8
Actuated g/C Ratio	0.33	0.50	0.50	0.10	0.25	0.14	0.14	0.13	0.13	0.50
v/c Ratio	1.03	0.37	0.17	0.53	1.05	0.73	0.31	0.72	0.69	0.49
Control Delay	74.1	20.4	5.4	61.4	79.2	67.6	28.1	68.8	64.7	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.1	20.4	5.4	61.4	79.2	67.6	28.1	68.8	64.7	13.9
LOS	E	C	A	E	E	E	C	E	E	B
Approach Delay		45.8			78.1		48.4		29.1	
Approach LOS		D			E		D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 113.4	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 51.8	Intersection LOS: D
Intersection Capacity Utilization 89.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street



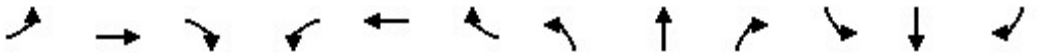


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	983	882	136	82	1264	158	149	139	145	704
v/c Ratio	1.03	0.37	0.17	0.53	1.05	0.73	0.31	0.72	0.69	0.49
Control Delay	74.1	20.4	5.4	61.4	79.2	67.6	28.1	68.8	64.7	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.1	20.4	5.4	61.4	79.2	67.6	28.1	68.8	64.7	13.9
Queue Length 50th (ft)	~410	153	5	59	~374	113	31	105	109	128
Queue Length 95th (ft)	#571	219	45	111	#499	190	63	182	185	190
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	959	2399	808	231	1209	266	579	239	261	1430
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.37	0.17	0.35	1.05	0.59	0.26	0.58	0.56	0.49

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	944	847	131	79	997	216	152	85	58	197	76	676
Future Volume (veh/h)	944	847	131	79	997	216	152	85	58	197	76	676
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	983	882	136	82	1039	225	158	89	60	142	167	704
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	942	2446	759	102	979	212	191	238	148	248	275	1439
Arrive On Green	0.32	0.51	0.51	0.06	0.25	0.25	0.12	0.12	0.12	0.16	0.16	0.16
Sat Flow, veh/h	2910	4837	1502	1594	3981	861	1594	1992	1240	1594	1772	3003
Grp Volume(v), veh/h	983	882	136	82	841	423	158	74	75	142	167	704
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1594	1612	1617	1594	1683	1549	1594	1772	1502
Q Serve(g_s), s	37.5	12.8	5.7	5.9	28.5	28.5	11.2	4.7	5.2	9.6	10.2	18.0
Cycle Q Clear(g_c), s	37.5	12.8	5.7	5.9	28.5	28.5	11.2	4.7	5.2	9.6	10.2	18.0
Prop In Lane	1.00		1.00	1.00		0.53	1.00		0.80	1.00		1.00
Lane Grp Cap(c), veh/h	942	2446	759	102	793	398	191	201	185	248	275	1439
V/C Ratio(X)	1.04	0.36	0.18	0.80	1.06	1.06	0.83	0.37	0.40	0.57	0.61	0.49
Avail Cap(c_a), veh/h	942	2446	759	227	793	398	261	276	254	248	275	1439
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.2	17.3	15.6	53.5	43.7	43.7	49.8	47.0	47.2	45.4	45.6	20.5
Incr Delay (d2), s/veh	41.4	0.1	0.1	13.6	49.3	62.6	14.6	1.1	1.4	3.2	3.8	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.6	4.7	2.0	2.7	16.7	18.2	5.2	2.0	2.1	4.0	4.8	6.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.5	17.4	15.7	67.1	93.0	106.3	64.4	48.1	48.6	48.6	49.4	20.8
LnGrp LOS	F	B	B	E	F	F	E	D	D	D	D	C
Approach Vol, veh/h		2001			1346			307			1013	
Approach Delay, s/veh		48.3			95.6			56.6			29.4	
Approach LOS		D			F			E			C	

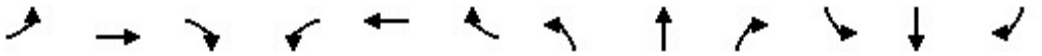
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		18.4	11.9	63.1		22.5	42.0	33.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		19.0	16.5	48.5		18.0	37.5	* 29				
Max Q Clear Time (g_c+I1), s		13.2	7.9	14.8		20.0	39.5	30.5				
Green Ext Time (p_c), s		0.6	0.1	7.9		0.0	0.0	0.0				

Intersection Summary		
HCM 6th Ctrl Delay		58.4
HCM 6th LOS		E

Notes

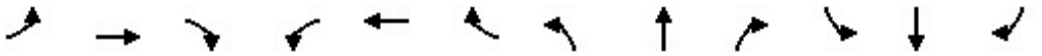
User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.907				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3041	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3041	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		66				149			149			149
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



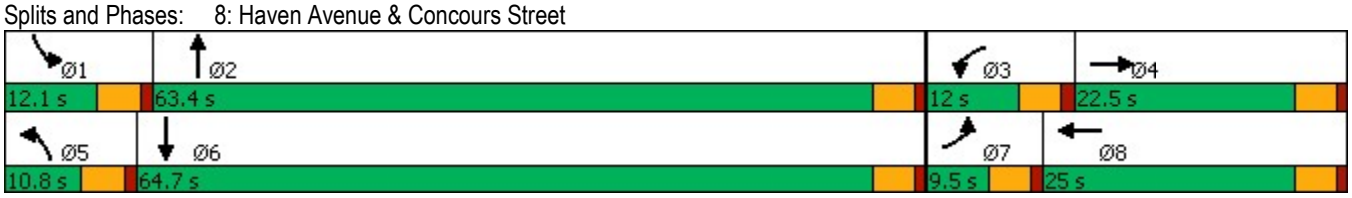
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	26	40	65	226	95	97	48	2594	258	178	2199	28
Future Volume (vph)	26	40	65	226	95	97	48	2594	258	178	2199	28
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	27	41	66	231	97	99	49	2647	263	182	2244	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	107	0	231	97	99	49	2647	263	182	2244	29

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	26	40	226	95	97	48	2594	258	178	2199	28
Future Volume (vph)	26	40	226	95	97	48	2594	258	178	2199	28
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	12.0	25.0		10.8	63.4		12.1	64.7	
Total Split (%)	8.6%	20.5%	10.9%	22.7%		9.8%	57.6%		11.0%	58.8%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.0	7.0	7.5	13.4	99.0	6.1	58.9	99.0	7.6	62.4	99.0
Actuated g/C Ratio	0.05	0.07	0.08	0.14	1.00	0.06	0.59	1.00	0.08	0.63	1.00
v/c Ratio	0.19	0.39	0.78	0.21	0.07	0.27	0.73	0.18	0.82	0.59	0.02
Control Delay	48.8	23.9	63.6	41.3	0.1	48.8	16.1	0.3	74.3	12.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	23.9	63.6	41.3	0.1	48.8	16.1	0.3	74.3	12.1	0.0
LOS	D	C	E	D	A	D	B	A	E	B	A
Approach Delay		28.9		43.8			15.3			16.6	
Approach LOS		C		D			B			B	

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 99	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 18.2	Intersection LOS: B
Intersection Capacity Utilization 69.1%	ICU Level of Service C
Analysis Period (min) 15	

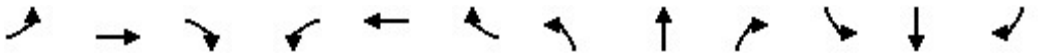
Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	27	107	231	97	99	49	2647	263	182	2244	29
v/c Ratio	0.19	0.39	0.78	0.21	0.07	0.27	0.73	0.18	0.82	0.59	0.02
Control Delay	48.8	23.9	63.6	41.3	0.1	48.8	16.1	0.3	74.3	12.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	23.9	63.6	41.3	0.1	48.8	16.1	0.3	74.3	12.1	0.0
Queue Length 50th (ft)	8	13	51	30	0	15	321	0	59	234	0
Queue Length 95th (ft)	23	39	#93	56	0	35	391	0	#121	288	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	145	606	298	693	1500	183	3611	1500	221	3825	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.18	0.78	0.14	0.07	0.27	0.73	0.18	0.82	0.59	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



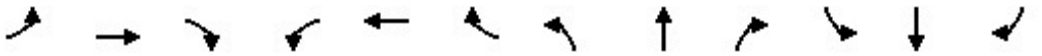
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	40	65	226	95	97	48	2594	258	178	2199	28
Future Volume (veh/h)	26	40	65	226	95	97	48	2594	258	178	2199	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	27	41	66	231	97	0	49	2647	0	182	2244	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	78	114	102	309	400		111	3564		233	3819	
Arrive On Green	0.03	0.07	0.07	0.08	0.12	0.00	0.04	0.58	0.00	0.08	0.63	0.00
Sat Flow, veh/h	2910	1683	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	27	41	66	231	97	0	49	2647	0	182	2244	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	0.9	2.2	4.1	5.4	2.5	0.0	1.6	30.3	0.0	5.8	20.7	0.0
Cycle Q Clear(g_c), s	0.9	2.2	4.1	5.4	2.5	0.0	1.6	30.3	0.0	5.8	20.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	78	114	102	309	400		111	3564		233	3819	
V/C Ratio(X)	0.35	0.36	0.65	0.75	0.24		0.44	0.74		0.78	0.59	
Avail Cap(c_a), veh/h	153	319	285	313	727		193	3783		233	3866	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	45.4	42.3	43.2	42.8	37.9	0.0	44.7	14.5	0.0	42.8	10.5	0.0
Incr Delay (d2), s/veh	2.6	1.9	6.8	9.3	0.3	0.0	2.7	0.8	0.0	15.6	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.0	1.7	2.0	1.0	0.0	0.6	9.6	0.0	2.6	6.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.0	44.2	50.0	52.2	38.3	0.0	47.4	15.2	0.0	58.5	10.7	0.0
LnGrp LOS	D	D	D	D	D		D	B		E	B	
Approach Vol, veh/h		134			328	A		2696	A		2426	A
Approach Delay, s/veh		47.8			48.0			15.8			14.3	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.1	60.0	11.9	10.9	8.1	64.0	7.0	15.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.6	58.9	7.5	18.0	6.3	60.2	5.0	20.5
Max Q Clear Time (g_c+I1), s	7.8	32.3	7.4	6.1	3.6	22.7	2.9	4.5
Green Ext Time (p_c), s	0.0	23.2	0.0	0.4	0.0	26.5	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	17.8
HCM 6th LOS	B

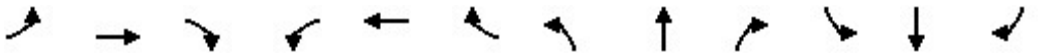
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.980			0.951						0.980	
Flt Protected	0.950	0.958			0.969		0.950			0.950		
Satd. Flow (prot)	1593	1574	0	0	1626	0	1676	4818	0	1676	4721	0
Flt Permitted	0.950	0.958					0.950			0.950		
Satd. Flow (perm)	1593	1574	0	0	1678	0	1676	4818	0	1676	4721	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		95			95						34	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



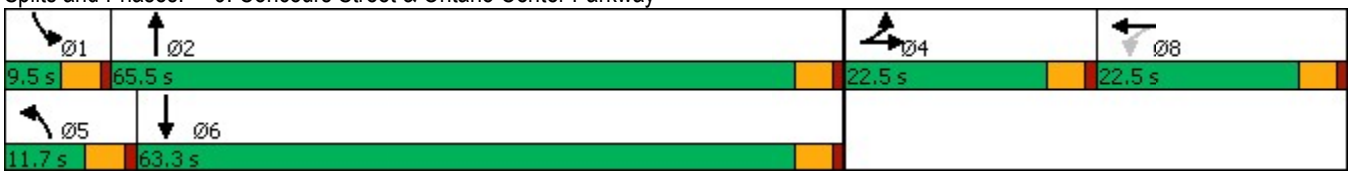
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	173	0	12	15	0	9	34	1803	5	1	1088	167
Future Volume (vph)	173	0	12	15	0	9	34	1803	5	1	1088	167
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	182	0	13	16	0	9	36	1898	5	1	1145	176
Shared Lane Traffic (%)	46%											
Lane Group Flow (vph)	98	97	0	0	25	0	36	1903	0	1	1321	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	173	0	15	0	34	1803	1	1088
Future Volume (vph)	173	0	15	0	34	1803	1	1088
Turn Type	Split	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	4	4		8	5	2	1	6
Permitted Phases			8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	11.7	65.5	9.5	63.3
Total Split (%)	18.8%	18.8%	18.8%	18.8%	9.8%	54.6%	7.9%	52.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	11.0	11.0		5.8	6.9	52.7	5.3	47.8
Actuated g/C Ratio	0.14	0.14		0.07	0.09	0.68	0.07	0.62
v/c Ratio	0.44	0.32		0.12	0.24	0.58	0.01	0.45
Control Delay	41.3	12.2		1.1	44.4	9.2	45.0	10.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	12.2		1.1	44.4	9.2	45.0	10.3
LOS	D	B		A	D	A	D	B
Approach Delay		26.8		1.1		9.8		10.3
Approach LOS		C		A		A		B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 77.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 10.9	Intersection LOS: B
Intersection Capacity Utilization 52.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	98	97	25	36	1903	1	1321
v/c Ratio	0.44	0.32	0.12	0.24	0.58	0.01	0.45
Control Delay	41.3	12.2	1.1	44.4	9.2	45.0	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	12.2	1.1	44.4	9.2	45.0	10.3
Queue Length 50th (ft)	42	1	0	15	111	0	115
Queue Length 95th (ft)	118	50	0	58	364	7	224
Internal Link Dist (ft)		319	68		111		176
Turn Bay Length (ft)	170			115		120	
Base Capacity (vph)	389	456	481	163	3945	113	3772
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.21	0.05	0.22	0.48	0.01	0.35

Intersection Summary

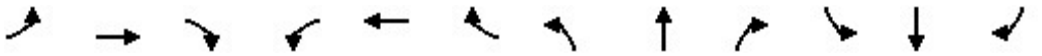
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	0	12	15	0	9	34	1803	5	1	1088	167
Future Volume (veh/h)	173	0	12	15	0	9	34	1803	5	1	1088	167
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	194	0	0	16	0	9	36	1898	5	1	1145	176
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	306	161	0	29	0	16	62	3017	8	3	2413	371
Arrive On Green	0.09	0.00	0.00	0.03	0.00	0.03	0.04	0.61	0.61	0.00	0.57	0.57
Sat Flow, veh/h	3375	1772	0	1034	0	582	1688	4981	13	1688	4230	650
Grp Volume(v), veh/h	194	0	0	25	0	0	36	1229	674	1	873	448
Grp Sat Flow(s),veh/h/ln	1688	1772	0	1616	0	0	1688	1612	1770	1688	1612	1655
Q Serve(g_s), s	3.6	0.0	0.0	1.0	0.0	0.0	1.4	15.9	15.9	0.0	10.5	10.5
Cycle Q Clear(g_c), s	3.6	0.0	0.0	1.0	0.0	0.0	1.4	15.9	15.9	0.0	10.5	10.5
Prop In Lane	1.00		0.00	0.64		0.36	1.00		0.01	1.00		0.39
Lane Grp Cap(c), veh/h	306	161	0	45	0	0	62	1954	1072	3	1840	944
V/C Ratio(X)	0.63	0.00	0.00	0.55	0.00	0.00	0.58	0.63	0.63	0.39	0.47	0.47
Avail Cap(c_a), veh/h	926	486	0	443	0	0	185	2999	1646	129	2891	1483
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.8	0.0	0.0	31.5	0.0	0.0	31.1	8.2	8.2	32.7	8.3	8.3
Incr Delay (d2), s/veh	2.2	0.0	0.0	10.2	0.0	0.0	8.4	0.3	0.6	75.4	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	0.5	0.0	0.0	0.7	4.4	4.9	0.1	3.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.0	0.0	0.0	41.7	0.0	0.0	39.5	8.6	8.8	108.2	8.5	8.7
LnGrp LOS	C	A	A	D	A	A	D	A	A	F	A	A
Approach Vol, veh/h		194			25			1939			1322	
Approach Delay, s/veh		31.0			41.7			9.2			8.6	
Approach LOS		C			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	44.2		10.4	6.9	41.9		6.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	61.0		18.0	7.2	58.8		18.0				
Max Q Clear Time (g_c+I1), s	2.0	17.9		5.6	3.4	12.5		3.0				
Green Ext Time (p_c), s	0.0	21.8		0.5	0.0	12.8		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		10.5	
HCM 6th LOS		B	

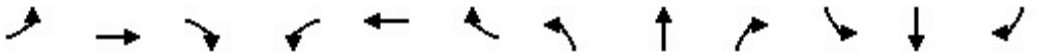
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			245			193			193			193
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



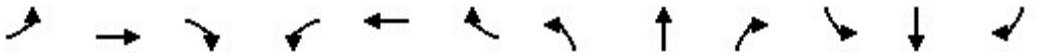
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	376	133	235	185	69	168	295	1880	141	214	1386	174
Future Volume (vph)	376	133	235	185	69	168	295	1880	141	214	1386	174
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	392	139	245	193	72	175	307	1958	147	223	1444	181
Shared Lane Traffic (%)												
Lane Group Flow (vph)	392	139	245	193	72	175	307	1958	147	223	1444	181

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	376	133	235	185	69	168	295	1880	141	214	1386	174
Future Volume (vph)	376	133	235	185	69	168	295	1880	141	214	1386	174
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	24.1	26.7		19.9	22.5		19.8	48.4		15.0	43.6	
Total Split (%)	21.9%	24.3%		18.1%	20.5%		18.0%	44.0%		13.6%	39.6%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	18.9	12.2	95.1	11.7	7.5	95.1	14.1	42.7	95.1	10.3	38.9	95.1
Actuated g/C Ratio	0.20	0.13	1.00	0.12	0.08	1.00	0.15	0.45	1.00	0.11	0.41	1.00
v/c Ratio	0.69	0.32	0.16	0.54	0.27	0.12	0.72	0.72	0.10	0.71	0.58	0.12
Control Delay	43.6	40.6	0.2	46.0	45.7	0.2	49.8	23.7	0.1	56.0	23.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.6	40.6	0.2	46.0	45.7	0.2	49.8	23.7	0.1	56.0	23.7	0.2
LOS	D	D	A	D	D	A	D	C	A	E	C	A
Approach Delay		29.4			27.7			25.6			25.3	
Approach LOS		C			C			C			C	

Intersection Summary		
Cycle Length: 110		
Actuated Cycle Length: 95.1		
Natural Cycle: 90		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.72		
Intersection Signal Delay: 26.2	Intersection LOS: C	
Intersection Capacity Utilization 67.9%	ICU Level of Service C	
Analysis Period (min) 15		

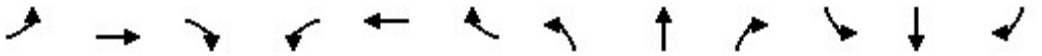
Splits and Phases: 10: Milliken Avenue & Concours Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	392	139	245	193	72	175	307	1958	147	223	1444	181
v/c Ratio	0.69	0.32	0.16	0.54	0.27	0.12	0.72	0.72	0.10	0.71	0.58	0.12
Control Delay	43.6	40.6	0.2	46.0	45.7	0.2	49.8	23.7	0.1	56.0	23.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.6	40.6	0.2	46.0	45.7	0.2	49.8	23.7	0.1	56.0	23.7	0.2
Queue Length 50th (ft)	120	41	0	59	22	0	94	283	0	71	204	0
Queue Length 95th (ft)	174	73	0	94	45	0	145	346	0	#127	254	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	600	788	1500	471	639	1500	469	2824	1500	321	2533	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.18	0.16	0.41	0.11	0.12	0.65	0.69	0.10	0.69	0.57	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



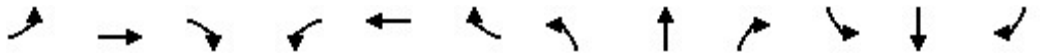
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	376	133	235	185	69	168	295	1880	141	214	1386	174
Future Volume (veh/h)	376	133	235	185	69	168	295	1880	141	214	1386	174
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	392	139	0	193	72	0	307	1958	0	223	1444	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	478	446		268	203		384	2798		291	2603	
Arrive On Green	0.16	0.13	0.00	0.09	0.06	0.00	0.13	0.46	0.00	0.10	0.43	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	392	139	0	193	72	0	307	1958	0	223	1444	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	10.8	3.1	0.0	5.4	1.7	0.0	8.5	21.3	0.0	6.2	14.8	0.0
Cycle Q Clear(g_c), s	10.8	3.1	0.0	5.4	1.7	0.0	8.5	21.3	0.0	6.2	14.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	478	446		268	203		384	2798		291	2603	
V/C Ratio(X)	0.82	0.31		0.72	0.36		0.80	0.70		0.77	0.55	
Avail Cap(c_a), veh/h	686	899		539	729		536	3220		368	2868	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.6	32.6	0.0	36.7	37.5	0.0	35.0	17.9	0.0	36.4	17.9	0.0
Incr Delay (d2), s/veh	5.3	0.4	0.0	3.7	1.1	0.0	5.8	0.6	0.0	7.2	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	1.3	0.0	2.0	0.7	0.0	3.3	7.0	0.0	2.5	4.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.9	33.0	0.0	40.4	38.6	0.0	40.8	18.5	0.0	43.7	18.1	0.0
LnGrp LOS	D	C		D	D		D	B		D	B	
Approach Vol, veh/h		531	A		265	A		2265	A		1667	A
Approach Delay, s/veh		37.3			39.9			21.5			21.5	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.8	42.6	12.1	15.5	15.5	40.0	18.1	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	43.9	15.4	22.2	15.3	39.1	19.6	18.0
Max Q Clear Time (g_c+I1), s	8.2	23.3	7.4	5.1	10.5	16.8	12.8	3.7
Green Ext Time (p_c), s	0.2	14.9	0.4	0.7	0.5	11.5	0.8	0.2

Intersection Summary	
HCM 6th Ctrl Delay	24.3
HCM 6th LOS	C

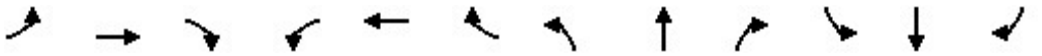
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55			177			219			177
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



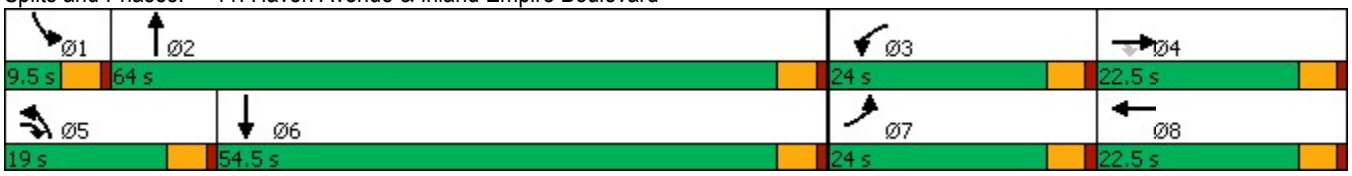
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	278	241	538	638	181	41	414	2094	435	42	2439	151
Future Volume (vph)	278	241	538	638	181	41	414	2094	435	42	2439	151
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	299	259	578	686	195	44	445	2252	468	45	2623	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	299	259	578	686	195	44	445	2252	468	45	2623	162

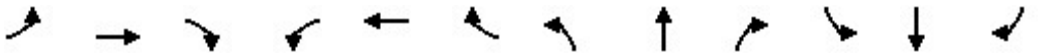
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	278	241	538	638	181	41	414	2094	435	42	2439	151
Future Volume (vph)	278	241	538	638	181	41	414	2094	435	42	2439	151
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	24.0	22.5	19.0	24.0	22.5		19.0	64.0		9.5	54.5	
Total Split (%)	20.0%	18.8%	15.8%	20.0%	18.8%		15.8%	53.3%		7.9%	45.4%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	16.6	14.1	33.1	19.5	17.1	116.2	14.5	61.5	116.2	5.0	50.0	116.2
Actuated g/C Ratio	0.14	0.12	0.28	0.17	0.15	1.00	0.12	0.53	1.00	0.04	0.43	1.00
v/c Ratio	0.73	0.64	1.24	1.04	0.40	0.03	1.23	0.70	0.31	0.36	1.00	0.11
Control Delay	58.4	56.0	158.1	92.3	48.1	0.0	169.8	22.7	0.5	63.5	51.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.4	56.0	158.1	92.3	48.1	0.0	169.8	22.7	0.5	63.5	51.8	0.1
LOS	E	E	F	F	D	A	F	C	A	E	D	A
Approach Delay		108.6			78.6			40.1			49.1	
Approach LOS		F			E			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 116.2	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.24	
Intersection Signal Delay: 57.3	Intersection LOS: E
Intersection Capacity Utilization 99.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	299	259	578	686	195	44	445	2252	468	45	2623	162
v/c Ratio	0.73	0.64	1.24	1.04	0.40	0.03	1.23	0.70	0.31	0.36	1.00	0.11
Control Delay	58.4	56.0	158.1	92.3	48.1	0.0	169.8	22.7	0.5	63.5	51.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.4	56.0	158.1	92.3	48.1	0.0	169.8	22.7	0.5	63.5	51.8	0.1
Queue Length 50th (ft)	111	98	~508	~196	71	0	~212	366	0	17	~565	0
Queue Length 95th (ft)	161	143	#725	#291	111	0	#329	440	0	38	#708	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	485	519	466	661	519	1500	361	3214	1500	124	2614	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.50	1.24	1.04	0.38	0.03	1.23	0.70	0.31	0.36	1.00	0.11

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

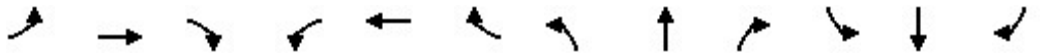
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	278	241	538	638	181	41	414	2094	435	42	2439	151
Future Volume (veh/h)	278	241	538	638	181	41	414	2094	435	42	2439	151
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	299	259	578	686	195	0	445	2252	0	45	2623	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	353	505	407	644	643		352	3079		94	2540	
Arrive On Green	0.12	0.15	0.15	0.16	0.19	0.00	0.12	0.51	0.00	0.03	0.42	0.00
Sat Flow, veh/h	2910	3367	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	299	259	578	686	195	0	445	2252	0	45	2623	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	12.1	8.5	18.0	19.5	6.0	0.0	14.5	34.8	0.0	1.8	50.0	0.0
Cycle Q Clear(g_c), s	12.1	8.5	18.0	19.5	6.0	0.0	14.5	34.8	0.0	1.8	50.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	353	505	407	644	643		352	3079		94	2540	
V/C Ratio(X)	0.85	0.51	1.42	1.06	0.30		1.27	0.73		0.48	1.03	
Avail Cap(c_a), veh/h	473	505	407	644	643		352	3079		121	2540	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	51.6	47.0	43.8	50.2	41.7	0.0	52.8	23.3	0.0	57.1	35.0	0.0
Incr Delay (d2), s/veh	10.3	0.9	203.5	53.9	0.3	0.0	140.3	0.9	0.0	3.7	27.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	3.6	34.9	9.6	2.5	0.0	12.1	12.3	0.0	0.7	22.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.9	47.8	247.2	104.1	41.9	0.0	193.0	24.2	0.0	60.8	62.0	0.0
LnGrp LOS	E	D	F	F	D		F	C		E	F	
Approach Vol, veh/h		1136			881	A		2697	A		2668	A
Approach Delay, s/veh		153.0			90.4			52.1			61.9	
Approach LOS		F			F			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	65.1	24.0	22.5	19.0	54.5	19.1	27.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	59.5	19.5	18.0	14.5	50.0	19.5	18.0
Max Q Clear Time (g_c+I1), s	3.8	36.8	21.5	20.0	16.5	52.0	14.1	8.0
Green Ext Time (p_c), s	0.0	18.0	0.0	0.0	0.0	0.0	0.5	0.8

Intersection Summary	
HCM 6th Ctrl Delay	75.7
HCM 6th LOS	E

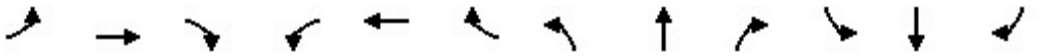
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			340			177			177			177
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



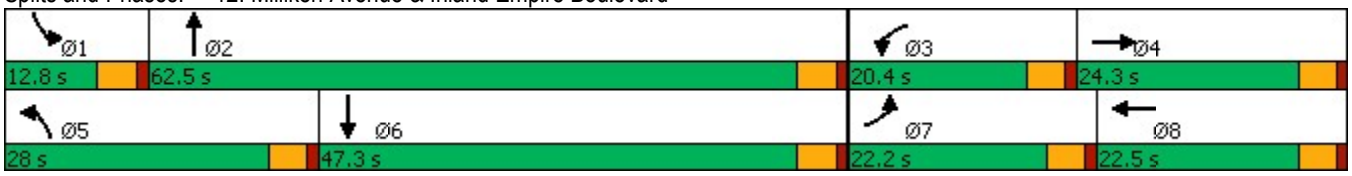
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	305	298	323	212	90	137	391	1845	365	127	1593	131
Future Volume (vph)	305	298	323	212	90	137	391	1845	365	127	1593	131
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	321	314	340	223	95	144	412	1942	384	134	1677	138
Shared Lane Traffic (%)												
Lane Group Flow (vph)	321	314	340	223	95	144	412	1942	384	134	1677	138

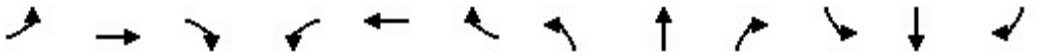
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	298	323	212	90	137	391	1845	365	127	1593	131
Future Volume (vph)	305	298	323	212	90	137	391	1845	365	127	1593	131
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	22.2	24.3		20.4	22.5		28.0	62.5		12.8	47.3	
Total Split (%)	18.5%	20.3%		17.0%	18.8%		23.3%	52.1%		10.7%	39.4%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	19.2	15.4	107.9	13.3	12.2	107.9	19.9	52.7	107.9	8.2	41.1	107.9
Actuated g/C Ratio	0.18	0.14	1.00	0.12	0.11	1.00	0.18	0.49	1.00	0.08	0.38	1.00
v/c Ratio	0.63	0.66	0.23	0.63	0.25	0.10	0.77	0.65	0.26	0.61	0.73	0.09
Control Delay	50.6	52.0	0.3	55.1	46.7	0.1	53.8	22.3	0.4	64.0	31.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.6	52.0	0.3	55.1	46.7	0.1	53.8	22.3	0.4	64.0	31.7	0.1
LOS	D	D	A	E	D	A	D	C	A	E	C	A
Approach Delay		33.5			36.3			24.0			31.7	
Approach LOS		C			D			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 107.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 28.9	Intersection LOS: C
Intersection Capacity Utilization 68.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	321	314	340	223	95	144	412	1942	384	134	1677	138
v/c Ratio	0.63	0.66	0.23	0.63	0.25	0.10	0.77	0.65	0.26	0.61	0.73	0.09
Control Delay	50.6	52.0	0.3	55.1	46.7	0.1	53.8	22.3	0.4	64.0	31.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.6	52.0	0.3	55.1	46.7	0.1	53.8	22.3	0.4	64.0	31.7	0.1
Queue Length 50th (ft)	117	116	0	81	34	0	149	289	0	50	295	0
Queue Length 95th (ft)	#183	168	0	127	61	0	213	364	0	#94	379	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	527	626	1500	433	569	1500	640	3321	1500	226	2474	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.50	0.23	0.52	0.17	0.10	0.64	0.58	0.26	0.59	0.68	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	305	298	323	212	90	137	391	1845	365	127	1593	131
Future Volume (veh/h)	305	298	323	212	90	137	391	1845	365	127	1593	131
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	321	314	0	223	95	0	412	1942	0	134	1677	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	397	430		295	312		499	3057		192	2415	
Arrive On Green	0.14	0.13	0.00	0.10	0.09	0.00	0.17	0.50	0.00	0.07	0.40	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	321	314	0	223	95	0	412	1942	0	134	1677	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	9.5	7.9	0.0	6.6	2.3	0.0	12.1	20.6	0.0	4.0	20.3	0.0
Cycle Q Clear(g_c), s	9.5	7.9	0.0	6.6	2.3	0.0	12.1	20.6	0.0	4.0	20.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	397	430		295	312		499	3057		192	2415	
V/C Ratio(X)	0.81	0.73		0.76	0.30		0.83	0.64		0.70	0.69	
Avail Cap(c_a), veh/h	582	753		523	685		773	3995		273	2948	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	37.1	37.1	0.0	38.7	37.5	0.0	35.4	16.1	0.0	40.5	22.3	0.0
Incr Delay (d2), s/veh	5.3	2.4	0.0	3.9	0.5	0.0	4.4	0.2	0.0	4.5	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	3.4	0.0	2.5	1.0	0.0	4.5	6.7	0.0	1.5	7.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.4	39.6	0.0	42.6	38.0	0.0	39.8	16.4	0.0	45.0	22.8	0.0
LnGrp LOS	D	D		D	D		D	B		D	C	
Approach Vol, veh/h		635	A		318	A		2354	A		1811	A
Approach Delay, s/veh		41.0			41.2			20.5			24.4	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	48.9	13.5	15.8	19.7	39.6	16.6	12.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.3	58.0	15.9	19.8	23.5	42.8	17.7	18.0
Max Q Clear Time (g_c+I1), s	6.0	22.6	8.6	9.9	14.1	22.3	11.5	4.3
Green Ext Time (p_c), s	0.1	21.3	0.4	1.4	1.1	12.8	0.6	0.4

Intersection Summary	
HCM 6th Ctrl Delay	25.7
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.982	0.850				
Flt Protected	0.958					
Satd. Flow (prot)	3042	1365	6071	0	0	6071
Flt Permitted	0.958					
Satd. Flow (perm)	3042	1365	6071	0	0	6071
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	2	2				
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	502	328	2478	0	0	2428
Future Volume (vph)	502	328	2478	0	0	2428
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	523	342	2581	0	0	2529
Shared Lane Traffic (%)		21%				
Lane Group Flow (vph)	595	270	2581	0	0	2529

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	502	328	2478	2428
Future Volume (vph)	502	328	2478	2428
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	41.0	41.0
Total Split (%)	36.9%	36.9%	63.1%	63.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	16.8	16.8	36.6	36.6
Actuated g/C Ratio	0.27	0.27	0.59	0.59
v/c Ratio	0.73	0.74	0.72	0.71
Control Delay	26.3	33.7	11.2	11.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	26.3	33.7	11.2	11.0
LOS	C	C	B	B
Approach Delay	28.6		11.2	11.0
Approach LOS	C		B	B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 62.4	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 13.6	Intersection LOS: B
Intersection Capacity Utilization 70.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	595	270	2581	2529
v/c Ratio	0.73	0.74	0.72	0.71
Control Delay	26.3	33.7	11.2	11.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	26.3	33.7	11.2	11.0
Queue Length 50th (ft)	104	101	195	188
Queue Length 95th (ft)	154	#194	249	241
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	955	429	3562	3562
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.62	0.63	0.72	0.71

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

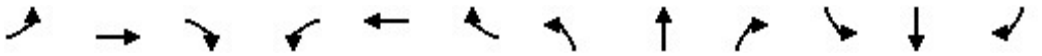
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	502	328	2478	0	0	2428
Future Volume (veh/h)	502	328	2478	0	0	2428
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1673	1772	1772	0	0	1772
Adj Flow Rate, veh/h	573	288	2581	0	0	2529
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	791	373	3639	0	0	3639
Arrive On Green	0.25	0.25	0.60	0.00	0.00	0.60
Sat Flow, veh/h	3188	1502	6592	0	0	6592
Grp Volume(v), veh/h	573	288	2581	0	0	2529
Grp Sat Flow(s),veh/h/ln	1594	1502	1524	0	0	1524
Q Serve(g_s), s	9.6	10.4	17.2	0.0	0.0	16.6
Cycle Q Clear(g_c), s	9.6	10.4	17.2	0.0	0.0	16.6
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	791	373	3639	0	0	3639
V/C Ratio(X)	0.72	0.77	0.71	0.00	0.00	0.69
Avail Cap(c_a), veh/h	1068	503	3824	0	0	3824
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	20.0	20.3	8.2	0.0	0.0	8.1
Incr Delay (d2), s/veh	1.6	5.1	0.6	0.0	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	3.8	4.2	0.0	0.0	4.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.6	25.5	8.8	0.0	0.0	8.6
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	861		2581			2529
Approach Delay, s/veh	22.9		8.8			8.6
Approach LOS	C		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		39.2			39.2	18.9
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		36.5			36.5	19.5
Max Q Clear Time (g_c+I1), s		19.2			18.6	12.4
Green Ext Time (p_c), s		15.5			15.8	2.1

Intersection Summary	
HCM 6th Ctrl Delay	10.7
HCM 6th LOS	B

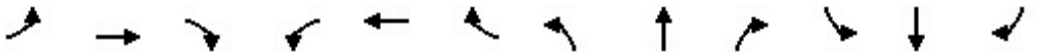
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			146			136			281			55
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



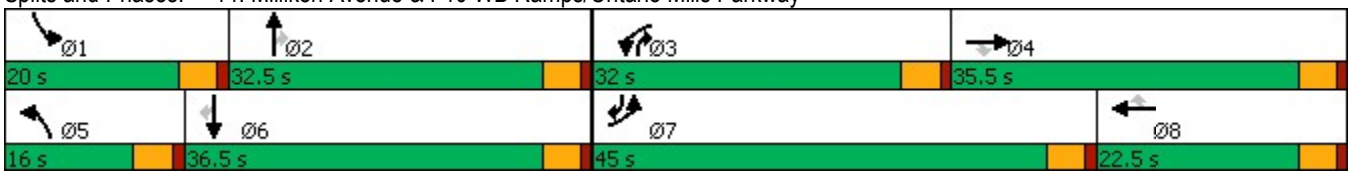
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1010	197	237	253	301	63	240	1040	453	332	1261	479
Future Volume (vph)	1010	197	237	253	301	63	240	1040	453	332	1261	479
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1052	205	247	264	314	66	250	1083	472	346	1314	499
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1052	205	247	264	314	66	250	1083	472	346	1314	499

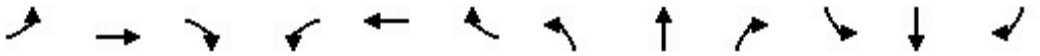
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1010	197	237	253	301	63	240	1040	453	332	1261	479
Future Volume (vph)	1010	197	237	253	301	63	240	1040	453	332	1261	479
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	45.0	35.5	35.5	32.0	22.5	22.5	16.0	32.5	32.0	20.0	36.5	45.0
Total Split (%)	37.5%	29.6%	29.6%	26.7%	18.8%	18.8%	13.3%	27.1%	26.7%	16.7%	30.4%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	40.6	39.5	39.5	16.7	15.6	15.6	11.5	27.2	48.4	15.5	31.2	76.3
Actuated g/C Ratio	0.35	0.34	0.34	0.14	0.13	0.13	0.10	0.23	0.41	0.13	0.27	0.65
v/c Ratio	1.05	0.34	0.41	0.64	0.70	0.21	0.88	0.77	0.60	0.90	0.81	0.50
Control Delay	80.1	32.3	15.1	54.5	57.7	1.5	82.7	46.2	13.1	77.7	44.9	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.1	32.3	15.1	54.5	57.7	1.5	82.7	46.2	13.1	77.7	44.9	11.5
LOS	F	C	B	D	E	A	F	D	B	E	D	B
Approach Delay		62.9			50.6			42.6			42.4	
Approach LOS		E			D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 116.9	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 48.4	Intersection LOS: D
Intersection Capacity Utilization 85.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway



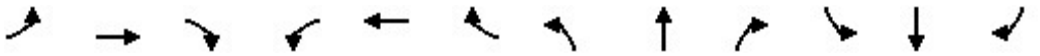


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1052	205	247	264	314	66	250	1083	472	346	1314	499
v/c Ratio	1.05	0.34	0.41	0.64	0.70	0.21	0.88	0.77	0.60	0.90	0.81	0.50
Control Delay	80.1	32.3	15.1	54.5	57.7	1.5	82.7	46.2	13.1	77.7	44.9	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.1	32.3	15.1	54.5	57.7	1.5	82.7	46.2	13.1	77.7	44.9	11.5
Queue Length 50th (ft)	~455	117	55	98	121	0	98	224	104	136	271	159
Queue Length 95th (ft)	#600	197	137	138	171	0	#178	271	199	#229	322	251
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	1002	595	603	681	516	346	284	1456	898	384	1664	998
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.34	0.41	0.39	0.61	0.19	0.88	0.74	0.53	0.90	0.79	0.50

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1010	197	237	253	301	63	240	1040	453	332	1261	479
Future Volume (veh/h)	1010	197	237	253	301	63	240	1040	453	332	1261	479
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	1052	205	247	264	314	66	250	1083	472	346	1314	499
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1020	629	533	328	394	176	290	1477	533	390	1688	942
Arrive On Green	0.35	0.36	0.36	0.11	0.12	0.12	0.10	0.24	0.24	0.13	0.28	0.28
Sat Flow, veh/h	2910	1772	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	1052	205	247	264	314	66	250	1083	472	346	1314	499
Grp Sat Flow(s),veh/h/ln	1455	1772	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	40.5	9.7	14.7	10.2	10.5	4.7	9.8	18.9	28.0	13.5	23.0	21.4
Cycle Q Clear(g_c), s	40.5	9.7	14.7	10.2	10.5	4.7	9.8	18.9	28.0	13.5	23.0	21.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1020	629	533	328	394	176	290	1477	533	390	1688	942
V/C Ratio(X)	1.03	0.33	0.46	0.81	0.80	0.38	0.86	0.73	0.89	0.89	0.78	0.53
Avail Cap(c_a), veh/h	1020	629	533	693	525	234	290	1477	533	390	1688	942
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.5	27.2	28.8	50.0	49.7	47.1	51.2	40.3	35.1	49.1	38.5	12.0
Incr Delay (d2), s/veh	36.5	0.3	0.6	4.7	6.2	1.3	22.5	1.9	16.3	20.9	2.4	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.3	4.2	5.4	3.9	4.7	1.8	4.5	7.3	14.7	6.0	8.8	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.0	27.5	29.4	54.7	55.9	48.4	73.8	42.2	51.3	70.1	40.9	12.6
LnGrp LOS	F	C	C	D	E	D	E	D	D	E	D	B
Approach Vol, veh/h		1504			644			1805			2159	
Approach Delay, s/veh		60.3			54.6			49.0			39.0	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	32.5	17.5	45.5	16.0	36.5	45.0	18.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	28.0	27.5	31.0	11.5	32.0	40.5	18.0
Max Q Clear Time (g_c+I1), s	15.5	30.0	12.2	16.7	11.8	25.0	42.5	12.5
Green Ext Time (p_c), s	0.0	0.0	0.8	1.8	0.0	5.3	0.0	1.0

Intersection Summary	
HCM 6th Ctrl Delay	48.8
HCM 6th LOS	D

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.994	0.850				
Flt Protected	0.954					
Satd. Flow (prot)	3066	1365	0	6071	6071	0
Flt Permitted	0.954					
Satd. Flow (perm)	3066	1365	0	6071	6071	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	5	10				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

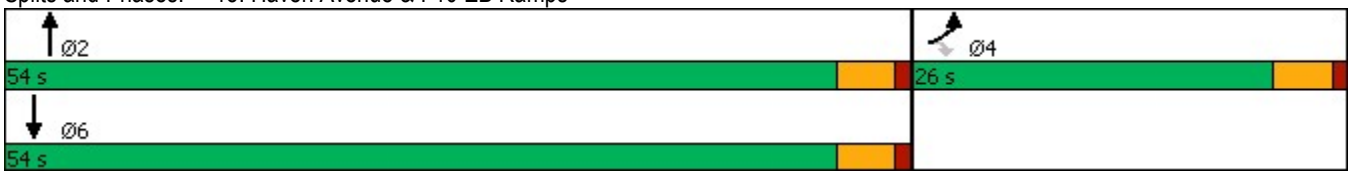
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	649	251	0	2574	2020	0
Future Volume (vph)	649	251	0	2574	2020	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	676	261	0	2681	2104	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	702	235	0	2681	2104	0

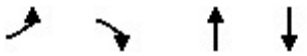
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	649	251	2574	2020
Future Volume (vph)	649	251	2574	2020
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	54.0	54.0
Total Split (%)	32.5%	32.5%	67.5%	67.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	20.6	20.6	49.5	49.5
Actuated g/C Ratio	0.26	0.26	0.62	0.62
v/c Ratio	0.88	0.65	0.71	0.55
Control Delay	41.5	34.2	11.4	9.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	41.5	34.2	11.4	9.3
LOS	D	C	B	A
Approach Delay	39.7		11.4	9.3
Approach LOS	D		B	A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 79.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization 70.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	702	235	2681	2104
v/c Ratio	0.88	0.65	0.71	0.55
Control Delay	41.5	34.2	11.4	9.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	41.5	34.2	11.4	9.3
Queue Length 50th (ft)	169	108	237	159
Queue Length 95th (ft)	#261	192	279	189
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	836	378	3798	3798
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.84	0.62	0.71	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	649	251	0	2574	2020	0
Future Volume (veh/h)	649	251	0	2574	2020	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1772	0	1772	1772	0
Adj Flow Rate, veh/h	676	261	0	2681	2104	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	801	377	0	3823	3823	0
Arrive On Green	0.25	0.25	0.00	0.63	0.63	0.00
Sat Flow, veh/h	3188	1502	0	6592	6592	0
Grp Volume(v), veh/h	676	261	0	2681	2104	0
Grp Sat Flow(s),veh/h/ln	1594	1502	0	1524	1524	0
Q Serve(g_s), s	14.9	11.7	0.0	21.7	14.6	0.0
Cycle Q Clear(g_c), s	14.9	11.7	0.0	21.7	14.6	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	801	377	0	3823	3823	0
V/C Ratio(X)	0.84	0.69	0.00	0.70	0.55	0.00
Avail Cap(c_a), veh/h	925	436	0	4074	4074	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.3	25.1	0.0	9.2	7.9	0.0
Incr Delay (d2), s/veh	6.4	3.9	0.0	0.5	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	4.4	0.0	5.9	3.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	32.8	29.0	0.0	9.7	8.0	0.0
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	937			2681	2104	
Approach Delay, s/veh	31.7			9.7	8.0	
Approach LOS	C			A	A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		51.0		23.1		51.0
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		49.5		21.5		49.5
Max Q Clear Time (g_c+I1), s		23.7		16.9		16.6
Green Ext Time (p_c), s		22.8		1.7		22.4

Intersection Summary		
HCM 6th Ctrl Delay	12.7	
HCM 6th LOS	B	

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1600	1800	1600	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2891	1500	2891	6071	6071	1500
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2891	1500	2891	6071	6071	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		8				83
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	513	202	326	1226	1034	734
Future Volume (vph)	513	202	326	1226	1034	734
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	529	208	336	1264	1066	757
Shared Lane Traffic (%)						
Lane Group Flow (vph)	529	208	336	1264	1066	757

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	513	202	326	1226	1034	734
Future Volume (vph)	513	202	326	1226	1034	734
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	22.5	14.9	14.9	37.5	22.6	22.5
Total Split (%)	37.5%	24.8%	24.8%	62.5%	37.7%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	15.9	30.4	9.9	31.2	16.7	37.2
Actuated g/C Ratio	0.28	0.54	0.18	0.56	0.30	0.66
v/c Ratio	0.65	0.26	0.66	0.38	0.59	0.74
Control Delay	22.2	7.8	29.8	7.6	18.7	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.2	7.8	29.8	7.6	18.7	11.1
LOS	C	A	C	A	B	B
Approach Delay	18.1			12.3	15.5	
Approach LOS	B			B	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 14.7	Intersection LOS: B
Intersection Capacity Utilization 66.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	529	208	336	1264	1066	757
v/c Ratio	0.65	0.26	0.66	0.38	0.59	0.74
Control Delay	22.2	7.8	29.8	7.6	18.7	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.2	7.8	29.8	7.6	18.7	11.1
Queue Length 50th (ft)	83	34	59	67	93	120
Queue Length 95th (ft)	128	66	#100	88	123	245
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	938	831	542	3612	1981	1079
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.25	0.62	0.35	0.54	0.70

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

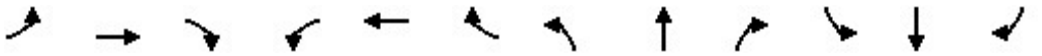
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	513	202	326	1226	1034	734
Future Volume (veh/h)	513	202	326	1226	1034	734
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1772	1575	1772	1772	1772
Adj Flow Rate, veh/h	529	208	336	1264	1066	757
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	700	592	448	3577	2114	882
Arrive On Green	0.24	0.24	0.15	0.59	0.35	0.35
Sat Flow, veh/h	2910	1502	2910	6343	6343	1502
Grp Volume(v), veh/h	529	208	336	1264	1066	757
Grp Sat Flow(s),veh/h/ln	1455	1502	1455	1524	1524	1502
Q Serve(g_s), s	8.8	5.1	5.8	5.6	7.2	18.1
Cycle Q Clear(g_c), s	8.8	5.1	5.8	5.6	7.2	18.1
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	700	592	448	3577	2114	882
V/C Ratio(X)	0.76	0.35	0.75	0.35	0.50	0.86
Avail Cap(c_a), veh/h	1004	749	580	3854	2114	882
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.4	11.1	21.1	5.6	13.5	8.2
Incr Delay (d2), s/veh	2.0	0.4	4.0	0.1	0.2	8.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	4.9	2.0	1.3	2.2	10.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.4	11.5	25.1	5.7	13.7	16.6
LnGrp LOS	C	B	C	A	B	B
Approach Vol, veh/h	737			1600	1823	
Approach Delay, s/veh	17.9			9.8	14.9	
Approach LOS	B			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		35.1		17.1	12.5	22.6
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		33.0		18.0	10.4	18.1
Max Q Clear Time (g_c+I1), s		7.6		10.8	7.8	20.1
Green Ext Time (p_c), s		10.5		1.8	0.3	0.0

Intersection Summary	
HCM 6th Ctrl Delay	13.5
HCM 6th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.955				0.850			0.850		0.992	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4601	0	2891	3353	1500	2891	4818	1500	2891	6022	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4601	0	2891	3353	1500	2891	4818	1500	2891	6022	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		101				248			288		12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



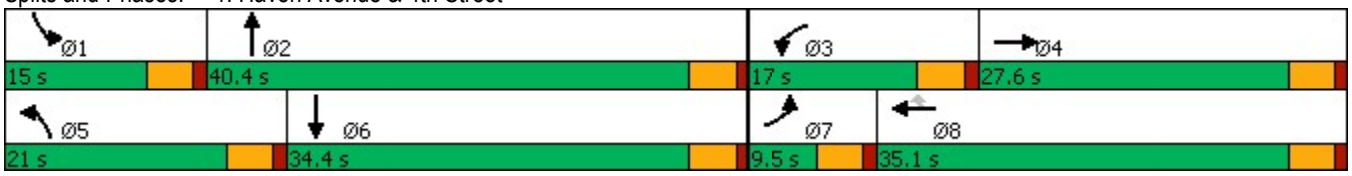
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	52	579	250	371	550	233	306	1424	496	240	1388	79
Future Volume (vph)	52	579	250	371	550	233	306	1424	496	240	1388	79
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	55	616	266	395	585	248	326	1515	528	255	1477	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	882	0	395	585	248	326	1515	528	255	1561	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	52	579	371	550	233	306	1424	496	240	1388
Future Volume (vph)	52	579	371	550	233	306	1424	496	240	1388
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	9.5	27.6	17.0	35.1	35.1	21.0	40.4		15.0	34.4
Total Split (%)	9.5%	27.6%	17.0%	35.1%	35.1%	21.0%	40.4%		15.0%	34.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	5.0	22.1	12.5	31.6	31.6	15.0	35.9	99.0	10.5	31.4
Actuated g/C Ratio	0.05	0.22	0.13	0.32	0.32	0.15	0.36	1.00	0.11	0.32
v/c Ratio	0.38	0.80	1.08	0.55	0.38	0.74	0.87	0.35	0.83	0.81
Control Delay	53.8	38.2	113.5	30.7	5.3	51.2	36.1	0.7	67.3	35.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	38.2	113.5	30.7	5.3	51.2	36.1	0.7	67.3	35.7
LOS	D	D	F	C	A	D	D	A	E	D
Approach Delay		39.1		52.2			30.3			40.1
Approach LOS		D		D			C			D

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 99	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 38.6	Intersection LOS: D
Intersection Capacity Utilization 82.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Haven Avenue & 4th Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	55	882	395	585	248	326	1515	528	255	1561
v/c Ratio	0.38	0.80	1.08	0.55	0.38	0.74	0.87	0.35	0.83	0.81
Control Delay	53.8	38.2	113.5	30.7	5.3	51.2	36.1	0.7	67.3	35.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	38.2	113.5	30.7	5.3	51.2	36.1	0.7	67.3	35.7
Queue Length 50th (ft)	18	172	~147	164	0	102	327	0	83	270
Queue Length 95th (ft)	38	221	#241	221	55	149	391	0	#151	318
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	145	1150	365	1071	648	482	1746	1500	306	1916
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.77	1.08	0.55	0.38	0.68	0.87	0.35	0.83	0.81

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

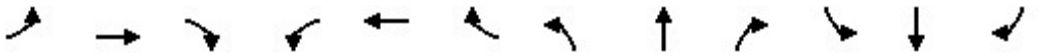
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	579	250	371	550	233	306	1424	496	240	1388	79
Future Volume (veh/h)	52	579	250	371	550	233	306	1424	496	240	1388	79
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	55	616	266	395	585	248	326	1515	0	255	1477	84
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	115	732	309	369	1033	461	390	1764		309	2003	114
Arrive On Green	0.04	0.22	0.22	0.13	0.31	0.31	0.13	0.36	0.00	0.11	0.34	0.34
Sat Flow, veh/h	2910	3335	1409	2910	3367	1502	2910	4837	1502	2910	5945	338
Grp Volume(v), veh/h	55	595	287	395	585	248	326	1515	0	255	1135	426
Grp Sat Flow(s),veh/h/ln	1455	1612	1518	1455	1683	1502	1455	1612	1502	1455	1524	1711
Q Serve(g_s), s	1.8	17.4	17.9	12.5	14.4	13.5	10.8	28.5	0.0	8.5	21.6	21.6
Cycle Q Clear(g_c), s	1.8	17.4	17.9	12.5	14.4	13.5	10.8	28.5	0.0	8.5	21.6	21.6
Prop In Lane	1.00		0.93	1.00		1.00	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	115	708	333	369	1033	461	390	1764		309	1540	576
V/C Ratio(X)	0.48	0.84	0.86	1.07	0.57	0.54	0.84	0.86		0.83	0.74	0.74
Avail Cap(c_a), veh/h	148	757	356	369	1046	467	488	1764		310	1540	576
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.3	36.8	37.0	43.0	28.6	28.3	41.6	28.9	0.0	43.1	28.8	28.8
Incr Delay (d2), s/veh	3.1	8.0	17.9	66.4	0.7	1.2	10.0	5.7	0.0	16.5	3.2	8.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	7.5	8.2	7.8	5.8	4.9	4.4	11.6	0.0	3.7	8.1	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.4	44.8	54.9	109.4	29.3	29.5	51.6	34.6	0.0	59.6	32.0	37.1
LnGrp LOS	D	D	D	F	C	C	D	C		E	C	D
Approach Vol, veh/h		937			1228			1841	A		1816	
Approach Delay, s/veh		48.2			55.1			37.6			37.1	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.9	40.4	17.0	26.1	17.7	37.7	8.4	34.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	35.9	12.5	23.1	16.5	29.9	5.0	30.6
Max Q Clear Time (g_c+I1), s	10.5	30.5	14.5	19.9	12.8	23.6	3.8	16.4
Green Ext Time (p_c), s	0.0	4.1	0.0	1.7	0.4	4.6	0.0	4.2

Intersection Summary	
HCM 6th Ctrl Delay	42.8
HCM 6th LOS	D

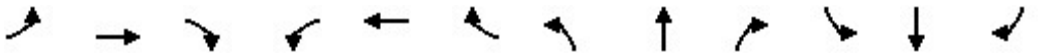
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.993				0.850			0.850		0.850	
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1667	6028	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1667	6028	0	1583	4818	1500	1583	1765	1500	1583	2850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13				182			201		266	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



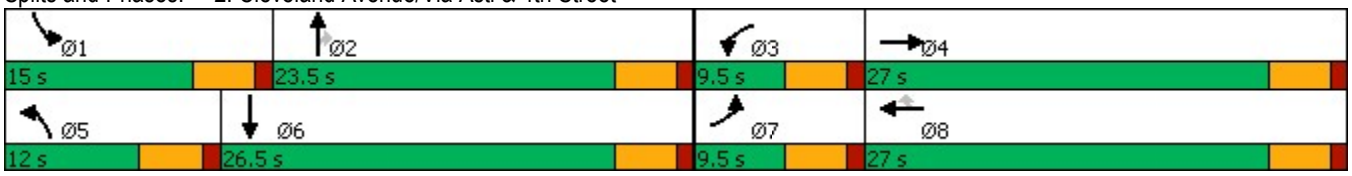
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	1337	64	3	1108	177	59	0	4	174	0	1
Future Volume (vph)	0	1337	64	3	1108	177	59	0	4	174	0	1
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1378	66	3	1142	182	61	0	4	179	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1444	0	3	1142	182	61	0	4	179	1	0

Intersection Summary

Lane Group	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT	Ø7
Lane Configurations									
Traffic Volume (vph)	1337	3	1108	177	59	4	174	0	
Future Volume (vph)	1337	3	1108	177	59	4	174	0	
Turn Type	NA	Prot	NA	Perm	Prot	Perm	Prot	NA	
Protected Phases	4	3	8		5		1	6	7
Permitted Phases				8		2			
Detector Phase	4	3	8	8	5	2	1	6	
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5	9.5
Total Split (s)	27.0	9.5	27.0	27.0	12.0	23.5	15.0	26.5	9.5
Total Split (%)	36.0%	12.7%	36.0%	36.0%	16.0%	31.3%	20.0%	35.3%	13%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min	None
Act Effct Green (s)	21.7	5.0	23.3	23.3	6.9	5.5	10.2	13.4	
Actuated g/C Ratio	0.41	0.10	0.44	0.44	0.13	0.10	0.19	0.25	
v/c Ratio	0.58	0.02	0.54	0.24	0.30	0.01	0.59	0.00	
Control Delay	13.4	24.3	11.6	2.5	26.3	0.0	30.7	0.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	13.4	24.3	11.6	2.5	26.3	0.0	30.7	0.0	
LOS	B	C	B	A	C	A	C	A	
Approach Delay	13.4		10.4					30.5	
Approach LOS	B		B					C	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 52.6	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 47.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street



Lane Group	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	1444	3	1142	182	61	4	179	1
v/c Ratio	0.58	0.02	0.54	0.24	0.30	0.01	0.59	0.00
Control Delay	13.4	24.3	11.6	2.5	26.3	0.0	30.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	24.3	11.6	2.5	26.3	0.0	30.7	0.0
Queue Length 50th (ft)	89	1	89	0	17	0	50	0
Queue Length 95th (ft)	160	8	119	24	52	0	#141	0
Internal Link Dist (ft)	2546		362					358
Turn Bay Length (ft)		130		145	165	165	50	
Base Capacity (vph)	2607	151	2226	791	227	674	318	1355
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.02	0.51	0.23	0.27	0.01	0.56	0.00

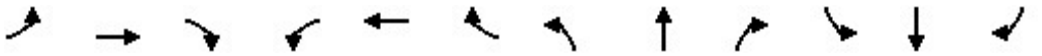
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1337	64	3	1108	177	59	0	4	174	0	1
Future Volume (veh/h)	0	1337	64	3	1108	177	59	0	4	174	0	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	0	1378	66	3	1142	182	61	0	4	179	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	3	2263	108	7	2297	713	92	185	157	222	313	279
Arrive On Green	0.00	0.38	0.38	0.00	0.47	0.47	0.06	0.00	0.10	0.14	0.00	0.19
Sat Flow, veh/h	1594	6005	287	1594	4837	1502	1594	1772	1502	1594	1683	1502
Grp Volume(v), veh/h	0	1049	395	3	1142	182	61	0	4	179	0	1
Grp Sat Flow(s),veh/h/ln	1594	1524	1720	1594	1612	1502	1594	1772	1502	1594	1683	1502
Q Serve(g_s), s	0.0	8.9	8.9	0.1	7.8	3.5	1.8	0.0	0.1	5.2	0.0	0.0
Cycle Q Clear(g_c), s	0.0	8.9	8.9	0.1	7.8	3.5	1.8	0.0	0.1	5.2	0.0	0.0
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	3	1723	648	7	2297	713	92	185	157	222	313	279
V/C Ratio(X)	0.00	0.61	0.61	0.46	0.50	0.26	0.66	0.00	0.03	0.81	0.00	0.00
Avail Cap(c_a), veh/h	166	2145	807	166	2297	713	249	702	595	349	772	689
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.1	12.1	23.8	8.7	7.5	22.1	0.0	19.3	20.0	0.0	15.9
Incr Delay (d2), s/veh	0.0	0.4	0.9	43.3	0.2	0.2	7.8	0.0	0.1	7.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.5	2.9	0.1	2.1	0.9	0.8	0.0	0.0	2.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	12.4	13.0	67.2	8.8	7.7	29.9	0.0	19.4	27.3	0.0	15.9
LnGrp LOS	A	B	B	E	A	A	C	A	B	C	A	B
Approach Vol, veh/h		1444			1327			65			180	
Approach Delay, s/veh		12.6			8.8			29.2			27.3	
Approach LOS		B			A			C			C	

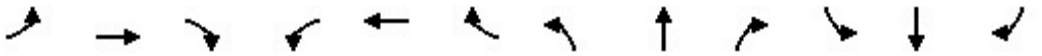
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.2	9.5	4.7	22.6	7.3	13.4	0.0	27.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	19.0	5.0	22.5	7.5	22.0	5.0	22.5
Max Q Clear Time (g_c+I1), s	7.2	2.1	2.1	10.9	3.8	2.0	0.0	9.8
Green Ext Time (p_c), s	0.1	0.0	0.0	7.2	0.0	0.0	0.0	6.9

Intersection Summary	
HCM 6th Ctrl Delay	12.2
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.994				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.953	
Satd. Flow (prot)	2891	6065	0	1583	4789	0	1583	1765	1500	0	1682	1500
Flt Permitted	0.950			0.950			0.725				0.731	
Satd. Flow (perm)	2891	6065	0	1583	4789	0	1208	1765	1500	0	1290	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			11				219			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



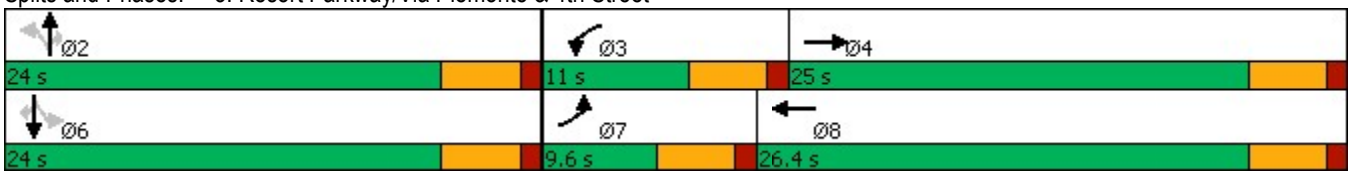
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	11	1488	8	65	1223	47	32	0	37	47	1	16
Future Volume (vph)	11	1488	8	65	1223	47	32	0	37	47	1	16
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	1534	8	67	1261	48	33	0	38	48	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	1542	0	67	1309	0	33	0	38	0	49	16

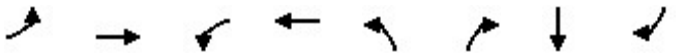
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	11	1488	65	1223	32	37	47	1	16
Future Volume (vph)	11	1488	65	1223	32	37	47	1	16
Turn Type	Prot	NA	Prot	NA	Perm	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8				6	
Permitted Phases					2	2	6		6
Detector Phase	7	4	3	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.6	25.0	11.0	26.4	24.0	24.0	24.0	24.0	24.0
Total Split (%)	16.0%	41.7%	18.3%	44.0%	40.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min
Act Effct Green (s)	5.3	19.9	6.4	24.0	7.2	7.2		7.2	7.2
Actuated g/C Ratio	0.13	0.47	0.15	0.57	0.17	0.17		0.17	0.17
v/c Ratio	0.03	0.54	0.28	0.48	0.16	0.09		0.22	0.05
Control Delay	20.1	9.9	22.2	6.7	19.3	0.4		20.1	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	20.1	9.9	22.2	6.7	19.3	0.4		20.1	0.2
LOS	C	A	C	A	B	A		C	A
Approach Delay		10.0		7.5				15.2	
Approach LOS		A		A				B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 42.2	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 50.9%	ICU Level of Service A
Analysis Period (min) 15	

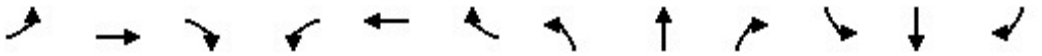
Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street





Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBT	SBR
Lane Group Flow (vph)	11	1542	67	1309	33	38	49	16
v/c Ratio	0.03	0.54	0.28	0.48	0.16	0.09	0.22	0.05
Control Delay	20.1	9.9	22.2	6.7	19.3	0.4	20.1	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	9.9	22.2	6.7	19.3	0.4	20.1	0.2
Queue Length 50th (ft)	1	87	17	45	8	0	12	0
Queue Length 95th (ft)	7	128	47	137	27	0	35	0
Internal Link Dist (ft)		362		428			378	
Turn Bay Length (ft)	220		125		115	115		110
Base Capacity (vph)	363	3068	253	2975	581	835	620	778
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.50	0.26	0.44	0.06	0.05	0.08	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1488	8	65	1223	47	32	0	37	47	1	16
Future Volume (veh/h)	11	1488	8	65	1223	47	32	0	37	47	1	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	11	1534	8	67	1261	48	33	0	38	48	1	16
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	42	2761	14	107	2346	89	327	237	201	370	6	201
Arrive On Green	0.01	0.44	0.44	0.07	0.49	0.49	0.13	0.00	0.13	0.13	0.13	0.13
Sat Flow, veh/h	2910	6305	33	1594	4782	182	1318	1772	1502	1337	43	1502
Grp Volume(v), veh/h	11	1112	430	67	850	459	33	0	38	49	0	16
Grp Sat Flow(s),veh/h/ln	1455	1524	1766	1594	1612	1739	1318	1772	1502	1379	0	1502
Q Serve(g_s), s	0.1	6.8	6.8	1.5	6.8	6.8	0.9	0.0	0.8	1.1	0.0	0.3
Cycle Q Clear(g_c), s	0.1	6.8	6.8	1.5	6.8	6.8	2.0	0.0	0.8	1.2	0.0	0.3
Prop In Lane	1.00		0.02	1.00		0.10	1.00		1.00	0.98		1.00
Lane Grp Cap(c), veh/h	42	2002	773	107	1582	853	327	237	201	375	0	201
V/C Ratio(X)	0.26	0.56	0.56	0.63	0.54	0.54	0.10	0.00	0.19	0.13	0.00	0.08
Avail Cap(c_a), veh/h	397	2508	969	277	1890	1019	839	925	784	909	0	784
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.2	7.8	7.8	17.0	6.6	6.6	15.4	0.0	14.4	14.5	0.0	14.2
Incr Delay (d2), s/veh	3.3	0.2	0.6	5.9	0.3	0.5	0.1	0.0	0.5	0.2	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.5	1.8	0.6	1.5	1.6	0.2	0.0	0.3	0.3	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.5	8.0	8.4	22.9	6.9	7.1	15.6	0.0	14.8	14.7	0.0	14.3
LnGrp LOS	C	A	A	C	A	A	B	A	B	B	A	B
Approach Vol, veh/h		1553			1376			71			65	
Approach Delay, s/veh		8.2			7.7			15.2			14.6	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	7.0	20.9		9.5	5.0	22.8				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		19.5	6.5	20.5		19.5	5.1	21.9				
Max Q Clear Time (g_c+I1), s		4.0	3.5	8.8		3.2	2.1	8.8				
Green Ext Time (p_c), s		0.1	0.0	7.6		0.2	0.0	7.1				

Intersection Summary	
HCM 6th Ctrl Delay	8.3
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.993					0.865
Flt Protected						
Satd. Flow (prot)	4784	0	0	4818	0	1526
Flt Permitted						
Satd. Flow (perm)	4784	0	0	4818	0	1526
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	1498	75	0	1356	0	45
Future Volume (vph)	1498	75	0	1356	0	45
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1577	79	0	1427	0	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1656	0	0	1427	0	47

Intersection Summary

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1498	75	0	1356	0	45
Future Vol, veh/h	1498	75	0	1356	0	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1577	79	0	1427	0	47

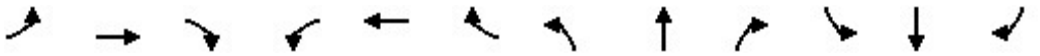
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	828
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	270
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	270
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	21.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	270	-	-	-
HCM Lane V/C Ratio	0.175	-	-	-
HCM Control Delay (s)	21.1	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.6	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.979	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5943	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	2891	6071	1500	2891	5943	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			252			323			95		32	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



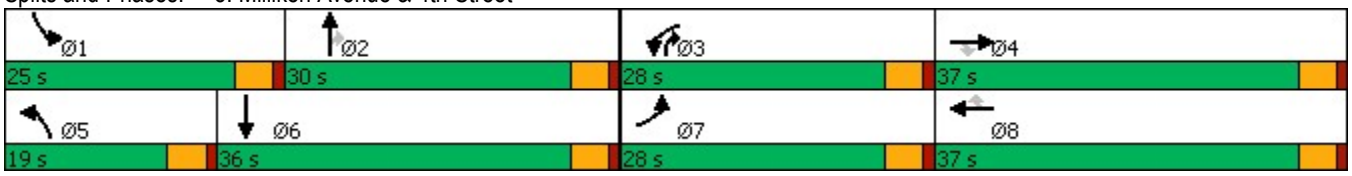
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	280	1213	403	550	959	327	328	1022	386	439	993	158
Future Volume (vph)	280	1213	403	550	959	327	328	1022	386	439	993	158
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	295	1277	424	579	1009	344	345	1076	406	462	1045	166
Shared Lane Traffic (%)												
Lane Group Flow (vph)	295	1277	424	579	1009	344	345	1076	406	462	1211	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	280	1213	403	550	959	327	328	1022	386	439	993
Future Volume (vph)	280	1213	403	550	959	327	328	1022	386	439	993
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	28.0	37.0	37.0	28.0	37.0	37.0	19.0	30.0	28.0	25.0	36.0
Total Split (%)	23.3%	30.8%	30.8%	23.3%	30.8%	30.8%	15.8%	25.0%	23.3%	20.8%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	17.4	32.5	32.5	23.5	38.5	38.5	14.5	25.2	53.2	20.5	31.2
Actuated g/C Ratio	0.15	0.27	0.27	0.20	0.32	0.32	0.12	0.21	0.44	0.17	0.26
v/c Ratio	0.70	0.98	0.72	1.02	0.65	0.49	0.99	0.84	0.56	0.94	0.77
Control Delay	57.6	63.4	23.3	90.8	37.9	7.2	97.6	52.3	22.0	76.6	43.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.6	63.4	23.3	90.8	37.9	7.2	97.6	52.3	22.0	76.6	43.7
LOS	E	E	C	F	D	A	F	D	C	E	D
Approach Delay		54.0			48.3			54.1			52.8
Approach LOS		D			D			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.7	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 52.3	Intersection LOS: D
Intersection Capacity Utilization 88.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 5: Milliken Avenue & 4th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	295	1277	424	579	1009	344	345	1076	406	462	1211
v/c Ratio	0.70	0.98	0.72	1.02	0.65	0.49	0.99	0.84	0.56	0.94	0.77
Control Delay	57.6	63.4	23.3	90.8	37.9	7.2	97.6	52.3	22.0	76.6	43.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.6	63.4	23.3	90.8	37.9	7.2	97.6	52.3	22.0	76.6	43.7
Queue Length 50th (ft)	113	360	121	~245	245	11	139	233	174	184	246
Queue Length 95th (ft)	154	#464	249	#359	314	91	#238	277	276	#285	289
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	567	1307	591	567	1551	702	350	1293	719	494	1587
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.98	0.72	1.02	0.65	0.49	0.99	0.83	0.56	0.94	0.76

Intersection Summary

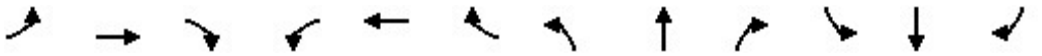
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	1213	403	550	959	327	328	1022	386	439	993	158
Future Volume (veh/h)	280	1213	403	550	959	327	328	1022	386	439	993	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	295	1277	424	579	1009	344	345	1076	406	462	1045	166
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	354	1310	407	570	1669	518	352	1295	613	497	1405	221
Arrive On Green	0.12	0.27	0.27	0.20	0.34	0.34	0.12	0.21	0.21	0.17	0.26	0.26
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	2910	6095	1502	2910	5351	841
Grp Volume(v), veh/h	295	1277	424	579	1009	344	345	1076	406	462	891	320
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1455	1524	1502	1455	1524	1621
Q Serve(g_s), s	11.9	31.4	32.5	23.5	20.7	23.4	14.2	20.3	25.5	18.8	21.4	21.8
Cycle Q Clear(g_c), s	11.9	31.4	32.5	23.5	20.7	23.4	14.2	20.3	25.5	18.8	21.4	21.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.52
Lane Grp Cap(c), veh/h	354	1310	407	570	1669	518	352	1295	613	497	1200	425
V/C Ratio(X)	0.83	0.97	1.04	1.02	0.60	0.66	0.98	0.83	0.66	0.93	0.74	0.75
Avail Cap(c_a), veh/h	570	1310	407	570	1669	518	352	1295	613	497	1200	425
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.5	43.3	43.8	48.3	32.5	33.4	52.6	45.2	28.8	49.0	40.5	40.7
Incr Delay (d2), s/veh	5.7	19.0	56.1	41.8	0.6	3.2	42.8	4.7	2.7	24.1	2.5	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	14.7	18.3	11.8	8.2	8.9	7.3	8.1	9.8	8.5	8.3	9.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.2	62.4	99.9	90.0	33.2	36.6	95.4	49.9	31.4	73.1	43.1	48.0
LnGrp LOS	E	E	F	F	C	D	F	D	C	E	D	D
Approach Vol, veh/h		1996			1932			1827			1673	
Approach Delay, s/veh		69.6			50.8			54.4			52.3	
Approach LOS		E			D			D			D	

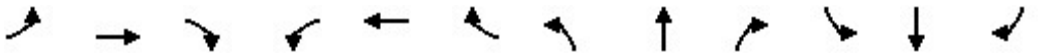
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.0	30.0	28.0	37.0	19.0	36.0	19.1	45.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	20.5	25.5	23.5	32.5	14.5	31.5	23.5	32.5
Max Q Clear Time (g_c+I1), s	20.8	27.5	25.5	34.5	16.2	23.8	13.9	25.4
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	4.6	0.7	4.4

Intersection Summary	
HCM 6th Ctrl Delay	57.1
HCM 6th LOS	E



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.940	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	3019	1365
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	4818	1500	2891	4818	1500	1583	3353	1500	1583	3019	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			141			280			355		125	400
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



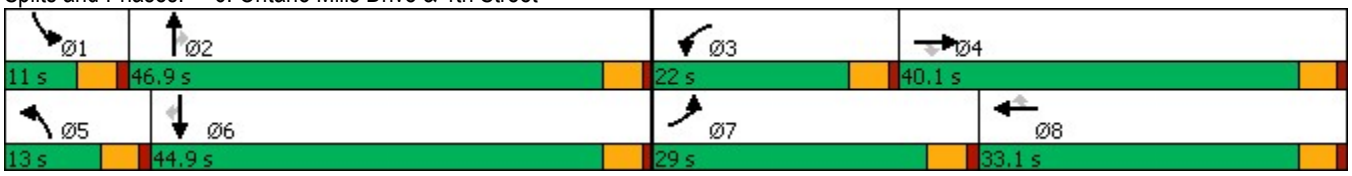
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	779	1366	156	431	1099	529	182	318	496	110	632	906
Future Volume (vph)	779	1366	156	431	1099	529	182	318	496	110	632	906
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	811	1423	163	449	1145	551	190	331	517	115	658	944
Shared Lane Traffic (%)												47%
Lane Group Flow (vph)	811	1423	163	449	1145	551	190	331	517	115	1102	500

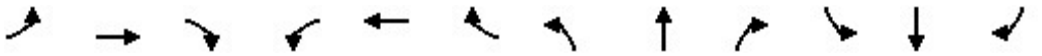
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	779	1366	156	431	1099	529	182	318	496	110	632	906
Future Volume (vph)	779	1366	156	431	1099	529	182	318	496	110	632	906
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	29.0	40.1	40.1	22.0	33.1	33.1	13.0	46.9	46.9	11.0	44.9	44.9
Total Split (%)	24.2%	33.4%	33.4%	18.3%	27.6%	27.6%	10.8%	39.1%	39.1%	9.2%	37.4%	37.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	24.5	35.6	35.6	17.5	28.6	28.6	8.5	42.4	42.4	6.5	40.4	40.4
Actuated g/C Ratio	0.20	0.30	0.30	0.15	0.24	0.24	0.07	0.35	0.35	0.05	0.34	0.34
v/c Ratio	1.37	1.00	0.30	1.07	1.00	0.97	1.70	0.28	0.68	1.35	1.00	0.69
Control Delay	216.2	65.1	8.9	111.4	71.8	53.1	382.5	28.7	14.9	260.6	63.3	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	216.2	65.1	8.9	111.4	71.8	53.1	382.5	28.7	14.9	260.6	63.3	12.7
LOS	F	E	A	F	E	D	F	C	B	F	E	B
Approach Delay		112.4			75.3			86.6			61.8	
Approach LOS		F			E			F			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.70	
Intersection Signal Delay: 85.9	Intersection LOS: F
Intersection Capacity Utilization 103.7%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 6: Ontario Mills Drive & 4th Street



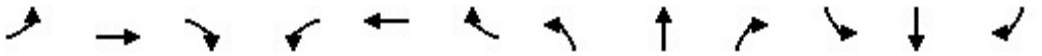


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	811	1423	163	449	1145	551	190	331	517	115	1102	500
v/c Ratio	1.37	1.00	0.30	1.07	1.00	0.97	1.70	0.28	0.68	1.35	1.00	0.69
Control Delay	216.2	65.1	8.9	111.4	71.8	53.1	382.5	28.7	14.9	260.6	63.3	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	216.2	65.1	8.9	111.4	71.8	53.1	382.5	28.7	14.9	260.6	63.3	12.7
Queue Length 50th (ft)	~428	402	12	~197	326	236	~216	96	100	~116	~429	60
Queue Length 95th (ft)	#553	#515	64	#303	#431	#471	#366	134	233	#239	#594	207
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	590	1429	544	421	1148	570	112	1184	759	85	1099	724
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.37	1.00	0.30	1.07	1.00	0.97	1.70	0.28	0.68	1.35	1.00	0.69

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



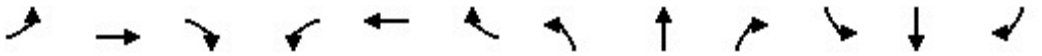
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	779	1366	156	431	1099	529	182	318	496	110	632	906
Future Volume (veh/h)	779	1366	156	431	1099	529	182	318	496	110	632	906
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	811	1423	162	449	1145	551	190	331	517	115	658	944
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	594	1435	445	424	1153	358	113	1190	531	86	597	1011
Arrive On Green	0.20	0.30	0.30	0.15	0.24	0.24	0.07	0.35	0.35	0.05	0.34	0.34
Sat Flow, veh/h	2910	4837	1502	2910	4837	1502	1594	3367	1502	1594	1772	3003
Grp Volume(v), veh/h	811	1423	162	449	1145	551	190	331	517	115	658	944
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1455	1612	1502	1594	1683	1502	1594	1772	1502
Q Serve(g_s), s	24.5	35.2	10.2	17.5	28.3	28.6	8.5	8.5	40.7	6.5	40.4	36.5
Cycle Q Clear(g_c), s	24.5	35.2	10.2	17.5	28.3	28.6	8.5	8.5	40.7	6.5	40.4	36.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	594	1435	445	424	1153	358	113	1190	531	86	597	1011
V/C Ratio(X)	1.36	0.99	0.36	1.06	0.99	1.54	1.68	0.28	0.97	1.33	1.10	0.93
Avail Cap(c_a), veh/h	594	1435	445	424	1153	358	113	1190	531	86	597	1011
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.8	42.1	33.3	51.3	45.6	45.7	55.8	27.8	38.3	56.8	39.8	38.5
Incr Delay (d2), s/veh	174.9	21.7	0.5	59.8	24.8	256.4	342.6	0.1	32.5	209.2	68.3	15.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	23.3	16.7	3.8	9.9	13.9	36.1	14.2	3.4	19.5	7.6	28.6	15.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	222.6	63.7	33.8	111.1	70.4	302.1	398.3	28.0	70.7	265.9	108.1	53.5
LnGrp LOS	F	E	C	F	E	F	F	C	E	F	F	D
Approach Vol, veh/h		2396			2145			1038			1717	
Approach Delay, s/veh		115.5			138.4			117.1			88.6	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	46.9	22.0	40.1	13.0	44.9	29.0	33.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	42.4	17.5	35.6	8.5	40.4	24.5	28.6
Max Q Clear Time (g_c+I1), s	8.5	42.7	19.5	37.2	10.5	42.4	26.5	30.6
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	116.1
HCM 6th LOS	F

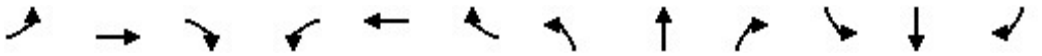
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.982			0.943				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.982	
Satd. Flow (prot)	2891	4818	1500	1583	4731	0	1583	3162	0	1504	1646	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.982	
Satd. Flow (perm)	2891	4818	1500	1583	4731	0	1583	3162	0	1504	1646	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132		18			50				317
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



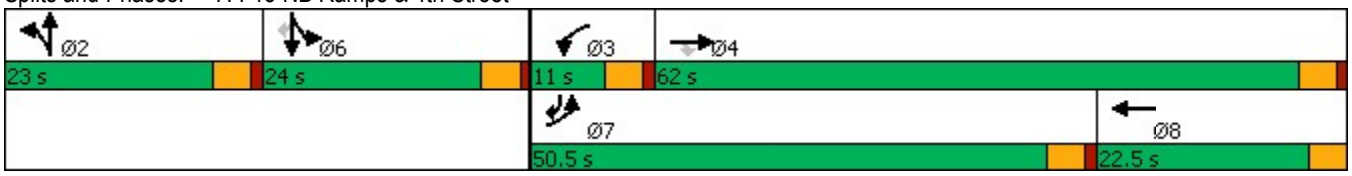
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1145	671	124	32	769	107	126	76	47	175	84	1183
Future Volume (vph)	1145	671	124	32	769	107	126	76	47	175	84	1183
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1218	714	132	34	818	114	134	81	50	186	89	1259
Shared Lane Traffic (%)										27%		
Lane Group Flow (vph)	1218	714	132	34	932	0	134	131	0	136	139	1259

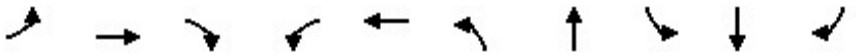
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	1145	671	124	32	769	126	76	175	84	1183
Future Volume (vph)	1145	671	124	32	769	126	76	175	84	1183
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	50.5	62.0	62.0	11.0	22.5	23.0	23.0	24.0	24.0	50.5
Total Split (%)	42.1%	51.7%	51.7%	9.2%	18.8%	19.2%	19.2%	20.0%	20.0%	42.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	46.2	62.5	62.5	6.3	19.1	14.1	14.1	14.8	14.8	65.5
Actuated g/C Ratio	0.42	0.56	0.56	0.06	0.17	0.13	0.13	0.13	0.13	0.59
v/c Ratio	1.01	0.26	0.15	0.38	1.13	0.67	0.29	0.68	0.64	0.75
Control Delay	63.3	14.8	3.3	65.8	114.6	63.6	29.3	64.3	59.9	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.3	14.8	3.3	65.8	114.6	63.6	29.3	64.3	59.9	15.7
LOS	E	B	A	E	F	E	C	E	E	B
Approach Delay		42.7			112.9		46.6		24.0	
Approach LOS		D			F		D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 111.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 51.0	Intersection LOS: D
Intersection Capacity Utilization 86.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street



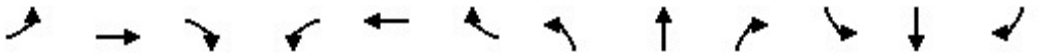


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1218	714	132	34	932	134	131	136	139	1259
v/c Ratio	1.01	0.26	0.15	0.38	1.13	0.67	0.29	0.68	0.64	0.75
Control Delay	63.3	14.8	3.3	65.8	114.6	63.6	29.3	64.3	59.9	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.3	14.8	3.3	65.8	114.6	63.6	29.3	64.3	59.9	15.7
Queue Length 50th (ft)	~484	103	0	24	~284	93	27	98	101	271
Queue Length 95th (ft)	#685	150	33	61	#414	164	59	174	176	398
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	1200	2706	900	92	826	264	569	264	289	1684
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.26	0.15	0.37	1.13	0.51	0.23	0.52	0.48	0.75

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1145	671	124	32	769	107	126	76	47	175	84	1183
Future Volume (veh/h)	1145	671	124	32	769	107	126	76	47	175	84	1183
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1673	1772	1772	1673	1772	1772	1673	1772	1772
Adj Flow Rate, veh/h	1218	714	132	34	818	114	134	81	50	138	157	1259
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1169	2606	809	46	713	99	167	217	124	271	302	1718
Arrive On Green	0.40	0.54	0.54	0.03	0.17	0.17	0.10	0.10	0.10	0.17	0.17	0.17
Sat Flow, veh/h	2910	4837	1502	1594	4295	595	1594	2063	1180	1594	1772	3003
Grp Volume(v), veh/h	1218	714	132	34	613	319	134	65	66	138	157	1259
Grp Sat Flow(s),veh/h/ln	1455	1612	1502	1594	1612	1665	1594	1683	1560	1594	1772	1502
Q Serve(g_s), s	46.0	9.1	5.1	2.4	19.0	19.0	9.4	4.1	4.5	9.0	9.2	19.5
Cycle Q Clear(g_c), s	46.0	9.1	5.1	2.4	19.0	19.0	9.4	4.1	4.5	9.0	9.2	19.5
Prop In Lane	1.00		1.00	1.00		0.36	1.00		0.76	1.00		1.00
Lane Grp Cap(c), veh/h	1169	2606	809	46	535	276	167	177	164	271	302	1718
V/C Ratio(X)	1.04	0.27	0.16	0.74	1.15	1.15	0.80	0.37	0.40	0.51	0.52	0.73
Avail Cap(c_a), veh/h	1169	2606	809	90	535	276	257	272	252	271	302	1718
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.3	14.3	13.4	55.2	47.8	47.8	50.1	47.7	47.9	43.2	43.3	18.1
Incr Delay (d2), s/veh	37.9	0.1	0.1	20.4	85.8	102.7	9.7	1.3	1.6	1.6	1.6	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.9	3.3	1.7	1.2	14.0	15.7	4.2	1.8	1.8	3.7	4.2	12.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.2	14.4	13.5	75.6	133.6	150.4	59.8	49.0	49.5	44.7	44.8	19.7
LnGrp LOS	F	B	B	E	F	F	E	D	D	D	D	B
Approach Vol, veh/h		2064			966			265			1554	
Approach Delay, s/veh		48.4			137.1			54.6			24.5	
Approach LOS		D			F			D			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		16.5	7.8	66.2		24.0	50.5	23.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		18.5	6.5	57.5		19.5	46.0	* 19				
Max Q Clear Time (g_c+I1), s		11.4	4.4	11.1		21.5	48.0	21.0				
Green Ext Time (p_c), s		0.6	0.0	6.4		0.0	0.0	0.0				

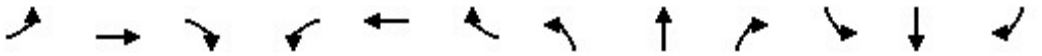
Intersection Summary		
HCM 6th Ctrl Delay		58.8
HCM 6th LOS		E

Notes

User approved volume balancing among the lanes for turning movement.

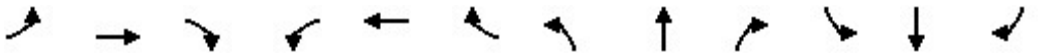
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

User approved changes to right turn type.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.903				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3028	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3028	0	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		50				236			279			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



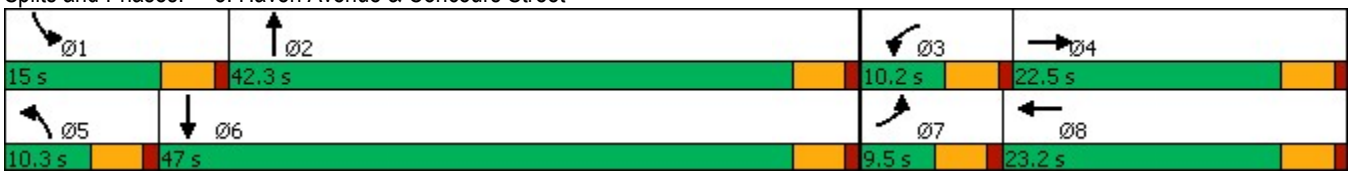
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	12	25	47	195	54	60	45	1886	299	274	1800	31
Future Volume (vph)	12	25	47	195	54	60	45	1886	299	274	1800	31
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	13	27	50	207	57	64	48	2006	318	291	1915	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	77	0	207	57	64	48	2006	318	291	1915	33

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	12	25	195	54	60	45	1886	299	274	1800	31
Future Volume (vph)	12	25	195	54	60	45	1886	299	274	1800	31
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	10.2	23.2		10.3	42.3		15.0	47.0	
Total Split (%)	10.6%	25.0%	11.3%	25.8%		11.4%	47.0%		16.7%	52.2%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.0	6.4	5.8	12.5	75.2	5.8	36.9	75.2	10.5	46.0	75.2
Actuated g/C Ratio	0.07	0.09	0.08	0.17	1.00	0.08	0.49	1.00	0.14	0.61	1.00
v/c Ratio	0.07	0.25	0.69	0.10	0.04	0.22	0.67	0.21	0.73	0.52	0.02
Control Delay	35.9	18.4	48.7	28.6	0.1	37.1	16.5	0.3	44.4	10.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.9	18.4	48.7	28.6	0.1	37.1	16.5	0.3	44.4	10.4	0.0
LOS	D	B	D	C	A	D	B	A	D	B	A
Approach Delay		20.9		35.7			14.8			14.7	
Approach LOS		C		D			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 75.2	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 16.2	Intersection LOS: B
Intersection Capacity Utilization 60.7%	ICU Level of Service B
Analysis Period (min) 15	

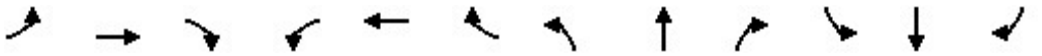
Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	13	77	207	57	64	48	2006	318	291	1915	33
v/c Ratio	0.07	0.25	0.69	0.10	0.04	0.22	0.67	0.21	0.73	0.52	0.02
Control Delay	35.9	18.4	48.7	28.6	0.1	37.1	16.5	0.3	44.4	10.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.9	18.4	48.7	28.6	0.1	37.1	16.5	0.3	44.4	10.4	0.0
Queue Length 50th (ft)	3	6	35	11	0	11	207	0	71	167	0
Queue Length 95th (ft)	11	26	#70	31	0	28	261	0	#131	212	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	194	769	301	841	1500	225	3081	1500	407	3711	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.10	0.69	0.07	0.04	0.21	0.65	0.21	0.71	0.52	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



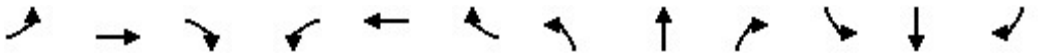
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	25	47	195	54	60	45	1886	299	274	1800	31
Future Volume (veh/h)	12	25	47	195	54	60	45	1886	299	274	1800	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	13	27	50	207	57	0	48	2006	0	291	1915	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	46	112	100	308	432		125	2892		370	3405	
Arrive On Green	0.02	0.07	0.07	0.08	0.13	0.00	0.04	0.47	0.00	0.13	0.56	0.00
Sat Flow, veh/h	2910	1683	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	13	27	50	207	57	0	48	2006	0	291	1915	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	0.3	1.1	2.3	3.6	1.1	0.0	1.1	18.3	0.0	6.9	14.3	0.0
Cycle Q Clear(g_c), s	0.3	1.1	2.3	3.6	1.1	0.0	1.1	18.3	0.0	6.9	14.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	46	112	100	308	432		125	2892		370	3405	
V/C Ratio(X)	0.28	0.24	0.50	0.67	0.13		0.38	0.69		0.79	0.56	
Avail Cap(c_a), veh/h	205	427	381	319	888		238	3250		431	3654	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.5	31.4	31.9	31.8	27.4	0.0	33.0	14.6	0.0	30.0	10.1	0.0
Incr Delay (d2), s/veh	3.2	1.1	3.8	5.2	0.1	0.0	1.9	0.6	0.0	8.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.5	0.9	1.3	0.4	0.0	0.4	5.7	0.0	2.7	4.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.7	32.5	35.8	37.0	27.5	0.0	34.9	15.2	0.0	38.1	10.2	0.0
LnGrp LOS	D	C	D	D	C		C	B		D	B	
Approach Vol, veh/h		90			264	A		2054	A		2206	A
Approach Delay, s/veh		35.1			34.9			15.6			13.9	
Approach LOS		D			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.5	38.1	10.0	9.2	7.6	44.1	5.6	13.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	37.8	5.7	18.0	5.8	42.5	5.0	18.7
Max Q Clear Time (g_c+I1), s	8.9	20.3	5.6	4.3	3.1	16.3	2.3	3.1
Green Ext Time (p_c), s	0.2	13.4	0.0	0.3	0.0	17.3	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	16.3
HCM 6th LOS	B

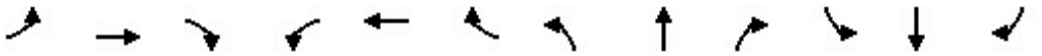
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.995									0.936	
Flt Protected	0.950	0.954					0.950					
Satd. Flow (prot)	1593	1591	0	0	1765	0	1676	4818	0	1765	4509	0
Flt Permitted	0.950	0.954					0.950					
Satd. Flow (perm)	1593	1591	0	0	1765	0	1676	4818	0	1765	4509	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		143									187	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



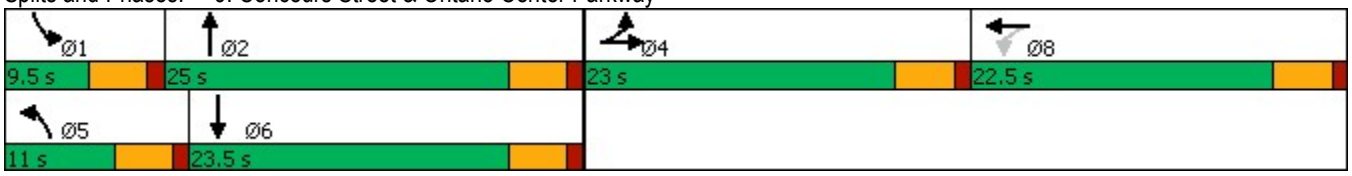
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	159	0	3	0	0	0	35	305	1	0	228	168
Future Volume (vph)	159	0	3	0	0	0	35	305	1	0	228	168
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	177	0	3	0	0	0	39	339	1	0	253	187
Shared Lane Traffic (%)	49%											
Lane Group Flow (vph)	90	90	0	0	0	0	39	340	0	0	440	0

Intersection Summary

Lane Group	EBL	EBT	NBL	NBT	SBT	Ø1	Ø8
Lane Configurations							
Traffic Volume (vph)	159	0	35	305	228		
Future Volume (vph)	159	0	35	305	228		
Turn Type	Split	NA	Prot	NA	NA		
Protected Phases	4	4	5	2	6	1	8
Permitted Phases							
Detector Phase	4	4	5	2	6		
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	9.5	22.5
Total Split (s)	23.0	23.0	11.0	25.0	23.5	9.5	22.5
Total Split (%)	28.8%	28.8%	13.8%	31.3%	29.4%	12%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		
Lead/Lag			Lead	Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	Min	Min	None	None
Act Effct Green (s)	7.6	7.6	6.3	16.1	14.5		
Actuated g/C Ratio	0.26	0.26	0.21	0.54	0.49		
v/c Ratio	0.22	0.18	0.11	0.13	0.19		
Control Delay	11.0	2.3	12.1	5.1	5.0		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	11.0	2.3	12.1	5.1	5.0		
LOS	B	A	B	A	A		
Approach Delay		6.7		5.8	5.0		
Approach LOS		A		A	A		

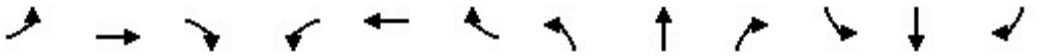
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 29.6	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.22	
Intersection Signal Delay: 5.6	Intersection LOS: A
Intersection Capacity Utilization 28.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	NBL	NBT	SBT
Lane Group Flow (vph)	90	90	39	340	440
v/c Ratio	0.22	0.18	0.11	0.13	0.19
Control Delay	11.0	2.3	12.1	5.1	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.0	2.3	12.1	5.1	5.0
Queue Length 50th (ft)	8	0	4	9	6
Queue Length 95th (ft)	44	13	25	20	34
Internal Link Dist (ft)		319		111	176
Turn Bay Length (ft)	170		115		
Base Capacity (vph)	1027	1076	379	3647	3264
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.09	0.08	0.10	0.09	0.13

Intersection Summary



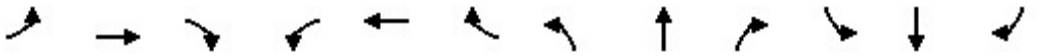
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	0	3	0	0	0	35	305	1	0	228	168
Future Volume (veh/h)	159	0	3	0	0	0	35	305	1	0	228	168
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	180	0	0	0	0	0	39	339	1	0	253	187
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	478	251	0	0	7	0	80	2504	7	7	896	417
Arrive On Green	0.14	0.00	0.00	0.00	0.00	0.00	0.05	0.50	0.50	0.00	0.28	0.28
Sat Flow, veh/h	3375	1772	0	0	1772	0	1688	4979	15	1688	3225	1502
Grp Volume(v), veh/h	180	0	0	0	0	0	39	219	121	0	253	187
Grp Sat Flow(s),veh/h/ln	1688	1772	0	0	1772	0	1688	1612	1769	1688	1612	1502
Q Serve(g_s), s	1.2	0.0	0.0	0.0	0.0	0.0	0.6	0.9	0.9	0.0	1.6	2.6
Cycle Q Clear(g_c), s	1.2	0.0	0.0	0.0	0.0	0.0	0.6	0.9	0.9	0.0	1.6	2.6
Prop In Lane	1.00		0.00	0.00		0.00	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	478	251	0	0	7	0	80	1622	890	7	896	417
V/C Ratio(X)	0.38	0.00	0.00	0.00	0.00	0.00	0.49	0.14	0.14	0.00	0.28	0.45
Avail Cap(c_a), veh/h	2465	1294	0	0	1259	0	433	2610	1432	333	2419	1126
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	9.9	0.0	0.0	0.0	0.0	0.0	11.8	3.4	3.4	0.0	7.2	7.5
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.1	0.0	0.2	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.1	0.0	0.3	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.3	0.0	0.0	0.0	0.0	0.0	16.3	3.4	3.4	0.0	7.3	8.3
LnGrp LOS	B	A	A	A	A	A	B	A	A	A	A	A
Approach Vol, veh/h		180			0			379			440	
Approach Delay, s/veh		10.3			0.0			4.7			7.7	
Approach LOS		B						A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	17.2		8.1	5.7	11.5		0.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	20.5		18.5	6.5	19.0		18.0				
Max Q Clear Time (g_c+I1), s	0.0	2.9		3.2	2.6	4.6		0.0				
Green Ext Time (p_c), s	0.0	1.9		0.5	0.0	2.4		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		7.1
HCM 6th LOS		A

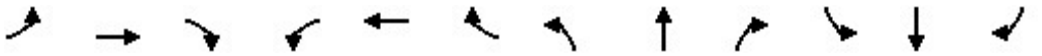
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			308			226			184			234
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



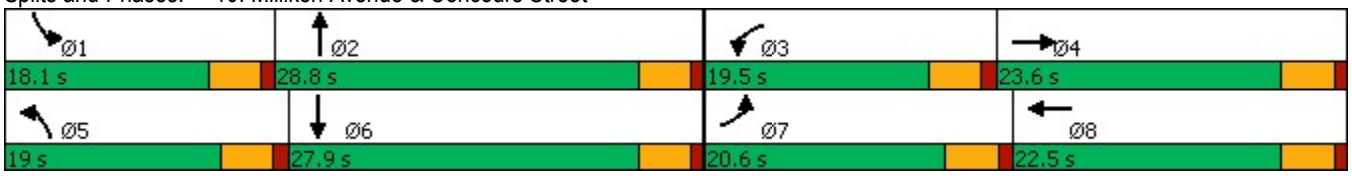
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	346	156	286	272	102	210	332	1216	254	330	1217	280
Future Volume (vph)	346	156	286	272	102	210	332	1216	254	330	1217	280
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	372	168	308	292	110	226	357	1308	273	355	1309	301
Shared Lane Traffic (%)												
Lane Group Flow (vph)	372	168	308	292	110	226	357	1308	273	355	1309	301

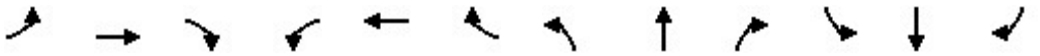
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	346	156	286	272	102	210	332	1216	254	330	1217	280
Future Volume (vph)	346	156	286	272	102	210	332	1216	254	330	1217	280
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	20.6	23.6		19.5	22.5		19.0	28.8		18.1	27.9	
Total Split (%)	22.9%	26.2%		21.7%	25.0%		21.1%	32.0%		20.1%	31.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	16.5	9.6	76.9	12.6	8.2	76.9	13.4	23.5	76.9	13.0	23.1	76.9
Actuated g/C Ratio	0.21	0.12	1.00	0.16	0.11	1.00	0.17	0.31	1.00	0.17	0.30	1.00
v/c Ratio	0.60	0.40	0.21	0.62	0.31	0.15	0.71	0.70	0.18	0.73	0.72	0.20
Control Delay	33.6	34.9	0.3	36.6	35.2	0.2	39.3	26.6	0.3	41.1	27.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	34.9	0.3	36.6	35.2	0.2	39.3	26.6	0.3	41.1	27.3	0.3
LOS	C	C	A	D	D	A	D	C	A	D	C	A
Approach Delay		21.8			23.3			25.2			25.6	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 76.9	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 24.6	Intersection LOS: C
Intersection Capacity Utilization 60.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Milliken Avenue & Concours Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	372	168	308	292	110	226	357	1308	273	355	1309	301
v/c Ratio	0.60	0.40	0.21	0.62	0.31	0.15	0.71	0.70	0.18	0.73	0.72	0.20
Control Delay	33.6	34.9	0.3	36.6	35.2	0.2	39.3	26.6	0.3	41.1	27.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	34.9	0.3	36.6	35.2	0.2	39.3	26.6	0.3	41.1	27.3	0.3
Queue Length 50th (ft)	88	40	0	70	27	0	86	165	0	86	168	0
Queue Length 95th (ft)	139	72	0	111	52	0	#137	217	0	#150	221	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	646	839	1500	568	791	1500	549	1933	1500	515	1880	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.20	0.21	0.51	0.14	0.15	0.65	0.68	0.18	0.69	0.70	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

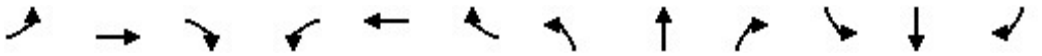
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	346	156	286	272	102	210	332	1216	254	330	1217	280
Future Volume (veh/h)	346	156	286	272	102	210	332	1216	254	330	1217	280
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	372	168	0	292	110	0	357	1308	0	355	1309	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	481	362		396	264		460	1934		455	1923	
Arrive On Green	0.17	0.11	0.00	0.14	0.08	0.00	0.16	0.32	0.00	0.16	0.32	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	372	168	0	292	110	0	357	1308	0	355	1309	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	7.8	3.0	0.0	6.1	2.0	0.0	7.5	11.9	0.0	7.5	11.9	0.0
Cycle Q Clear(g_c), s	7.8	3.0	0.0	6.1	2.0	0.0	7.5	11.9	0.0	7.5	11.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	481	362		396	264		460	1934		455	1923	
V/C Ratio(X)	0.77	0.46		0.74	0.42		0.78	0.68		0.78	0.68	
Avail Cap(c_a), veh/h	736	1010		686	952		663	2326		622	2240	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.4	26.7	0.0	26.4	27.9	0.0	25.7	18.9	0.0	25.8	19.0	0.0
Incr Delay (d2), s/veh	2.8	0.9	0.0	2.7	1.0	0.0	3.6	0.6	0.0	4.4	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	1.2	0.0	2.2	0.8	0.0	2.7	3.9	0.0	2.7	3.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.2	27.6	0.0	29.1	29.0	0.0	29.3	19.5	0.0	30.2	19.7	0.0
LnGrp LOS	C	C		C	C		C	B		C	B	
Approach Vol, veh/h		540	A		402	A		1665	A		1664	A
Approach Delay, s/veh		28.0			29.1			21.6			21.9	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.5	24.7	13.2	11.4	14.6	24.6	15.0	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.6	24.3	15.0	19.1	14.5	23.4	16.1	18.0
Max Q Clear Time (g_c+I1), s	9.5	13.9	8.1	5.0	9.5	13.9	9.8	4.0
Green Ext Time (p_c), s	0.5	6.3	0.6	0.8	0.6	5.9	0.7	0.4

Intersection Summary	
HCM 6th Ctrl Delay	23.3
HCM 6th LOS	C

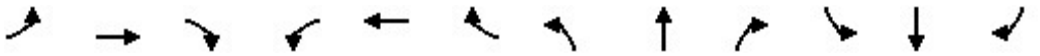
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1500	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	3940	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			182			415			182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



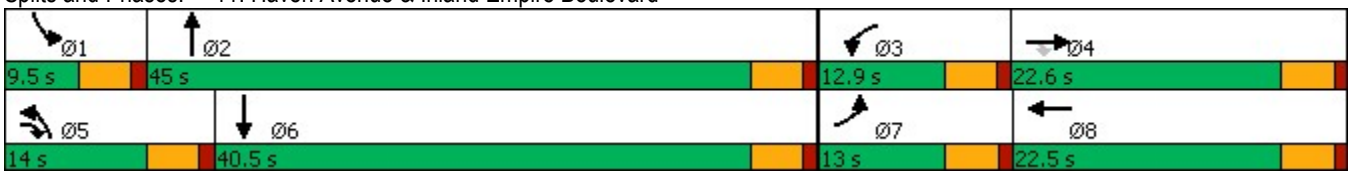
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	224	148	336	189	146	71	252	1927	570	55	1718	199
Future Volume (vph)	224	148	336	189	146	71	252	1927	570	55	1718	199
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	231	153	346	195	151	73	260	1987	588	57	1771	205
Shared Lane Traffic (%)												
Lane Group Flow (vph)	231	153	346	195	151	73	260	1987	588	57	1771	205

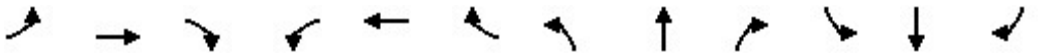
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	224	148	336	189	146	71	252	1927	570	55	1718	199
Future Volume (vph)	224	148	336	189	146	71	252	1927	570	55	1718	199
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	13.0	22.6	14.0	12.9	22.5		14.0	45.0		9.5	40.5	
Total Split (%)	14.4%	25.1%	15.6%	14.3%	25.0%		15.6%	50.0%		10.6%	45.0%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	8.5	9.4	23.4	8.1	9.0	79.9	9.5	43.3	79.9	5.0	34.8	79.9
Actuated g/C Ratio	0.11	0.12	0.29	0.10	0.11	1.00	0.12	0.54	1.00	0.06	0.44	1.00
v/c Ratio	0.75	0.39	0.70	0.49	0.40	0.05	0.76	0.60	0.39	0.31	0.67	0.14
Control Delay	52.3	36.1	28.9	39.0	36.5	0.1	50.5	14.4	0.8	41.9	19.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.3	36.1	28.9	39.0	36.5	0.1	50.5	14.4	0.8	41.9	19.6	0.2
LOS	D	D	C	D	D	A	D	B	A	D	B	A
Approach Delay		37.8			31.3			14.9			18.2	
Approach LOS		D			C			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 79.9	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 19.9	Intersection LOS: B
Intersection Capacity Utilization 64.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	231	153	346	195	151	73	260	1987	588	57	1771	205
v/c Ratio	0.75	0.39	0.70	0.49	0.40	0.05	0.76	0.60	0.39	0.31	0.67	0.14
Control Delay	52.3	36.1	28.9	39.0	36.5	0.1	50.5	14.4	0.8	41.9	19.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.3	36.1	28.9	39.0	36.5	0.1	50.5	14.4	0.8	41.9	19.6	0.2
Queue Length 50th (ft)	59	38	124	33	37	0	67	206	0	14	197	0
Queue Length 95th (ft)	#119	67	220	57	66	0	#128	262	0	34	250	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	308	761	491	415	757	1500	344	3292	1500	181	2742	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.20	0.70	0.47	0.20	0.05	0.76	0.60	0.39	0.31	0.65	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	224	148	336	189	146	71	252	1927	570	55	1718	199
Future Volume (veh/h)	224	148	336	189	146	71	252	1927	570	55	1718	199
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1477	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	231	153	346	195	151	0	260	1987	0	57	1771	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	293	724	490	288	629		323	2771		127	2362	
Arrive On Green	0.10	0.22	0.22	0.07	0.19	0.00	0.11	0.45	0.00	0.04	0.39	0.00
Sat Flow, veh/h	2910	3367	1502	3966	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	231	153	346	195	151	0	260	1987	0	57	1771	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1322	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	6.5	3.1	17.0	4.0	3.2	0.0	7.3	22.2	0.0	1.6	21.1	0.0
Cycle Q Clear(g_c), s	6.5	3.1	17.0	4.0	3.2	0.0	7.3	22.2	0.0	1.6	21.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	293	724	490	288	629		323	2771		127	2362	
V/C Ratio(X)	0.79	0.21	0.71	0.68	0.24		0.81	0.72		0.45	0.75	
Avail Cap(c_a), veh/h	294	724	490	396	720		328	2933		173	2607	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	37.0	27.2	24.8	38.1	29.1	0.0	36.5	18.6	0.0	39.3	22.3	0.0
Incr Delay (d2), s/veh	13.2	0.1	4.6	2.8	0.2	0.0	13.5	0.8	0.0	2.5	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	1.3	6.4	1.4	1.3	0.0	3.2	7.4	0.0	0.6	7.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.2	27.3	29.5	40.8	29.3	0.0	50.0	19.4	0.0	41.7	23.4	0.0
LnGrp LOS	D	C	C	D	C		D	B		D	C	
Approach Vol, veh/h		730			346	A		2247	A		1828	A
Approach Delay, s/veh		35.6			35.8			22.9			24.0	
Approach LOS		D			D			C			C	

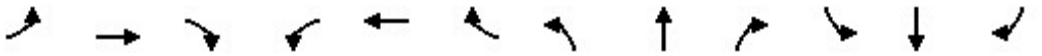
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	42.8	10.6	22.6	13.8	37.1	13.0	20.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	40.5	8.4	18.1	9.5	36.0	8.5	18.0
Max Q Clear Time (g_c+I1), s	3.6	24.2	6.0	19.0	9.3	23.1	8.5	5.2
Green Ext Time (p_c), s	0.0	12.5	0.1	0.0	0.0	9.5	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	25.9
HCM 6th LOS	C

Notes

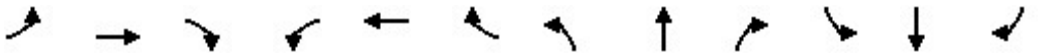
User approved changes to right turn type.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	3353	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			281			193			485			193
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



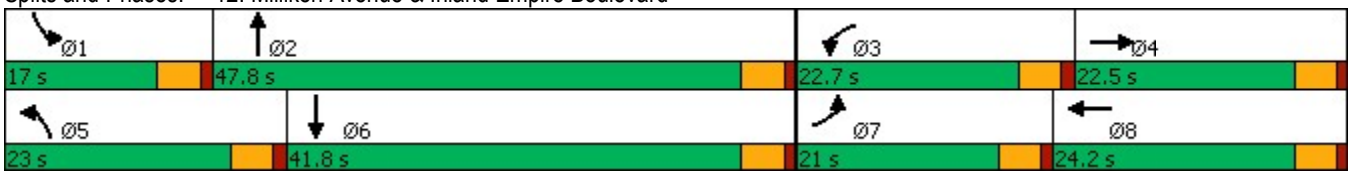
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	190	309	273	360	150	185	349	1365	794	192	1580	123
Future Volume (vph)	190	309	273	360	150	185	349	1365	794	192	1580	123
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	196	319	281	371	155	191	360	1407	819	198	1629	127
Shared Lane Traffic (%)												
Lane Group Flow (vph)	196	319	281	371	155	191	360	1407	819	198	1629	127

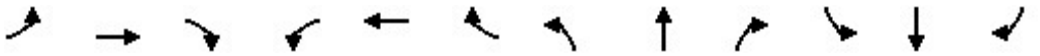
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	309	273	360	150	185	349	1365	794	192	1580	123
Future Volume (vph)	190	309	273	360	150	185	349	1365	794	192	1580	123
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	21.0	22.5		22.7	24.2		23.0	47.8		17.0	41.8	
Total Split (%)	19.1%	20.5%		20.6%	22.0%		20.9%	43.5%		15.5%	38.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	12.3	14.8	102.5	16.7	19.2	102.5	16.7	41.5	102.5	11.3	36.2	102.5
Actuated g/C Ratio	0.12	0.14	1.00	0.16	0.19	1.00	0.16	0.40	1.00	0.11	0.35	1.00
v/c Ratio	0.56	0.66	0.19	0.79	0.25	0.13	0.77	0.57	0.55	0.62	0.76	0.08
Control Delay	50.1	49.4	0.3	55.1	38.0	0.2	53.6	25.2	1.4	54.1	32.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.1	49.4	0.3	55.1	38.0	0.2	53.6	25.2	1.4	54.1	32.8	0.1
LOS	D	D	A	E	D	A	D	C	A	D	C	A
Approach Delay		32.2			36.8			21.6			32.9	
Approach LOS		C			D			C			C	

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 102.5	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 28.5	Intersection LOS: C
Intersection Capacity Utilization 72.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	196	319	281	371	155	191	360	1407	819	198	1629	127
v/c Ratio	0.56	0.66	0.19	0.79	0.25	0.13	0.77	0.57	0.55	0.62	0.76	0.08
Control Delay	50.1	49.4	0.3	55.1	38.0	0.2	53.6	25.2	1.4	54.1	32.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.1	49.4	0.3	55.1	38.0	0.2	53.6	25.2	1.4	54.1	32.8	0.1
Queue Length 50th (ft)	67	111	0	126	47	0	122	214	0	67	288	0
Queue Length 95th (ft)	103	158	0	#195	81	0	178	262	0	108	346	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	470	594	1500	518	669	1500	527	2590	1500	356	2231	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.54	0.19	0.72	0.23	0.13	0.68	0.54	0.55	0.56	0.73	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	309	273	360	150	185	349	1365	794	192	1580	123
Future Volume (veh/h)	190	309	273	360	150	185	349	1365	794	192	1580	123
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	196	319	0	371	155	0	360	1407	0	198	1629	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	267	429		447	636		437	2588		265	2228	
Arrive On Green	0.09	0.13	0.00	0.15	0.19	0.00	0.15	0.42	0.00	0.09	0.37	0.00
Sat Flow, veh/h	2910	3367	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	196	319	0	371	155	0	360	1407	0	198	1629	0
Grp Sat Flow(s),veh/h/ln	1455	1683	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	5.8	8.1	0.0	11.0	3.5	0.0	10.6	15.3	0.0	5.9	20.5	0.0
Cycle Q Clear(g_c), s	5.8	8.1	0.0	11.0	3.5	0.0	10.6	15.3	0.0	5.9	20.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	267	429		447	636		437	2588		265	2228	
V/C Ratio(X)	0.73	0.74		0.83	0.24		0.82	0.54		0.75	0.73	
Avail Cap(c_a), veh/h	542	684		598	749		608	2981		411	2568	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	39.1	37.2	0.0	36.4	30.5	0.0	36.5	19.1	0.0	39.2	24.3	0.0
Incr Delay (d2), s/veh	3.9	2.6	0.0	7.3	0.2	0.0	6.4	0.2	0.0	4.2	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	3.4	0.0	4.3	1.4	0.0	4.1	5.2	0.0	2.2	7.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.0	39.8	0.0	43.6	30.7	0.0	42.9	19.2	0.0	43.4	25.2	0.0
LnGrp LOS	D	D		D	C		D	B		D	C	
Approach Vol, veh/h		515	A		526	A		1767	A		1827	A
Approach Delay, s/veh		41.0			39.8			24.1			27.2	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.6	42.1	18.1	15.8	17.8	36.9	12.6	21.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	43.3	18.2	18.0	18.5	37.3	16.5	19.7
Max Q Clear Time (g_c+I1), s	7.9	17.3	13.0	10.1	12.6	22.5	7.8	5.5
Green Ext Time (p_c), s	0.3	12.1	0.6	1.2	0.7	9.9	0.4	0.7

Intersection Summary	
HCM 6th Ctrl Delay	29.0
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.924	0.850				
Flt Protected	0.976					
Satd. Flow (prot)	2916	1365	6071	0	0	6071
Flt Permitted	0.976					
Satd. Flow (perm)	2916	1365	6071	0	0	6071
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	3	3				
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	246	506	2200	0	0	1462
Future Volume (vph)	246	506	2200	0	0	1462
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.98	0.98	0.98	0.92	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	251	516	2245	0	0	1492
Shared Lane Traffic (%)		50%				
Lane Group Flow (vph)	509	258	2245	0	0	1492

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	246	506	2200	1462
Future Volume (vph)	246	506	2200	1462
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	36.0	36.0
Total Split (%)	40.0%	40.0%	60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	15.4	15.4	31.6	31.6
Actuated g/C Ratio	0.27	0.27	0.56	0.56
v/c Ratio	0.63	0.68	0.66	0.44
Control Delay	21.4	27.9	10.2	8.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.4	27.9	10.2	8.1
LOS	C	C	B	A
Approach Delay	23.6		10.2	8.1
Approach LOS	C		B	A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56.1	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 11.8	Intersection LOS: B
Intersection Capacity Utilization 75.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	509	258	2245	1492
v/c Ratio	0.63	0.68	0.66	0.44
Control Delay	21.4	27.9	10.2	8.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.4	27.9	10.2	8.1
Queue Length 50th (ft)	75	82	139	77
Queue Length 95th (ft)	117	157	202	114
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	1019	478	3423	3423
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.50	0.54	0.66	0.44

Intersection Summary

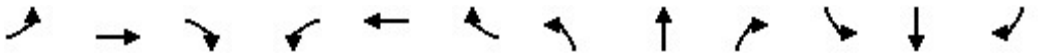
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	246	506	2200	0	0	1462
Future Volume (veh/h)	246	506	2200	0	0	1462
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1673	1772	1772	0	0	1772
Adj Flow Rate, veh/h	251	516	2245	0	0	1492
Peak Hour Factor	0.98	0.98	0.98	0.92	0.98	0.98
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	387	729	3510	0	0	3510
Arrive On Green	0.24	0.24	0.58	0.00	0.00	0.58
Sat Flow, veh/h	1594	3003	6592	0	0	6592
Grp Volume(v), veh/h	251	516	2245	0	0	1492
Grp Sat Flow(s),veh/h/ln	1594	1502	1524	0	0	1524
Q Serve(g_s), s	7.0	7.8	12.3	0.0	0.0	6.8
Cycle Q Clear(g_c), s	7.0	7.8	12.3	0.0	0.0	6.8
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	387	729	3510	0	0	3510
V/C Ratio(X)	0.65	0.71	0.64	0.00	0.00	0.43
Avail Cap(c_a), veh/h	627	1181	3872	0	0	3872
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	16.9	17.2	7.1	0.0	0.0	5.9
Incr Delay (d2), s/veh	1.8	1.3	0.3	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	2.5	2.7	0.0	0.0	1.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.7	18.5	7.4	0.0	0.0	6.0
LnGrp LOS	B	B	A	A	A	A
Approach Vol, veh/h	767		2245			1492
Approach Delay, s/veh	18.5		7.4			6.0
Approach LOS	B		A			A

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	33.1			33.1	16.5
Change Period (Y+Rc), s	4.5			4.5	4.5
Max Green Setting (Gmax), s	31.5			31.5	19.5
Max Q Clear Time (g_c+I1), s	14.3			8.8	9.8
Green Ext Time (p_c), s	14.3			12.0	2.2

Intersection Summary	
HCM 6th Ctrl Delay	8.8
HCM 6th LOS	A

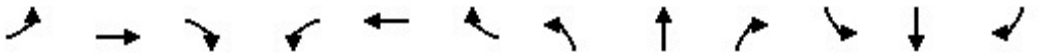
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2891	1765	1500	2891	3353	1500	2891	6071	1500	2891	6071	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			136			218			55
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



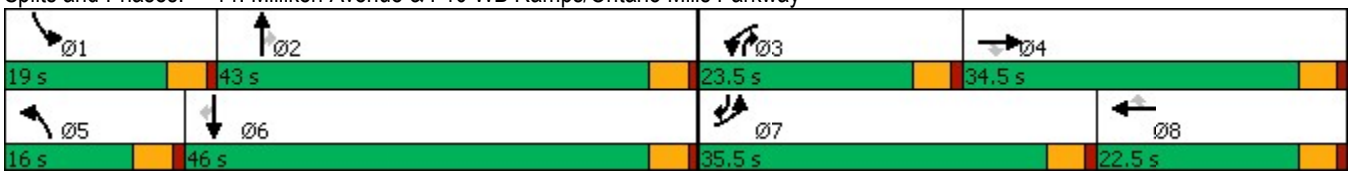
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	852	229	130	277	345	103	210	1373	420	305	1252	798
Future Volume (vph)	852	229	130	277	345	103	210	1373	420	305	1252	798
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	916	246	140	298	371	111	226	1476	452	328	1346	858
Shared Lane Traffic (%)												
Lane Group Flow (vph)	916	246	140	298	371	111	226	1476	452	328	1346	858

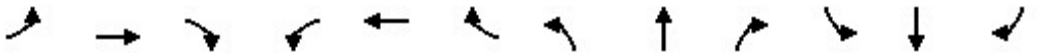
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	852	229	130	277	345	103	210	1373	420	305	1252	798
Future Volume (vph)	852	229	130	277	345	103	210	1373	420	305	1252	798
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	35.5	34.5	34.5	23.5	22.5	22.5	16.0	43.0	23.5	19.0	46.0	35.5
Total Split (%)	29.6%	28.8%	28.8%	19.6%	18.8%	18.8%	13.3%	35.8%	19.6%	15.8%	38.3%	29.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	31.1	31.0	31.0	16.7	16.6	16.6	11.3	37.2	58.4	14.5	40.4	75.9
Actuated g/C Ratio	0.26	0.26	0.26	0.14	0.14	0.14	0.10	0.32	0.50	0.12	0.34	0.65
v/c Ratio	1.20	0.53	0.30	0.73	0.78	0.34	0.81	0.77	0.53	0.92	0.64	0.87
Control Delay	140.4	42.8	15.3	59.1	61.2	7.2	75.2	39.5	11.9	82.6	34.3	27.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	140.4	42.8	15.3	59.1	61.2	7.2	75.2	39.5	11.9	82.6	34.3	27.2
LOS	F	D	B	E	E	A	E	D	B	F	C	C
Approach Delay		108.5			52.7			37.4			38.1	
Approach LOS		F			D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.4	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 53.1	Intersection LOS: D
Intersection Capacity Utilization 85.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	916	246	140	298	371	111	226	1476	452	328	1346	858
v/c Ratio	1.20	0.53	0.30	0.73	0.78	0.34	0.81	0.77	0.53	0.92	0.64	0.87
Control Delay	140.4	42.8	15.3	59.1	61.2	7.2	75.2	39.5	11.9	82.6	34.3	27.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	140.4	42.8	15.3	59.1	61.2	7.2	75.2	39.5	11.9	82.6	34.3	27.2
Queue Length 50th (ft)	~451	166	27	113	146	0	90	297	109	131	253	477
Queue Length 95th (ft)	#578	253	82	161	201	34	#155	342	199	#222	294	#821
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	764	466	466	468	514	345	284	1994	880	357	2149	989
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.20	0.53	0.30	0.64	0.72	0.32	0.80	0.74	0.51	0.92	0.63	0.87

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	852	229	130	277	345	103	210	1373	420	305	1252	798
Future Volume (veh/h)	852	229	130	277	345	103	210	1373	420	305	1252	798
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1772	1772	1575	1772	1772	1575	1772	1772	1575	1772	1772
Adj Flow Rate, veh/h	916	246	140	298	371	111	226	1476	452	328	1346	858
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	771	489	414	354	446	199	273	1979	670	361	2163	931
Arrive On Green	0.27	0.28	0.28	0.12	0.13	0.13	0.09	0.32	0.32	0.12	0.35	0.35
Sat Flow, veh/h	2910	1772	1502	2910	3367	1502	2910	6095	1502	2910	6095	1502
Grp Volume(v), veh/h	916	246	140	298	371	111	226	1476	452	328	1346	858
Grp Sat Flow(s),veh/h/ln	1455	1772	1502	1455	1683	1502	1455	1524	1502	1455	1524	1502
Q Serve(g_s), s	31.0	13.7	8.7	11.7	12.6	8.1	8.9	25.2	27.9	13.0	21.4	41.5
Cycle Q Clear(g_c), s	31.0	13.7	8.7	11.7	12.6	8.1	8.9	25.2	27.9	13.0	21.4	41.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	771	489	414	354	446	199	273	1979	670	361	2163	931
V/C Ratio(X)	1.19	0.50	0.34	0.84	0.83	0.56	0.83	0.75	0.67	0.91	0.62	0.92
Avail Cap(c_a), veh/h	771	489	414	473	518	231	286	2007	677	361	2163	931
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.0	35.6	33.8	50.3	49.5	47.5	52.1	35.2	25.7	50.6	31.2	19.7
Incr Delay (d2), s/veh	97.2	0.8	0.5	10.0	9.8	2.4	17.4	1.5	2.6	26.1	0.6	14.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.4	6.0	3.2	4.8	5.9	3.2	3.9	9.5	10.3	6.0	7.9	22.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	140.1	36.4	34.3	60.3	59.3	50.0	69.5	36.7	28.3	76.7	31.8	33.9
LnGrp LOS	F	D	C	E	E	D	E	D	C	E	C	C
Approach Vol, veh/h		1302			780			2154			2532	
Approach Delay, s/veh		109.2			58.4			38.4			38.3	
Approach LOS		F			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	42.5	18.7	36.8	15.5	46.0	35.5	20.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	38.5	19.0	30.0	11.5	41.5	31.0	18.0
Max Q Clear Time (g_c+I1), s	15.0	29.9	13.7	15.7	10.9	43.5	33.0	14.6
Green Ext Time (p_c), s	0.0	6.6	0.5	1.6	0.0	0.0	0.0	0.9

Intersection Summary	
HCM 6th Ctrl Delay	54.3
HCM 6th LOS	D

Notes

User approved changes to right turn type.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.993	0.850				
Flt Protected	0.954					
Satd. Flow (prot)	3063	1365	0	6071	6071	0
Flt Permitted	0.954					
Satd. Flow (perm)	3063	1365	0	6071	6071	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	5	5				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

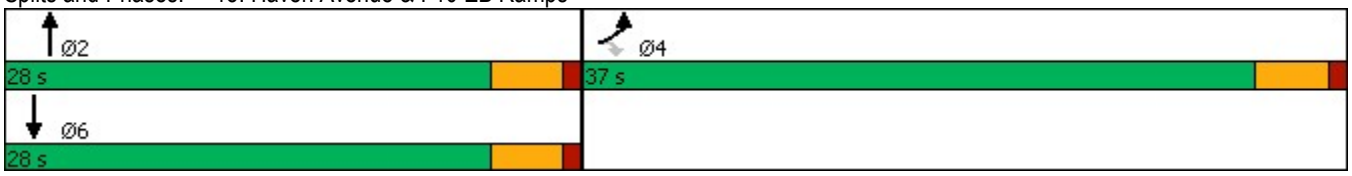
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	1148	541	0	1632	1364	0
Future Volume (vph)	1148	541	0	1632	1364	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1184	558	0	1682	1406	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	1240	502	0	1682	1406	0

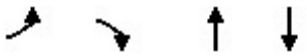
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1148	541	1632	1364
Future Volume (vph)	1148	541	1632	1364
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	37.0	37.0	28.0	28.0
Total Split (%)	56.9%	56.9%	43.1%	43.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	29.7	29.7	23.4	23.4
Actuated g/C Ratio	0.48	0.48	0.38	0.38
v/c Ratio	0.85	0.77	0.74	0.62
Control Delay	20.8	22.7	19.6	17.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.8	22.7	19.6	17.6
LOS	C	C	B	B
Approach Delay	21.4		19.6	17.6
Approach LOS	C		B	B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 62.2	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 19.7	Intersection LOS: B
Intersection Capacity Utilization 75.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1240	502	1682	1406
v/c Ratio	0.85	0.77	0.74	0.62
Control Delay	20.8	22.7	19.6	17.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.8	22.7	19.6	17.6
Queue Length 50th (ft)	197	159	166	131
Queue Length 95th (ft)	279	#300	208	166
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	1612	720	2306	2306
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.77	0.70	0.73	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1148	541	0	1632	1364	0
Future Volume (veh/h)	1148	541	0	1632	1364	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1772	0	1772	1772	0
Adj Flow Rate, veh/h	1184	558	0	1682	1406	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	1470	692	0	2320	2320	0
Arrive On Green	0.46	0.46	0.00	0.38	0.38	0.00
Sat Flow, veh/h	3188	1502	0	6592	6592	0
Grp Volume(v), veh/h	1184	558	0	1682	1406	0
Grp Sat Flow(s),veh/h/ln	1594	1502	0	1524	1524	0
Q Serve(g_s), s	18.1	18.1	0.0	13.4	10.6	0.0
Cycle Q Clear(g_c), s	18.1	18.1	0.0	13.4	10.6	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	1470	692	0	2320	2320	0
V/C Ratio(X)	0.81	0.81	0.00	0.73	0.61	0.00
Avail Cap(c_a), veh/h	1822	858	0	2520	2520	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.1	13.1	0.0	15.1	14.2	0.0
Incr Delay (d2), s/veh	2.2	4.6	0.0	1.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	5.9	0.0	4.2	3.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.4	17.8	0.0	16.0	14.5	0.0
LnGrp LOS	B	B	A	B	B	A
Approach Vol, veh/h	1742			1682	1406	
Approach Delay, s/veh	16.1			16.0	14.5	
Approach LOS	B			B	B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		26.1		30.7		26.1
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		23.5		32.5		23.5
Max Q Clear Time (g_c+I1), s		15.4		20.1		12.6
Green Ext Time (p_c), s		6.2		6.1		7.0

Intersection Summary	
HCM 6th Ctrl Delay	15.6
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1600	1800	1600	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	2891	1500	2891	6071	6071	1500
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	2891	1500	2891	6071	6071	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		10				127
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	887	222	158	1166	855	829
Future Volume (vph)	887	222	158	1166	855	829
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	914	229	163	1202	881	855
Shared Lane Traffic (%)						
Lane Group Flow (vph)	914	229	163	1202	881	855

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	887	222	158	1166	855	829
Future Volume (vph)	887	222	158	1166	855	829
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	39.0	12.0	12.0	36.0	24.0	39.0
Total Split (%)	52.0%	16.0%	16.0%	48.0%	32.0%	52.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	28.3	40.3	7.4	28.5	16.5	49.4
Actuated g/C Ratio	0.43	0.61	0.11	0.43	0.25	0.75
v/c Ratio	0.74	0.25	0.51	0.46	0.58	0.74
Control Delay	20.0	6.7	36.2	14.6	24.1	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	6.7	36.2	14.6	24.1	8.4
LOS	C	A	D	B	C	A
Approach Delay	17.4			17.2	16.3	
Approach LOS	B			B	B	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 66	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 16.9	Intersection LOS: B
Intersection Capacity Utilization 67.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	914	229	163	1202	881	855
v/c Ratio	0.74	0.25	0.51	0.46	0.58	0.74
Control Delay	20.0	6.7	36.2	14.6	24.1	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	6.7	36.2	14.6	24.1	8.4
Queue Length 50th (ft)	157	37	34	102	95	112
Queue Length 95th (ft)	230	72	67	142	134	222
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	1549	926	336	2970	1838	1298
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.25	0.49	0.40	0.48	0.66

Intersection Summary

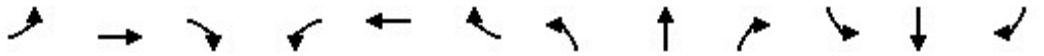
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	887	222	158	1166	855	829
Future Volume (veh/h)	887	222	158	1166	855	829
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1575	1772	1575	1772	1772	1772
Adj Flow Rate, veh/h	914	229	163	1202	881	855
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1113	699	242	2875	1925	1049
Arrive On Green	0.38	0.38	0.08	0.47	0.32	0.32
Sat Flow, veh/h	2910	1502	2910	6343	6343	1502
Grp Volume(v), veh/h	914	229	163	1202	881	855
Grp Sat Flow(s),veh/h/ln	1455	1502	1455	1524	1524	1502
Q Serve(g_s), s	17.5	5.9	3.4	8.0	7.1	19.5
Cycle Q Clear(g_c), s	17.5	5.9	3.4	8.0	7.1	19.5
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1113	699	242	2875	1925	1049
V/C Ratio(X)	0.82	0.33	0.67	0.42	0.46	0.82
Avail Cap(c_a), veh/h	1626	964	353	3110	1925	1049
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.2	10.4	27.5	10.7	16.9	5.8
Incr Delay (d2), s/veh	2.3	0.3	3.3	0.1	0.2	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.1	1.2	2.3	2.3	13.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.4	10.7	30.8	10.8	17.1	10.8
LnGrp LOS	B	B	C	B	B	B
Approach Vol, veh/h	1143			1365	1736	
Approach Delay, s/veh	17.7			13.2	14.0	
Approach LOS	B			B	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		33.6		28.1	9.6	24.0
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		31.5		34.5	7.5	19.5
Max Q Clear Time (g_c+I1), s		10.0		19.5	5.4	21.5
Green Ext Time (p_c), s		9.1		4.2	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	14.7
HCM 6th LOS	B

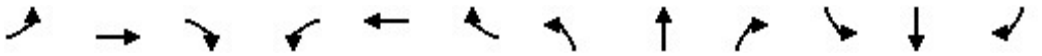
Appendix H

Intersection LOS Analysis Sheets
Horizon Year (2040) Without Project Conditions



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.962				0.850			0.850		0.994	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	4892	0	3072	3539	1583	3072	5085	1583	3072	6369	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	4892	0	3072	3539	1583	3072	5085	1583	3072	6369	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		67				149			238		9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



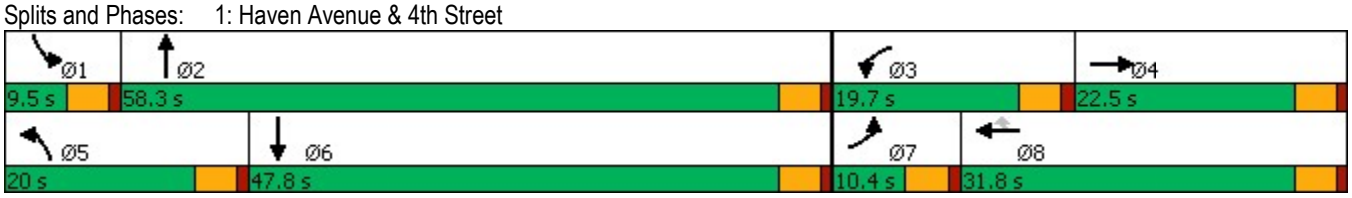
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	130	420	143	342	731	185	293	2155	676	124	1728	77
Future Volume (vph)	130	420	143	342	731	185	293	2155	676	124	1728	77
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	143	462	157	376	803	203	322	2368	743	136	1899	85
Shared Lane Traffic (%)												
Lane Group Flow (vph)	143	619	0	376	803	203	322	2368	743	136	1984	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	130	420	342	731	185	293	2155	676	124	1728
Future Volume (vph)	130	420	342	731	185	293	2155	676	124	1728
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	10.4	22.5	19.7	31.8	31.8	20.0	58.3		9.5	47.8
Total Split (%)	9.5%	20.5%	17.9%	28.9%	28.9%	18.2%	53.0%		8.6%	43.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	5.9	17.9	15.1	27.1	27.1	14.7	53.8	109.8	5.0	44.0
Actuated g/C Ratio	0.05	0.16	0.14	0.25	0.25	0.13	0.49	1.00	0.05	0.40
v/c Ratio	0.87	0.72	0.89	0.92	0.40	0.78	0.95	0.47	0.98	0.78
Control Delay	95.2	44.3	70.6	56.9	13.1	60.0	36.9	1.0	123.9	31.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	95.2	44.3	70.6	56.9	13.1	60.0	36.9	1.0	123.9	31.2
LOS	F	D	E	E	B	E	D	A	F	C
Approach Delay		53.9		54.2			31.3			37.1
Approach LOS		D		D			C			D

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 109.8	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 39.3	Intersection LOS: D
Intersection Capacity Utilization 85.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Haven Avenue & 4th Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	143	619	376	803	203	322	2368	743	136	1984
v/c Ratio	0.87	0.72	0.89	0.92	0.40	0.78	0.95	0.47	0.98	0.78
Control Delay	95.2	44.3	70.6	56.9	13.1	60.0	36.9	1.0	123.9	31.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	95.2	44.3	70.6	56.9	13.1	60.0	36.9	1.0	123.9	31.2
Queue Length 50th (ft)	52	136	136	291	30	113	566	0	50	351
Queue Length 95th (ft)	#111	180	#220	#406	94	#171	#701	0	#114	400
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	164	857	425	879	505	433	2491	1583	139	2560
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.72	0.88	0.91	0.40	0.74	0.95	0.47	0.98	0.78

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

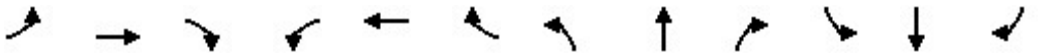
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	420	143	342	731	185	293	2155	676	124	1728	77
Future Volume (veh/h)	130	420	143	342	731	185	293	2155	676	124	1728	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	143	462	157	376	803	203	322	2368	0	136	1899	85
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	167	613	201	426	871	389	380	2507		141	2633	118
Arrive On Green	0.05	0.16	0.16	0.14	0.25	0.25	0.12	0.49	0.00	0.05	0.41	0.41
Sat Flow, veh/h	3092	3804	1247	3092	3554	1585	3092	5106	1585	3092	6360	285
Grp Volume(v), veh/h	143	412	207	376	803	203	322	2368	0	136	1441	543
Grp Sat Flow(s),veh/h/ln	1546	1702	1646	1546	1777	1585	1546	1702	1585	1546	1609	1819
Q Serve(g_s), s	5.0	12.6	13.2	13.1	24.1	12.1	11.2	48.2	0.0	4.8	27.3	27.3
Cycle Q Clear(g_c), s	5.0	12.6	13.2	13.1	24.1	12.1	11.2	48.2	0.0	4.8	27.3	27.3
Prop In Lane	1.00		0.76	1.00		1.00	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	167	549	265	426	871	389	380	2507		141	1997	753
V/C Ratio(X)	0.86	0.75	0.78	0.88	0.92	0.52	0.85	0.94		0.96	0.72	0.72
Avail Cap(c_a), veh/h	167	559	270	429	886	395	437	2507		141	1997	753
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.4	43.8	44.1	46.4	40.3	35.8	47.1	26.5	0.0	52.2	26.8	26.8
Incr Delay (d2), s/veh	33.5	5.5	13.5	18.9	14.7	1.2	13.0	9.0	0.0	64.5	2.3	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	5.7	6.4	6.1	12.2	4.8	5.0	20.6	0.0	3.1	10.7	12.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.9	49.4	57.6	65.2	55.0	37.0	60.1	35.4	0.0	116.7	29.1	32.7
LnGrp LOS	F	D	E	E	E	D	E	D		F	C	C
Approach Vol, veh/h		762			1382			2690	A		2120	
Approach Delay, s/veh		58.3			55.1			38.4			35.7	
Approach LOS		E			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	58.3	19.6	22.2	18.0	49.8	10.4	31.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	53.8	15.2	18.0	15.5	43.3	5.9	27.3
Max Q Clear Time (g_c+I1), s	6.8	50.2	15.1	15.2	13.2	29.3	7.0	26.1
Green Ext Time (p_c), s	0.0	3.4	0.0	1.1	0.3	10.6	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	43.1
HCM 6th LOS	D

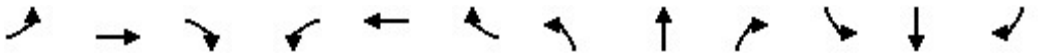
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.994				0.850			0.850		0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	6369	0	1676	5085	1583	1676	1863	1583	1676	3008	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1676	6369	0	1676	5085	1583	1676	1863	1583	1676	3008	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11				164			164		421	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	54	693	29	1	956	109	4	1	1	176	0	4
Future Volume (vph)	54	693	29	1	956	109	4	1	1	176	0	4
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	60	770	32	1	1062	121	4	1	1	196	0	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	802	0	1	1062	121	4	1	1	196	4	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	54	693	1	956	109	4	1	1	176	0
Future Volume (vph)	54	693	1	956	109	4	1	1	176	0
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			2		
Detector Phase	7	4	3	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5
Total Split (s)	9.5	22.5	9.5	22.5	22.5	11.3	23.0	23.0	15.0	26.7
Total Split (%)	13.6%	32.1%	13.6%	32.1%	32.1%	16.1%	32.9%	32.9%	21.4%	38.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	5.1	20.8	5.1	17.3	17.3	5.8	5.7	5.7	10.0	18.3
Actuated g/C Ratio	0.10	0.40	0.10	0.33	0.33	0.11	0.11	0.11	0.19	0.35
v/c Ratio	0.37	0.31	0.01	0.63	0.19	0.02	0.00	0.00	0.61	0.00
Control Delay	31.1	11.3	24.0	17.3	2.4	23.2	23.0	0.0	30.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.1	11.3	24.0	17.3	2.4	23.2	23.0	0.0	30.8	0.0
LOS	C	B	C	B	A	C	C	A	C	A
Approach Delay		12.7		15.8			19.3			30.1
Approach LOS		B		B			B			C

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 51.9	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 15.9	Intersection LOS: B
Intersection Capacity Utilization 50.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	60	802	1	1062	121	4	1	1	196	4
v/c Ratio	0.37	0.31	0.01	0.63	0.19	0.02	0.00	0.00	0.61	0.00
Control Delay	31.1	11.3	24.0	17.3	2.4	23.2	23.0	0.0	30.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.1	11.3	24.0	17.3	2.4	23.2	23.0	0.0	30.8	0.0
Queue Length 50th (ft)	20	43	0	112	0	1	0	0	62	0
Queue Length 95th (ft)	51	83	4	153	18	9	4	0	#138	0
Internal Link Dist (ft)		2546		362			269			358
Turn Bay Length (ft)	130		130		145	165		165	50	
Base Capacity (vph)	164	2678	164	1794	664	223	675	678	345	1547
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.30	0.01	0.59	0.18	0.02	0.00	0.00	0.57	0.00

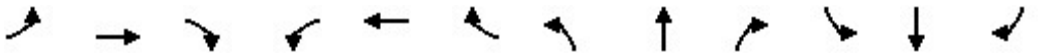
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	693	29	1	956	109	4	1	1	176	0	4
Future Volume (veh/h)	54	693	29	1	956	109	4	1	1	176	0	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1870	1870	1772	1870	1870	1772	1870	1870	1772	1870	1870
Adj Flow Rate, veh/h	60	770	32	1	1062	121	4	1	1	196	0	4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	97	2357	97	4	1598	496	9	197	167	246	436	389
Arrive On Green	0.06	0.37	0.37	0.00	0.31	0.31	0.01	0.11	0.11	0.15	0.00	0.25
Sat Flow, veh/h	1688	6385	264	1688	5106	1585	1688	1870	1585	1688	1777	1585
Grp Volume(v), veh/h	60	581	221	1	1062	121	4	1	1	196	0	4
Grp Sat Flow(s),veh/h/ln	1688	1609	1823	1688	1702	1585	1688	1870	1585	1688	1777	1585
Q Serve(g_s), s	1.7	4.1	4.1	0.0	8.6	2.7	0.1	0.0	0.0	5.3	0.0	0.1
Cycle Q Clear(g_c), s	1.7	4.1	4.1	0.0	8.6	2.7	0.1	0.0	0.0	5.3	0.0	0.1
Prop In Lane	1.00		0.14	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	97	1782	673	4	1598	496	9	197	167	246	436	389
V/C Ratio(X)	0.62	0.33	0.33	0.28	0.66	0.24	0.44	0.01	0.01	0.80	0.00	0.01
Avail Cap(c_a), veh/h	177	1826	690	177	1933	600	241	728	617	373	829	740
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.9	10.8	10.8	23.7	14.2	12.1	23.6	19.1	19.1	19.6	0.0	13.6
Incr Delay (d2), s/veh	6.2	0.1	0.3	38.4	0.7	0.3	29.7	0.0	0.0	6.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	1.2	1.4	0.0	2.9	0.8	0.1	0.0	0.0	2.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.1	10.9	11.1	62.1	14.8	12.4	53.3	19.1	19.1	26.5	0.0	13.6
LnGrp LOS	C	B	B	E	B	B	D	B	B	C	A	B
Approach Vol, veh/h		862			1184			6			200	
Approach Delay, s/veh		12.1			14.6			41.9			26.2	
Approach LOS		B			B			D			C	

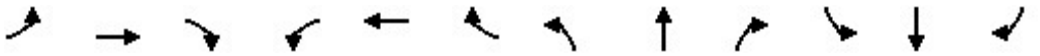
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.4	9.5	4.6	22.1	4.8	16.2	7.2	19.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	18.5	5.0	18.0	6.8	22.2	5.0	18.0
Max Q Clear Time (g_c+I1), s	7.3	2.0	2.0	6.1	2.1	2.1	3.7	10.6
Green Ext Time (p_c), s	0.2	0.0	0.0	4.2	0.0	0.0	0.0	4.3

Intersection Summary	
HCM 6th Ctrl Delay	14.8
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1800	1900	1900	1800	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.996				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.956	
Satd. Flow (prot)	3072	6401	0	1676	5065	0	1676	1863	1583	0	1781	1583
Flt Permitted	0.950			0.950			0.720				0.739	
Satd. Flow (perm)	3072	6401	0	1676	5065	0	1271	1863	1583	0	1377	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			7				109			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



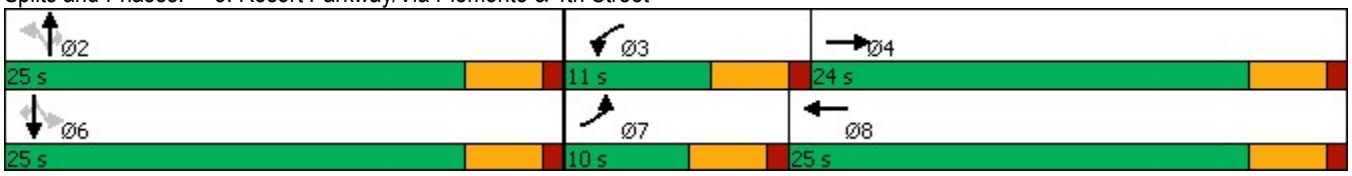
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	20	716	6	22	983	28	12	4	16	48	4	23
Future Volume (vph)	20	716	6	22	983	28	12	4	16	48	4	23
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	22	770	6	24	1057	30	13	4	17	52	4	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	776	0	24	1087	0	13	4	17	0	56	25

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	20	716	22	983	12	4	16	48	4	23
Future Volume (vph)	20	716	22	983	12	4	16	48	4	23
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8		2			6	
Permitted Phases					2		2	6		6
Detector Phase	7	4	3	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	10.0	24.0	11.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (%)	16.7%	40.0%	18.3%	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	5.8	15.6	6.2	15.8	7.1	7.1	7.1		7.1	7.1
Actuated g/C Ratio	0.17	0.46	0.18	0.47	0.21	0.21	0.21		0.21	0.21
v/c Ratio	0.04	0.26	0.08	0.46	0.05	0.01	0.04		0.19	0.06
Control Delay	16.2	6.4	16.0	7.3	14.2	14.0	0.2		15.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	16.2	6.4	16.0	7.3	14.2	14.0	0.2		15.4	0.3
LOS	B	A	B	A	B	B	A		B	A
Approach Delay		6.7		7.5		7.2			10.7	
Approach LOS		A		A		A			B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 33.7	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.46	
Intersection Signal Delay: 7.3	Intersection LOS: A
Intersection Capacity Utilization 39.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	22	776	24	1087	13	4	17	56	25
v/c Ratio	0.04	0.26	0.08	0.46	0.05	0.01	0.04	0.19	0.06
Control Delay	16.2	6.4	16.0	7.3	14.2	14.0	0.2	15.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	6.4	16.0	7.3	14.2	14.0	0.2	15.4	0.3
Queue Length 50th (ft)	1	17	3	34	2	1	0	8	0
Queue Length 95th (ft)	10	59	22	109	14	7	0	38	0
Internal Link Dist (ft)		362		428		302		378	
Turn Bay Length (ft)	220		125		115		115		110
Base Capacity (vph)	527	3902	340	3248	814	1193	1053	882	1053
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.20	0.07	0.33	0.02	0.00	0.02	0.06	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	716	6	22	983	28	12	4	16	48	4	23
Future Volume (veh/h)	20	716	6	22	983	28	12	4	16	48	4	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1772	1870	1870	1772	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	22	770	6	24	1057	30	13	4	17	52	4	25
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	86	2660	21	51	2058	58	379	288	244	410	24	244
Arrive On Green	0.03	0.40	0.40	0.03	0.40	0.40	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	3092	6635	52	1688	5104	145	1308	1870	1585	1275	156	1585
Grp Volume(v), veh/h	22	560	216	24	705	382	13	4	17	56	0	25
Grp Sat Flow(s),veh/h/ln	1546	1609	1861	1688	1702	1844	1308	1870	1585	1431	0	1585
Q Serve(g_s), s	0.2	2.6	2.6	0.5	5.1	5.1	0.3	0.1	0.3	0.9	0.0	0.4
Cycle Q Clear(g_c), s	0.2	2.6	2.6	0.5	5.1	5.1	1.4	0.1	0.3	1.1	0.0	0.4
Prop In Lane	1.00		0.03	1.00		0.08	1.00		1.00	0.93		1.00
Lane Grp Cap(c), veh/h	86	1935	746	51	1373	744	379	288	244	434	0	244
V/C Ratio(X)	0.26	0.29	0.29	0.47	0.51	0.51	0.03	0.01	0.07	0.13	0.00	0.10
Avail Cap(c_a), veh/h	523	2895	1116	337	2147	1163	1003	1179	1000	1109	0	1000
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.5	6.6	6.6	15.5	7.3	7.3	12.7	11.7	11.8	12.1	0.0	11.8
Incr Delay (d2), s/veh	1.6	0.1	0.2	6.8	0.3	0.6	0.0	0.0	0.1	0.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.5	0.7	0.2	1.2	1.3	0.1	0.0	0.1	0.3	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.0	6.7	6.8	22.3	7.6	7.9	12.7	11.7	11.9	12.2	0.0	12.0
LnGrp LOS	B	A	A	C	A	A	B	B	B	B	A	B
Approach Vol, veh/h		798			1111			34			81	
Approach Delay, s/veh		7.0			8.0			12.2			12.1	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	5.5	17.5		9.5	5.4	17.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		20.5	6.5	19.5		20.5	5.5	20.5				
Max Q Clear Time (g_c+I1), s		3.4	2.5	4.6		3.1	2.2	7.1				
Green Ext Time (p_c), s		0.1	0.0	4.5		0.3	0.0	6.0				

Intersection Summary	
HCM 6th Ctrl Delay	7.8
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.994					0.865
Flt Protected						
Satd. Flow (prot)	5055	0	0	5085	0	1611
Flt Permitted						
Satd. Flow (perm)	5055	0	0	5085	0	1611
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	754	29	0	973	0	4
Future Volume (vph)	754	29	0	973	0	4
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	820	32	0	1058	0	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	852	0	0	1058	0	4

Intersection Summary

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	754	29	0	973	0	4
Future Vol, veh/h	754	29	0	973	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	820	32	0	1058	0	4

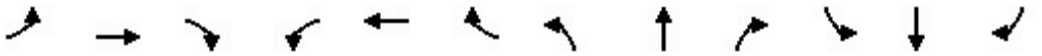
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	426
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	493
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	493
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	493	-	-	-
HCM Lane V/C Ratio	0.009	-	-	-
HCM Control Delay (s)	12.4	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	5085	1583	3072	5085	1583	3072	6408	1583	3072	6305	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	5085	1583	3072	5085	1583	3072	6408	1583	3072	6305	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			220			278			73		29	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



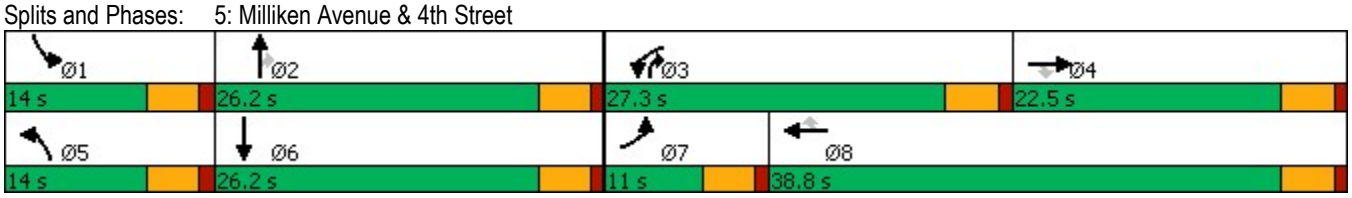
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	205	532	226	645	1649	549	278	1307	204	277	1144	133
Future Volume (vph)	205	532	226	645	1649	549	278	1307	204	277	1144	133
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	220	572	243	694	1773	590	299	1405	219	298	1230	143
Shared Lane Traffic (%)												
Lane Group Flow (vph)	220	572	243	694	1773	590	299	1405	219	298	1373	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	205	532	226	645	1649	549	278	1307	204	277	1144
Future Volume (vph)	205	532	226	645	1649	549	278	1307	204	277	1144
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	11.0	22.5	22.5	27.3	38.8	38.8	14.0	26.2	27.3	14.0	26.2
Total Split (%)	12.2%	25.0%	25.0%	30.3%	43.1%	43.1%	15.6%	29.1%	30.3%	15.6%	29.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	6.5	18.5	18.5	22.3	34.3	34.3	9.5	21.7	48.5	9.5	21.7
Actuated g/C Ratio	0.07	0.21	0.21	0.25	0.38	0.38	0.11	0.24	0.54	0.11	0.24
v/c Ratio	1.00	0.55	0.49	0.91	0.92	0.76	0.92	0.91	0.25	0.92	0.89
Control Delay	103.6	34.5	9.8	50.7	35.3	19.9	75.4	43.2	7.8	74.8	40.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.6	34.5	9.8	50.7	35.3	19.9	75.4	43.2	7.8	74.8	40.9
LOS	F	C	A	D	D	B	E	D	A	E	D
Approach Delay		43.4			35.9			44.2			47.0
Approach LOS		D			D			D			D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 41.4	Intersection LOS: D
Intersection Capacity Utilization 81.2%	ICU Level of Service D
Analysis Period (min) 15	

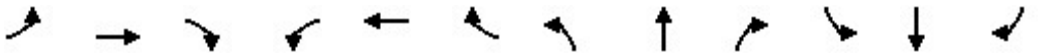
Splits and Phases: 5: Milliken Avenue & 4th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	220	572	243	694	1773	590	299	1405	219	298	1373
v/c Ratio	1.00	0.55	0.49	0.91	0.92	0.76	0.92	0.91	0.25	0.92	0.89
Control Delay	103.6	34.5	9.8	50.7	35.3	19.9	75.4	43.2	7.8	74.8	40.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.6	34.5	9.8	50.7	35.3	19.9	75.4	43.2	7.8	74.8	40.9
Queue Length 50th (ft)	65	108	11	196	344	154	88	226	39	88	215
Queue Length 95th (ft)	#139	145	74	#296	#446	297	#165	#293	77	#164	#278
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	221	1044	499	778	1937	775	324	1545	895	324	1542
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.55	0.49	0.89	0.92	0.76	0.92	0.91	0.24	0.92	0.89

Intersection Summary

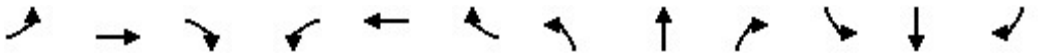
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	532	226	645	1649	549	278	1307	204	277	1144	133
Future Volume (veh/h)	205	532	226	645	1649	549	278	1307	204	277	1144	133
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	220	572	243	694	1773	590	299	1405	219	298	1230	143
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	224	1066	331	758	1948	605	327	1546	769	327	1416	164
Arrive On Green	0.07	0.21	0.21	0.25	0.38	0.38	0.11	0.24	0.24	0.11	0.24	0.24
Sat Flow, veh/h	3092	5106	1585	3092	5106	1585	3092	6434	1585	3092	5891	682
Grp Volume(v), veh/h	220	572	243	694	1773	590	299	1405	219	298	1006	367
Grp Sat Flow(s),veh/h/ln	1546	1702	1585	1546	1702	1585	1546	1609	1585	1546	1609	1748
Q Serve(g_s), s	6.4	9.0	12.9	19.6	29.6	33.0	8.6	19.1	7.4	8.6	18.0	18.1
Cycle Q Clear(g_c), s	6.4	9.0	12.9	19.6	29.6	33.0	8.6	19.1	7.4	8.6	18.0	18.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.39
Lane Grp Cap(c), veh/h	224	1066	331	758	1948	605	327	1546	769	327	1160	420
V/C Ratio(X)	0.98	0.54	0.73	0.92	0.91	0.98	0.92	0.91	0.28	0.91	0.87	0.87
Avail Cap(c_a), veh/h	224	1066	331	784	1948	605	327	1553	771	327	1165	422
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.7	31.7	33.2	33.0	26.3	27.4	39.8	33.2	13.8	39.8	32.8	32.8
Incr Delay (d2), s/veh	55.5	0.5	8.2	15.1	6.9	30.4	29.2	8.2	0.2	28.6	7.2	17.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	3.7	5.6	8.7	12.6	16.9	4.5	8.1	2.6	4.5	7.6	9.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	97.2	32.2	41.5	48.2	33.2	57.8	69.0	41.4	14.0	68.4	39.9	50.7
LnGrp LOS	F	C	D	D	C	E	E	D	B	E	D	D
Approach Vol, veh/h		1035			3057			1923			1671	
Approach Delay, s/veh		48.2			41.4			42.6			47.4	
Approach LOS		D			D			D			D	

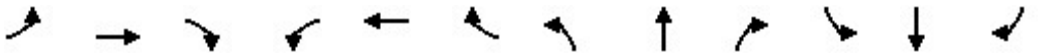
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	26.1	26.5	23.3	14.0	26.1	11.0	38.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	21.7	22.8	18.0	9.5	21.7	6.5	34.3
Max Q Clear Time (g_c+I1), s	10.6	21.1	21.6	14.9	10.6	20.1	8.4	35.0
Green Ext Time (p_c), s	0.0	0.5	0.4	1.4	0.0	1.2	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	43.9
HCM 6th LOS	D



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1800	1900	1900	1800	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.901	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	5085	1583	3072	5085	1583	1676	3539	1583	1676	3055	1441
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	5085	1583	3072	5085	1583	1676	3539	1583	1676	3055	1441
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136			136			136		208	208
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



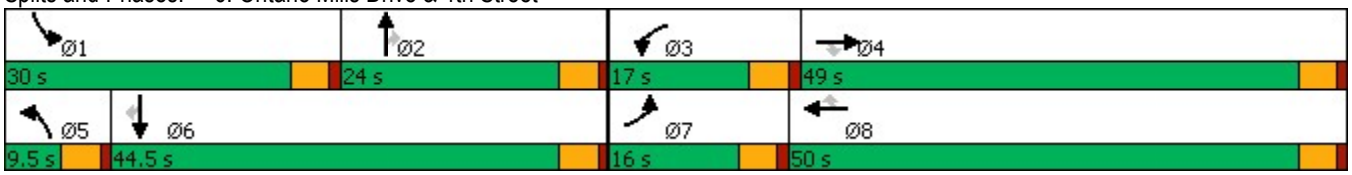
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	401	469	83	154	1811	184	101	99	109	205	312	1212
Future Volume (vph)	401	469	83	154	1811	184	101	99	109	205	312	1212
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	461	539	95	177	2082	211	116	114	125	236	359	1393
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	461	539	95	177	2082	211	116	114	125	236	1056	696

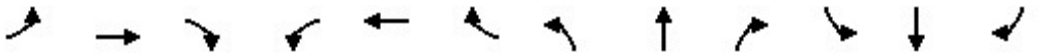
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	401	469	83	154	1811	184	101	99	109	205	312	1212
Future Volume (vph)	401	469	83	154	1811	184	101	99	109	205	312	1212
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	16.0	49.0	49.0	17.0	50.0	50.0	9.5	24.0	24.0	30.0	44.5	44.5
Total Split (%)	13.3%	40.8%	40.8%	14.2%	41.7%	41.7%	7.9%	20.0%	20.0%	25.0%	37.1%	37.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	11.5	45.7	45.7	11.3	45.5	45.5	5.0	23.8	23.8	21.2	40.0	40.0
Actuated g/C Ratio	0.10	0.38	0.38	0.09	0.38	0.38	0.04	0.20	0.20	0.18	0.33	0.33
v/c Ratio	1.57	0.28	0.14	0.61	1.08	0.31	1.68	0.16	0.30	0.80	1.09dr	1.12
Control Delay	307.4	26.5	1.8	61.4	81.9	10.8	396.0	42.2	8.0	66.7	43.4	102.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	307.4	26.5	1.8	61.4	81.9	10.8	396.0	42.2	8.0	66.7	43.4	102.6
LOS	F	C	A	E	F	B	F	D	A	E	D	F
Approach Delay		142.6			74.4			145.8			66.9	
Approach LOS		F			E			F			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.68	
Intersection Signal Delay: 88.8	Intersection LOS: F
Intersection Capacity Utilization 102.2%	ICU Level of Service G
Analysis Period (min) 15	
dr Defacto Right Lane. Recode with 1 though lane as a right lane.	

Splits and Phases: 6: Ontario Mills Drive & 4th Street





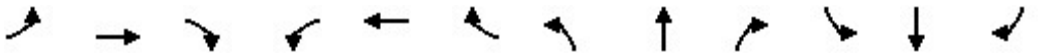
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	461	539	95	177	2082	211	116	114	125	236	1056	696
v/c Ratio	1.57	0.28	0.14	0.61	1.08	0.31	1.68	0.16	0.30	0.80	1.09dr	1.12
Control Delay	307.4	26.5	1.8	61.4	81.9	10.8	396.0	42.2	8.0	66.7	43.4	102.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	307.4	26.5	1.8	61.4	81.9	10.8	396.0	42.2	8.0	66.7	43.4	102.6
Queue Length 50th (ft)	~260	106	0	68	~660	38	~131	38	0	175	358	~560
Queue Length 95th (ft)	#350	131	11	102	#711	88	#242	66	42	248	#448	#770
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	294	1935	686	320	1928	684	69	701	423	356	1157	619
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.57	0.28	0.14	0.55	1.08	0.31	1.68	0.16	0.30	0.66	0.91	1.12

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



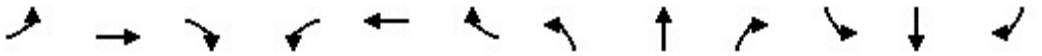
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	401	469	83	154	1811	184	101	99	109	205	312	1212
Future Volume (veh/h)	401	469	83	154	1811	184	101	99	109	205	312	1212
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1772	1870	1870	1772	1870	1870
Adj Flow Rate, veh/h	461	539	95	177	2082	211	116	114	125	236	359	1393
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	296	2047	635	229	1936	601	70	775	346	265	623	1057
Arrive On Green	0.10	0.40	0.40	0.07	0.38	0.38	0.04	0.22	0.22	0.16	0.33	0.33
Sat Flow, veh/h	3092	5106	1585	3092	5106	1585	1688	3554	1585	1688	1870	3170
Grp Volume(v), veh/h	461	539	95	177	2082	211	116	114	125	236	359	1393
Grp Sat Flow(s),veh/h/ln	1546	1702	1585	1546	1702	1585	1688	1777	1585	1688	1870	1585
Q Serve(g_s), s	11.5	8.5	4.6	6.7	45.5	11.4	5.0	3.1	8.0	16.4	19.0	40.0
Cycle Q Clear(g_c), s	11.5	8.5	4.6	6.7	45.5	11.4	5.0	3.1	8.0	16.4	19.0	40.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	296	2047	635	229	1936	601	70	775	346	265	623	1057
V/C Ratio(X)	1.56	0.26	0.15	0.77	1.08	0.35	1.65	0.15	0.36	0.89	0.58	1.32
Avail Cap(c_a), veh/h	296	2047	635	322	1936	601	70	775	346	359	623	1057
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.2	24.1	22.9	54.5	37.2	26.7	57.5	37.9	39.8	49.6	33.0	40.0
Incr Delay (d2), s/veh	266.1	0.1	0.1	7.3	44.1	0.3	347.1	0.1	0.6	18.7	1.3	150.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.4	3.4	1.7	2.9	26.4	4.4	8.9	1.4	3.2	8.3	8.8	37.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	320.3	24.2	23.0	61.8	81.4	27.0	404.6	38.0	40.5	68.3	34.3	190.0
LnGrp LOS	F	C	C	E	F	C	F	D	D	E	C	F
Approach Vol, veh/h		1095			2470			355			1988	
Approach Delay, s/veh		148.8			75.3			158.7			147.4	
Approach LOS		F			E			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.3	30.7	13.4	52.6	9.5	44.5	16.0	50.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	25.5	19.5	12.5	44.5	5.0	40.0	11.5	45.5
Max Q Clear Time (g_c+I1), s	18.4	10.0	8.7	10.5	7.0	42.0	13.5	47.5
Green Ext Time (p_c), s	0.4	0.7	0.2	4.4	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	118.2
HCM 6th LOS	F

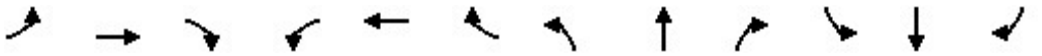
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.982			0.892				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.966	
Satd. Flow (prot)	3072	5085	1583	1676	4994	0	1676	3157	0	1593	1709	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.966	
Satd. Flow (perm)	3072	5085	1583	1676	4994	0	1676	3157	0	1593	1709	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127		24			84				353
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



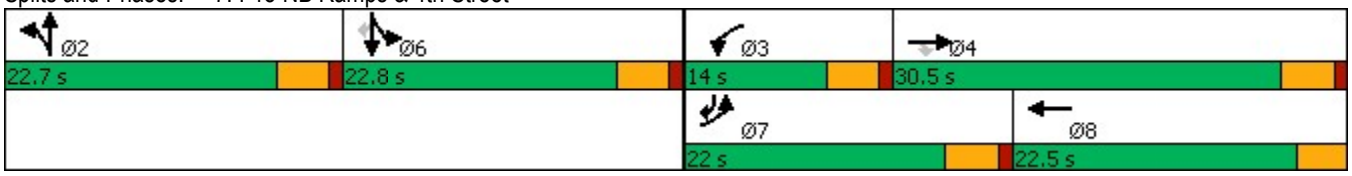
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	273	457	108	63	656	87	154	31	80	519	92	1346
Future Volume (vph)	273	457	108	63	656	87	154	31	80	519	92	1346
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	287	481	114	66	691	92	162	33	84	546	97	1417
Shared Lane Traffic (%)										42%		
Lane Group Flow (vph)	287	481	114	66	783	0	162	117	0	317	326	1417

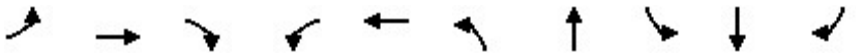
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	273	457	108	63	656	154	31	519	92	1346
Future Volume (vph)	273	457	108	63	656	154	31	519	92	1346
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	22.0	30.5	30.5	14.0	22.5	22.7	22.7	22.8	22.8	22.0
Total Split (%)	24.4%	33.9%	33.9%	15.6%	25.0%	25.2%	25.2%	25.3%	25.3%	24.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	17.6	28.5	28.5	8.0	17.7	13.1	13.1	18.4	18.4	40.5
Actuated g/C Ratio	0.21	0.34	0.34	0.10	0.21	0.16	0.16	0.22	0.22	0.48
v/c Ratio	0.45	0.28	0.18	0.41	0.73	0.62	0.21	0.91	0.87	0.97
Control Delay	32.6	22.4	4.7	44.9	34.7	43.9	12.5	65.3	58.1	36.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	22.4	4.7	44.9	34.7	43.9	12.5	65.3	58.1	36.1
LOS	C	C	A	D	C	D	B	E	E	D
Approach Delay		23.4			35.5		30.7		44.1	
Approach LOS		C			D		C		D	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 83.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 36.9	Intersection LOS: D
Intersection Capacity Utilization 84.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street

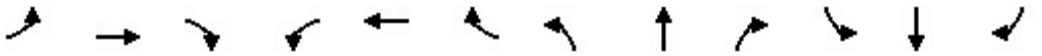




Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	287	481	114	66	783	162	117	317	326	1417
v/c Ratio	0.45	0.28	0.18	0.41	0.73	0.62	0.21	0.91	0.87	0.97
Control Delay	32.6	22.4	4.7	44.9	34.7	43.9	12.5	65.3	58.1	36.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	22.4	4.7	44.9	34.7	43.9	12.5	65.3	58.1	36.1
Queue Length 50th (ft)	70	71	0	34	137	82	7	175	178	334
Queue Length 95th (ft)	114	107	32	77	193	144	30	#365	#364	#572
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	643	1727	621	190	1154	365	753	349	374	1456
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.28	0.18	0.35	0.68	0.44	0.16	0.91	0.87	0.97

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	273	457	108	63	656	87	154	31	80	519	92	1346
Future Volume (veh/h)	273	457	108	63	656	87	154	31	80	519	92	1346
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1772	1870	1870	1772	1870	1870	1772	1870	1772
Adj Flow Rate, veh/h	287	481	114	66	691	92	162	33	84	615	0	1417
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	395	1475	458	88	974	128	224	235	210	896	0	1180
Arrive On Green	0.13	0.29	0.29	0.05	0.21	0.21	0.13	0.13	0.13	0.27	0.00	0.27
Sat Flow, veh/h	3092	5106	1585	1688	4564	602	1688	1777	1585	3375	0	3003
Grp Volume(v), veh/h	287	481	114	66	514	269	162	33	84	615	0	1417
Grp Sat Flow(s),veh/h/ln	1546	1702	1585	1688	1702	1762	1688	1777	1585	1688	0	1502
Q Serve(g_s), s	6.2	5.1	3.8	2.7	9.6	9.8	6.4	1.1	3.3	11.3	0.0	18.3
Cycle Q Clear(g_c), s	6.2	5.1	3.8	2.7	9.6	9.8	6.4	1.1	3.3	11.3	0.0	18.3
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	395	1475	458	88	726	376	224	235	210	896	0	1180
V/C Ratio(X)	0.73	0.33	0.25	0.75	0.71	0.72	0.72	0.14	0.40	0.69	0.00	1.20
Avail Cap(c_a), veh/h	785	1926	598	233	938	486	446	469	418	896	0	1180
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.9	19.2	18.8	32.2	25.1	25.2	28.7	26.4	27.4	22.7	0.0	20.9
Incr Delay (d2), s/veh	2.6	0.1	0.3	12.1	1.7	3.5	4.4	0.3	1.2	2.2	0.0	98.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	1.9	1.4	1.3	3.9	4.2	2.7	0.5	1.3	4.5	0.0	24.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.5	19.4	19.1	44.3	26.8	28.7	33.1	26.7	28.6	24.9	0.0	119.4
LnGrp LOS	C	B	B	D	C	C	C	C	C	C	A	F
Approach Vol, veh/h		882			849			279			2032	
Approach Delay, s/veh		23.3			28.8			31.0			90.8	
Approach LOS		C			C			C			F	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		13.6	8.1	24.4		22.8	13.3	19.2				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		18.2	9.5	26.0		18.3	17.5	* 19				
Max Q Clear Time (g_c+I1), s		8.4	4.7	7.1		20.3	8.2	11.8				
Green Ext Time (p_c), s		0.8	0.0	3.5		0.0	0.7	2.9				

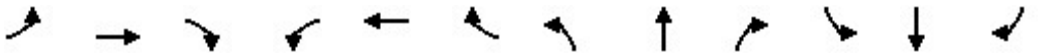
Intersection Summary		
HCM 6th Ctrl Delay	58.9	
HCM 6th LOS	E	

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
User approved changes to right turn type.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1600	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.903				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3196	0	4202	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3196	0	4202	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		127				182			182			182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



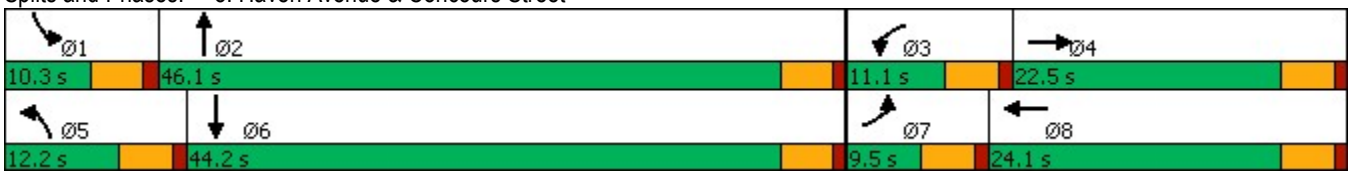
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	29	63	114	229	83	25	99	2530	191	139	1926	61
Future Volume (vph)	29	63	114	229	83	25	99	2530	191	139	1926	61
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	32	70	127	254	92	28	110	2811	212	154	2140	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	197	0	254	92	28	110	2811	212	154	2140	68

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	29	63	229	83	25	99	2530	191	139	1926	61
Future Volume (vph)	29	63	229	83	25	99	2530	191	139	1926	61
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	11.1	24.1		12.2	46.1		10.3	44.2	
Total Split (%)	10.6%	25.0%	12.3%	26.8%		13.6%	51.2%		11.4%	49.1%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.0	7.4	6.6	14.8	79.5	7.3	41.6	79.5	5.8	42.3	79.5
Actuated g/C Ratio	0.06	0.09	0.08	0.19	1.00	0.09	0.52	1.00	0.07	0.53	1.00
v/c Ratio	0.17	0.48	0.73	0.14	0.02	0.39	0.84	0.13	0.69	0.63	0.04
Control Delay	38.1	17.5	49.5	29.6	0.0	38.6	19.2	0.2	53.8	15.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.1	17.5	49.5	29.6	0.0	38.6	19.2	0.2	53.8	15.0	0.0
LOS	D	B	D	C	A	D	B	A	D	B	A
Approach Delay		20.4		40.9			18.6			17.1	
Approach LOS		C		D			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 79.5	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 19.5	Intersection LOS: B
Intersection Capacity Utilization 66.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	32	197	254	92	28	110	2811	212	154	2140	68
v/c Ratio	0.17	0.48	0.73	0.14	0.02	0.39	0.84	0.13	0.69	0.63	0.04
Control Delay	38.1	17.5	49.5	29.6	0.0	38.6	19.2	0.2	53.8	15.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.1	17.5	49.5	29.6	0.0	38.6	19.2	0.2	53.8	15.0	0.0
Queue Length 50th (ft)	7	17	44	18	0	26	319	0	39	217	0
Queue Length 95th (ft)	22	47	#82	43	0	53	406	0	#85	279	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	193	822	349	873	1583	297	3356	1583	224	3411	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.24	0.73	0.11	0.02	0.37	0.84	0.13	0.69	0.63	0.04

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

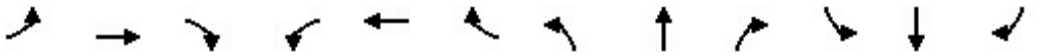
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	63	114	229	83	25	99	2530	191	139	1926	61
Future Volume (veh/h)	29	63	114	229	83	25	99	2530	191	139	1926	61
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1575	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	32	70	127	254	92	0	110	2811	0	154	2140	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	98	197	176	347	574		176	3294		220	3387	
Arrive On Green	0.03	0.11	0.11	0.08	0.16	0.00	0.06	0.51	0.00	0.07	0.53	0.00
Sat Flow, veh/h	3092	1777	1585	4230	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	32	70	127	254	92	0	110	2811	0	154	2140	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1410	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	0.8	2.9	6.2	4.7	1.8	0.0	2.8	30.5	0.0	3.9	19.0	0.0
Cycle Q Clear(g_c), s	0.8	2.9	6.2	4.7	1.8	0.0	2.8	30.5	0.0	3.9	19.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	98	197	176	347	574		176	3294		220	3387	
V/C Ratio(X)	0.33	0.35	0.72	0.73	0.16		0.63	0.85		0.70	0.63	
Avail Cap(c_a), veh/h	192	397	354	347	865		296	3326		223	3387	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.1	33.1	34.6	36.1	29.1	0.0	37.1	17.0	0.0	36.5	13.5	0.0
Incr Delay (d2), s/veh	1.9	1.1	5.5	7.7	0.1	0.0	3.6	2.3	0.0	9.2	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.3	2.6	1.8	0.8	0.0	1.1	10.5	0.0	1.7	6.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.0	34.2	40.0	43.8	29.2	0.0	40.8	19.3	0.0	45.7	13.9	0.0
LnGrp LOS	D	C	D	D	C		D	B		D	B	
Approach Vol, veh/h		229			346	A		2921	A		2294	A
Approach Delay, s/veh		38.2			39.9			20.1			16.0	
Approach LOS		D			D			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	45.7	11.1	13.4	9.1	46.9	7.1	17.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.8	41.6	6.6	18.0	7.7	39.7	5.0	19.6
Max Q Clear Time (g_c+I1), s	5.9	32.5	6.7	8.2	4.8	21.0	2.8	3.8
Green Ext Time (p_c), s	0.0	8.7	0.0	0.7	0.1	14.8	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	20.4
HCM 6th LOS	C

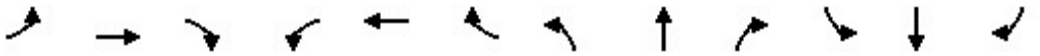
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1900	1900	1900	1900	1800	1900	1900	1800	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.850			0.977			0.994			0.989	
Flt Protected	0.950				0.968		0.950			0.950		
Satd. Flow (prot)	1593	1504	0	0	1762	0	1676	5055	0	1676	5029	0
Flt Permitted	0.950						0.950			0.950		
Satd. Flow (perm)	1593	1504	0	0	1820	0	1676	5055	0	1676	5029	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		563			1			7			16	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



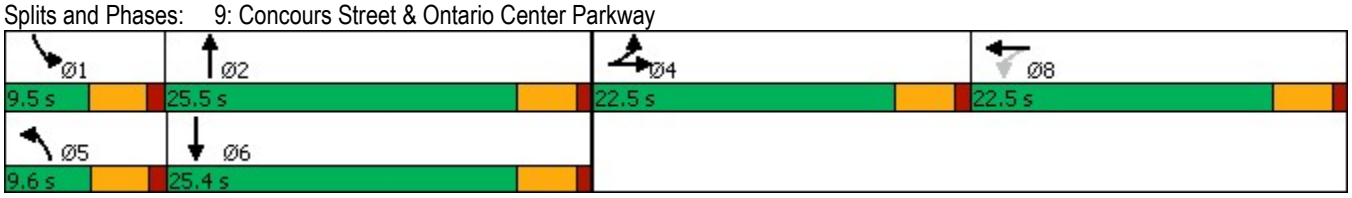
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	2	0	4	4	1	1	54	693	29	1	956	79
Future Volume (vph)	2	0	4	4	1	1	54	693	29	1	956	79
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	2	0	4	4	1	1	60	770	32	1	1062	88
Shared Lane Traffic (%)	10%											
Lane Group Flow (vph)	2	4	0	0	6	0	60	802	0	1	1150	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	2	0	4	1	54	693	1	956
Future Volume (vph)	2	0	4	1	54	693	1	956
Turn Type	Split	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	4	4		8	5	2	1	6
Permitted Phases			8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	9.6	25.5	9.5	25.4
Total Split (%)	28.1%	28.1%	28.1%	28.1%	12.0%	31.9%	11.9%	31.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.8	5.8		6.0	5.3	36.5	5.2	31.1
Actuated g/C Ratio	0.14	0.14		0.14	0.13	0.88	0.12	0.75
v/c Ratio	0.01	0.01		0.02	0.28	0.18	0.00	0.31
Control Delay	20.0	0.0		18.8	23.9	3.9	21.0	5.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	0.0		18.8	23.9	3.9	21.0	5.6
LOS	B	A		B	C	A	C	A
Approach Delay		6.7		18.8		5.3		5.6
Approach LOS		A		B		A		A

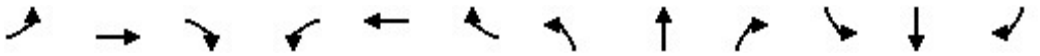
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 41.7	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.31	
Intersection Signal Delay: 5.5	Intersection LOS: A
Intersection Capacity Utilization 39.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	2	4	6	60	802	1	1150
v/c Ratio	0.01	0.01	0.02	0.28	0.18	0.00	0.31
Control Delay	20.0	0.0	18.8	23.9	3.9	21.0	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	0.0	18.8	23.9	3.9	21.0	5.6
Queue Length 50th (ft)	1	0	1	15	0	0	30
Queue Length 95th (ft)	6	0	10	50	98	4	147
Internal Link Dist (ft)		319	68		111		176
Turn Bay Length (ft)	170			115		120	
Base Capacity (vph)	720	988	823	214	4423	210	3752
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.00	0.01	0.28	0.18	0.00	0.31

Intersection Summary



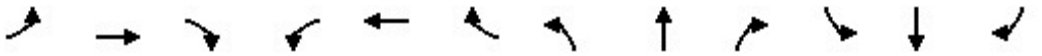
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	4	4	1	1	54	693	29	1	956	79
Future Volume (veh/h)	2	0	4	4	1	1	54	693	29	1	956	79
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1870	1870	1870	1870	1870	1772	1870	1870	1772	1870	1870
Adj Flow Rate, veh/h	2	0	4	4	1	1	60	770	32	1	1062	88
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	14	0	13	9	2	2	107	2352	97	5	1951	161
Arrive On Green	0.01	0.00	0.01	0.01	0.01	0.01	0.06	0.47	0.47	0.00	0.41	0.41
Sat Flow, veh/h	1688	0	1585	1173	293	293	1688	5029	208	1688	4805	398
Grp Volume(v), veh/h	2	0	4	6	0	0	60	521	281	1	752	398
Grp Sat Flow(s),veh/h/ln	1688	0	1585	1759	0	0	1688	1702	1833	1688	1702	1799
Q Serve(g_s), s	0.0	0.0	0.1	0.1	0.0	0.0	1.2	3.4	3.4	0.0	5.9	5.9
Cycle Q Clear(g_c), s	0.0	0.0	0.1	0.1	0.0	0.0	1.2	3.4	3.4	0.0	5.9	5.9
Prop In Lane	1.00		1.00	0.67		0.17	1.00		0.11	1.00		0.22
Lane Grp Cap(c), veh/h	14	0	13	14	0	0	107	1592	857	5	1382	730
V/C Ratio(X)	0.15	0.00	0.31	0.42	0.00	0.00	0.56	0.33	0.33	0.21	0.54	0.55
Avail Cap(c_a), veh/h	869	0	816	905	0	0	246	2044	1101	241	2034	1075
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.2	0.0	17.2	17.3	0.0	0.0	15.9	5.8	5.9	17.4	7.9	7.9
Incr Delay (d2), s/veh	4.8	0.0	13.2	18.6	0.0	0.0	4.6	0.1	0.2	20.0	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	0.1	0.0	0.0	0.5	0.7	0.8	0.0	1.5	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.0	0.0	30.4	35.8	0.0	0.0	20.5	6.0	6.1	37.4	8.3	8.6
LnGrp LOS	C	A	C	D	A	A	C	A	A	D	A	A
Approach Vol, veh/h		6			6			862			1151	
Approach Delay, s/veh		27.6			35.8			7.0			8.4	
Approach LOS		C			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.5	20.9		4.8	6.7	18.7		4.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	21.0		18.0	5.1	20.9		18.0				
Max Q Clear Time (g_c+I1), s	2.0	5.4		2.1	3.2	7.9		2.1				
Green Ext Time (p_c), s	0.0	4.7		0.0	0.0	6.3		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		7.9
HCM 6th LOS		A

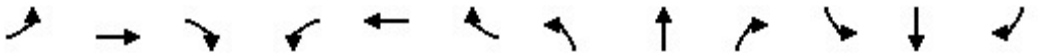
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			234			234			234			342
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



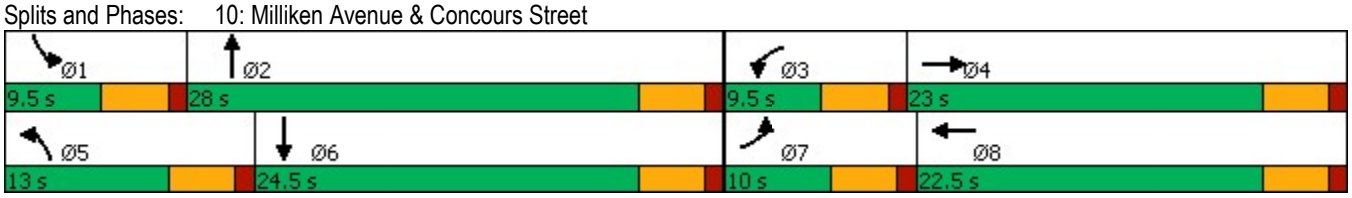
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	98	34	71	68	109	55	217	1314	83	103	1259	329
Future Volume (vph)	98	34	71	68	109	55	217	1314	83	103	1259	329
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	114	40	83	79	127	64	252	1528	97	120	1464	383
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	40	83	79	127	64	252	1528	97	120	1464	383

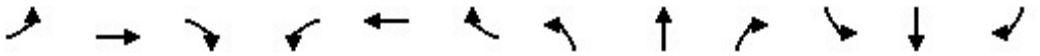
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	34	71	68	109	55	217	1314	83	103	1259	329
Future Volume (vph)	98	34	71	68	109	55	217	1314	83	103	1259	329
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	10.0	23.0		9.5	22.5		13.0	28.0		9.5	24.5	
Total Split (%)	14.3%	32.9%		13.6%	32.1%		18.6%	40.0%		13.6%	35.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	5.8	9.4	54.7	7.6	7.6	54.7	8.4	28.1	54.7	5.3	20.4	54.7
Actuated g/C Ratio	0.11	0.17	1.00	0.14	0.14	1.00	0.15	0.51	1.00	0.10	0.37	1.00
v/c Ratio	0.35	0.07	0.05	0.19	0.26	0.04	0.53	0.46	0.06	0.41	0.61	0.24
Control Delay	29.2	22.4	0.1	25.4	24.8	0.1	28.4	13.4	0.1	30.9	17.1	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.2	22.4	0.1	25.4	24.8	0.1	28.4	13.4	0.1	30.9	17.1	0.4
LOS	C	C	A	C	C	A	C	B	A	C	B	A
Approach Delay		17.9			19.1			14.7			14.7	
Approach LOS		B			B			B			B	

Intersection Summary		
Cycle Length: 70		
Actuated Cycle Length: 54.7		
Natural Cycle: 65		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.61		
Intersection Signal Delay: 15.1	Intersection LOS: B	
Intersection Capacity Utilization 46.2%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 10: Milliken Avenue & Concours Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	114	40	83	79	127	64	252	1528	97	120	1464	383
v/c Ratio	0.35	0.07	0.05	0.19	0.26	0.04	0.53	0.46	0.06	0.41	0.61	0.24
Control Delay	29.2	22.4	0.1	25.4	24.8	0.1	28.4	13.4	0.1	30.9	17.1	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.2	22.4	0.1	25.4	24.8	0.1	28.4	13.4	0.1	30.9	17.1	0.4
Queue Length 50th (ft)	20	6	0	10	22	0	44	121	0	21	128	0
Queue Length 95th (ft)	41	17	0	31	41	0	74	153	0	42	161	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	325	1262	1583	425	1228	1583	503	3291	1583	296	2470	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.03	0.05	0.19	0.10	0.04	0.50	0.46	0.06	0.41	0.59	0.24

Intersection Summary

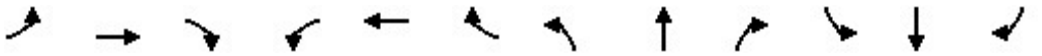
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	34	71	68	109	55	217	1314	83	103	1259	329
Future Volume (veh/h)	98	34	71	68	109	55	217	1314	83	103	1259	329
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	114	40	0	79	127	0	252	1528	0	120	1464	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	244	386		205	341		367	2494		249	2250	
Arrive On Green	0.08	0.11	0.00	0.07	0.10	0.00	0.12	0.39	0.00	0.08	0.35	0.00
Sat Flow, veh/h	3092	3554	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	114	40	0	79	127	0	252	1528	0	120	1464	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	1.8	0.5	0.0	1.2	1.7	0.0	3.9	9.6	0.0	1.9	9.7	0.0
Cycle Q Clear(g_c), s	1.8	0.5	0.0	1.2	1.7	0.0	3.9	9.6	0.0	1.9	9.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	244	386		205	341		367	2494		249	2250	
V/C Ratio(X)	0.47	0.10		0.39	0.37		0.69	0.61		0.48	0.65	
Avail Cap(c_a), veh/h	337	1303		306	1268		521	2996		306	2550	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.2	20.3	0.0	22.6	21.4	0.0	21.3	12.4	0.0	22.2	13.8	0.0
Incr Delay (d2), s/veh	1.4	0.1	0.0	1.2	0.7	0.0	2.3	0.3	0.0	1.4	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.2	0.0	0.4	0.7	0.0	1.4	2.9	0.0	0.7	3.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.6	20.4	0.0	23.8	22.1	0.0	23.6	12.7	0.0	23.6	14.3	0.0
LnGrp LOS	C	C		C	C		C	B		C	B	
Approach Vol, veh/h		154	A		206	A		1780	A		1584	A
Approach Delay, s/veh		22.8			22.7			14.2			15.0	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	24.1	7.8	10.0	10.5	22.1	8.5	9.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	23.5	5.0	18.5	8.5	20.0	5.5	18.0
Max Q Clear Time (g_c+I1), s	3.9	11.6	3.2	2.5	5.9	11.7	3.8	3.7
Green Ext Time (p_c), s	0.0	7.9	0.0	0.1	0.2	5.8	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	15.4
HCM 6th LOS	B

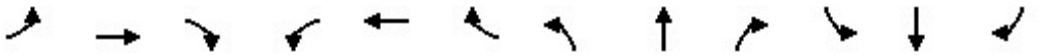
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1600	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3539	1583	4202	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3539	1583	4202	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			236			437			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



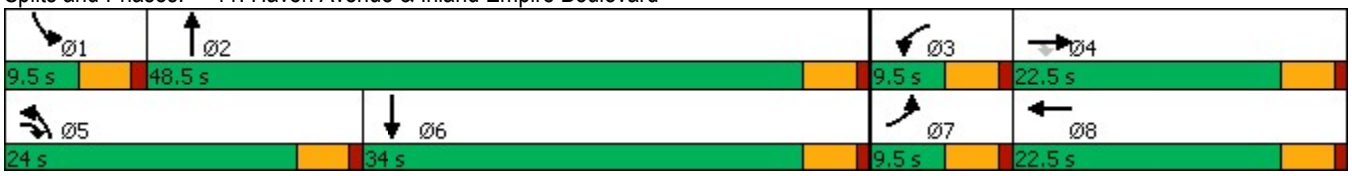
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	90	137	335	165	144	29	644	2912	906	73	1895	128
Future Volume (vph)	90	137	335	165	144	29	644	2912	906	73	1895	128
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	97	147	360	177	155	31	692	3131	974	78	2038	138
Shared Lane Traffic (%)												
Lane Group Flow (vph)	97	147	360	177	155	31	692	3131	974	78	2038	138

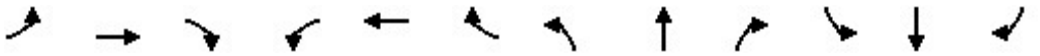
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	137	335	165	144	29	644	2912	906	73	1895	128
Future Volume (vph)	90	137	335	165	144	29	644	2912	906	73	1895	128
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	24.0	9.5	22.5		24.0	48.5		9.5	34.0	
Total Split (%)	10.6%	25.0%	26.7%	10.6%	25.0%		26.7%	53.9%		10.6%	37.8%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.0	8.9	32.9	5.0	10.8	80.9	19.5	46.0	80.9	5.0	29.5	80.9
Actuated g/C Ratio	0.06	0.11	0.41	0.06	0.13	1.00	0.24	0.57	1.00	0.06	0.36	1.00
v/c Ratio	0.51	0.38	0.52	0.68	0.33	0.02	0.93	0.86	0.62	0.41	0.87	0.09
Control Delay	47.2	36.3	17.3	52.3	34.9	0.0	52.4	19.1	1.8	44.0	29.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.2	36.3	17.3	52.3	34.9	0.0	52.4	19.1	1.8	44.0	29.5	0.1
LOS	D	D	B	D	C	A	D	B	A	D	C	A
Approach Delay		26.7			40.4			20.4			28.2	
Approach LOS		C			D			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 80.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 23.9	Intersection LOS: C
Intersection Capacity Utilization 71.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard

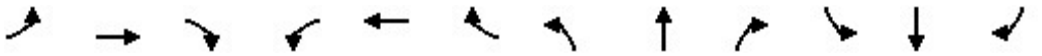




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	97	147	360	177	155	31	692	3131	974	78	2038	138
v/c Ratio	0.51	0.38	0.52	0.68	0.33	0.02	0.93	0.86	0.62	0.41	0.87	0.09
Control Delay	47.2	36.3	17.3	52.3	34.9	0.0	52.4	19.1	1.8	44.0	29.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.2	36.3	17.3	52.3	34.9	0.0	52.4	19.1	1.8	44.0	29.5	0.1
Queue Length 50th (ft)	25	36	105	31	38	0	177	382	0	20	273	0
Queue Length 95th (ft)	50	64	183	#63	67	0	#294	476	0	42	#340	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	189	787	686	259	787	1583	741	3642	1583	189	2338	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.19	0.52	0.68	0.20	0.02	0.93	0.86	0.62	0.41	0.87	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	137	335	165	144	29	644	2912	906	73	1895	128
Future Volume (veh/h)	90	137	335	165	144	29	644	2912	906	73	1895	128
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1575	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	97	147	360	177	155	0	692	3131	0	78	2038	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	157	697	656	236	715		673	3212		148	2119	
Arrive On Green	0.05	0.20	0.20	0.06	0.20	0.00	0.22	0.50	0.00	0.05	0.33	0.00
Sat Flow, veh/h	3092	3554	1585	4230	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	97	147	360	177	155	0	692	3131	0	78	2038	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1410	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	2.8	3.1	15.4	3.7	3.3	0.0	19.5	42.5	0.0	2.2	27.9	0.0
Cycle Q Clear(g_c), s	2.8	3.1	15.4	3.7	3.3	0.0	19.5	42.5	0.0	2.2	27.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	157	697	656	236	715		673	3212		148	2119	
V/C Ratio(X)	0.62	0.21	0.55	0.75	0.22		1.03	0.97		0.53	0.96	
Avail Cap(c_a), veh/h	173	714	664	236	715		673	3212		173	2119	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	41.7	30.2	19.9	41.7	29.9	0.0	35.0	21.9	0.0	41.7	29.5	0.0
Incr Delay (d2), s/veh	5.6	0.1	0.9	12.5	0.2	0.0	42.1	10.7	0.0	2.9	11.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	1.3	5.6	1.5	1.4	0.0	11.1	17.0	0.0	0.9	12.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.3	30.3	20.8	54.2	30.0	0.0	77.1	32.6	0.0	44.6	41.4	0.0
LnGrp LOS	D	C	C	D	C		F	C		D	D	
Approach Vol, veh/h		604			332	A		3823	A		2116	A
Approach Delay, s/veh		27.4			42.9			40.7			41.5	
Approach LOS		C			D			D			D	

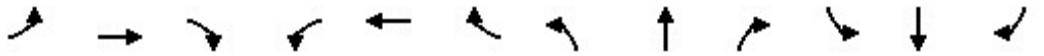
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.8	49.2	9.5	22.1	24.0	34.0	9.1	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	44.0	5.0	18.0	19.5	29.5	5.0	18.0
Max Q Clear Time (g_c+I1), s	4.2	44.5	5.7	17.4	21.5	29.9	4.8	5.3
Green Ext Time (p_c), s	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	39.9
HCM 6th LOS	D

Notes

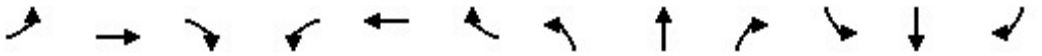
User approved changes to right turn type.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			236			236			236			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



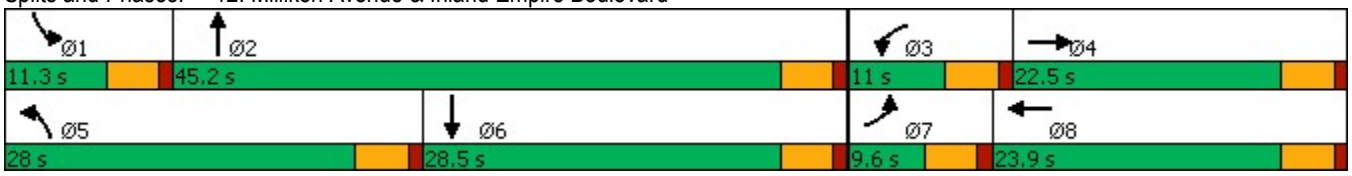
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	89	47	73	138	109	35	568	1470	154	82	1154	182
Future Volume (vph)	89	47	73	138	109	35	568	1470	154	82	1154	182
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	103	55	85	160	127	41	660	1709	179	95	1342	212
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	55	85	160	127	41	660	1709	179	95	1342	212

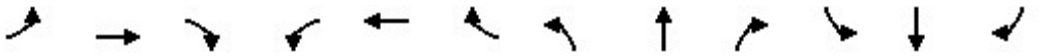
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	47	73	138	109	35	568	1470	154	82	1154	182
Future Volume (vph)	89	47	73	138	109	35	568	1470	154	82	1154	182
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.6	22.5		11.0	23.9		28.0	45.2		11.3	28.5	
Total Split (%)	10.7%	25.0%		12.2%	26.6%		31.1%	50.2%		12.6%	31.7%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	5.2	7.0	72.7	8.7	8.3	72.7	20.3	39.5	72.7	6.7	23.1	72.7
Actuated g/C Ratio	0.07	0.10	1.00	0.12	0.11	1.00	0.28	0.54	1.00	0.09	0.32	1.00
v/c Ratio	0.47	0.16	0.05	0.43	0.32	0.03	0.77	0.49	0.11	0.34	0.66	0.13
Control Delay	43.1	33.9	0.1	37.8	34.3	0.0	31.7	12.3	0.1	37.6	24.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.1	33.9	0.1	37.8	34.3	0.0	31.7	12.3	0.1	37.6	24.3	0.2
LOS	D	C	A	D	C	A	C	B	A	D	C	A
Approach Delay		26.0			31.7			16.5			22.0	
Approach LOS		C			C			B			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 72.7	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 19.9	Intersection LOS: B
Intersection Capacity Utilization 57.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	103	55	85	160	127	41	660	1709	179	95	1342	212
v/c Ratio	0.47	0.16	0.05	0.43	0.32	0.03	0.77	0.49	0.11	0.34	0.66	0.13
Control Delay	43.1	33.9	0.1	37.8	34.3	0.0	31.7	12.3	0.1	37.6	24.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.1	33.9	0.1	37.8	34.3	0.0	31.7	12.3	0.1	37.6	24.3	0.2
Queue Length 50th (ft)	25	13	0	39	30	0	148	151	0	22	161	0
Queue Length 95th (ft)	48	29	0	#73	54	0	202	180	0	44	200	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	220	899	1583	368	969	1583	1019	3682	1583	294	2171	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.06	0.05	0.43	0.13	0.03	0.65	0.46	0.11	0.32	0.62	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	47	73	138	109	35	568	1470	154	82	1154	182
Future Volume (veh/h)	89	47	73	138	109	35	568	1470	154	82	1154	182
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	103	55	0	160	127	0	660	1709	0	95	1342	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	201	272		239	316		801	3256		195	1996	
Arrive On Green	0.06	0.08	0.00	0.08	0.09	0.00	0.26	0.51	0.00	0.06	0.31	0.00
Sat Flow, veh/h	3092	3554	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	103	55	0	160	127	0	660	1709	0	95	1342	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	2.1	0.9	0.0	3.3	2.2	0.0	13.1	11.6	0.0	1.9	11.8	0.0
Cycle Q Clear(g_c), s	2.1	0.9	0.0	3.3	2.2	0.0	13.1	11.6	0.0	1.9	11.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	201	272		239	316		801	3256		195	1996	
V/C Ratio(X)	0.51	0.20		0.67	0.40		0.82	0.52		0.49	0.67	
Avail Cap(c_a), veh/h	243	984		309	1061		1118	4029		323	2376	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.4	28.2	0.0	29.2	28.0	0.0	22.7	10.8	0.0	29.4	19.5	0.0
Incr Delay (d2), s/veh	2.0	0.4	0.0	3.6	0.8	0.0	3.6	0.1	0.0	1.9	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.4	0.0	1.3	0.9	0.0	4.8	3.5	0.0	0.7	4.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.4	28.5	0.0	32.8	28.8	0.0	26.3	10.9	0.0	31.3	20.1	0.0
LnGrp LOS	C	C		C	C		C	B		C	C	
Approach Vol, veh/h		158	A		287	A		2369	A		1437	A
Approach Delay, s/veh		30.4			31.0			15.2			20.9	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	37.4	9.5	9.5	21.3	24.7	8.7	10.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.8	40.7	6.5	18.0	23.5	24.0	5.1	19.4
Max Q Clear Time (g_c+I1), s	3.9	13.6	5.3	2.9	15.1	13.8	4.1	4.2
Green Ext Time (p_c), s	0.1	15.6	0.1	0.2	1.8	6.4	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	18.8
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1800	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.943	0.850				
Flt Protected	0.970					
Satd. Flow (prot)	3132	1441	6408	0	0	6408
Flt Permitted	0.970					
Satd. Flow (perm)	3132	1441	6408	0	0	6408
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

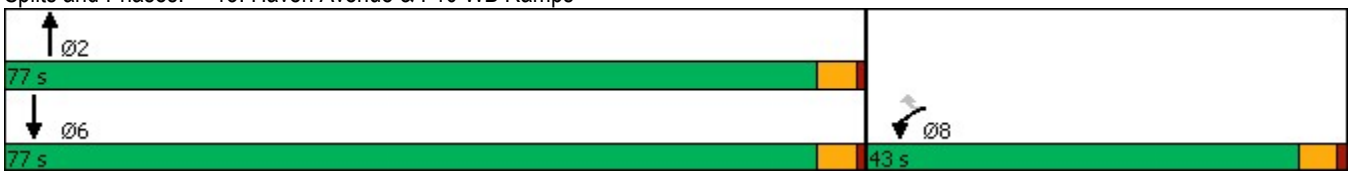
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	695	951	3646	0	0	2153
Future Volume (vph)	695	951	3646	0	0	2153
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	764	1045	4007	0	0	2366
Shared Lane Traffic (%)		45%				
Lane Group Flow (vph)	1234	575	4007	0	0	2366

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	695	951	3646	2153
Future Volume (vph)	695	951	3646	2153
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	43.0	43.0	77.0	77.0
Total Split (%)	35.8%	35.8%	64.2%	64.2%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	38.5	38.5	72.5	72.5
Actuated g/C Ratio	0.32	0.32	0.60	0.60
v/c Ratio	1.23	1.24	1.04	0.61
Control Delay	148.0	163.0	48.8	15.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	148.0	163.0	48.8	15.8
LOS	F	F	D	B
Approach Delay	152.8		48.8	15.8
Approach LOS	F		D	B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.24	
Intersection Signal Delay: 62.2	Intersection LOS: E
Intersection Capacity Utilization 103.1%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps



Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1234	575	4007	2366
v/c Ratio	1.23	1.24	1.04	0.61
Control Delay	148.0	163.0	48.8	15.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	148.0	163.0	48.8	15.8
Queue Length 50th (ft)	~607	~608	~970	314
Queue Length 95th (ft)	#742	#851	#1022	348
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	1004	462	3871	3871
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.23	1.24	1.04	0.61

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

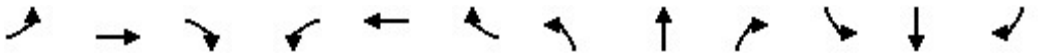
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	695	951	3646	0	0	2153
Future Volume (veh/h)	695	951	3646	0	0	2153
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1772	1870	1870	0	0	1870
Adj Flow Rate, veh/h	603	1217	4007	0	0	2366
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	541	1017	3887	0	0	3887
Arrive On Green	0.32	0.32	0.60	0.00	0.00	0.60
Sat Flow, veh/h	1688	3170	6958	0	0	6958
Grp Volume(v), veh/h	603	1217	4007	0	0	2366
Grp Sat Flow(s),veh/h/ln	1688	1585	1609	0	0	1609
Q Serve(g_s), s	38.5	38.5	72.5	0.0	0.0	27.6
Cycle Q Clear(g_c), s	38.5	38.5	72.5	0.0	0.0	27.6
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	541	1017	3887	0	0	3887
V/C Ratio(X)	1.11	1.20	1.03	0.00	0.00	0.61
Avail Cap(c_a), veh/h	541	1017	3887	0	0	3887
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	40.8	40.8	23.8	0.0	0.0	14.9
Incr Delay (d2), s/veh	73.8	98.2	23.1	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	26.8	28.6	31.5	0.0	0.0	9.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	114.5	138.9	46.9	0.0	0.0	15.1
LnGrp LOS	F	F	F	A	A	B
Approach Vol, veh/h	1820		4007			2366
Approach Delay, s/veh	130.8		46.9			15.1
Approach LOS	F		D			B

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	77.0			77.0	43.0
Change Period (Y+Rc), s	4.5			4.5	4.5
Max Green Setting (Gmax), s	72.5			72.5	38.5
Max Q Clear Time (g_c+I1), s	74.5			29.6	40.5
Green Ext Time (p_c), s	0.0			30.9	0.0

Intersection Summary	
HCM 6th Ctrl Delay	56.4
HCM 6th LOS	E

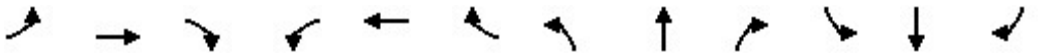
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	1863	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	1863	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			220			182			473			130
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



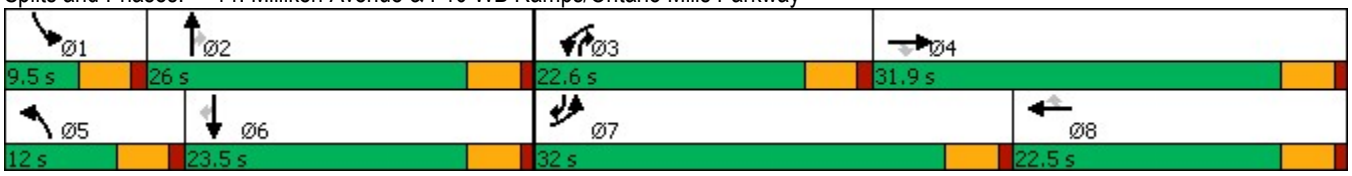
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	822	125	332	227	259	48	216	1251	421	117	765	354
Future Volume (vph)	822	125	332	227	259	48	216	1251	421	117	765	354
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	924	140	373	255	291	54	243	1406	473	131	860	398
Shared Lane Traffic (%)												
Lane Group Flow (vph)	924	140	373	255	291	54	243	1406	473	131	860	398

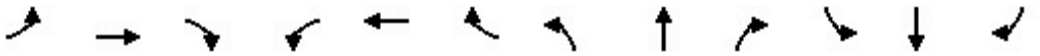
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	822	125	332	227	259	48	216	1251	421	117	765	354
Future Volume (vph)	822	125	332	227	259	48	216	1251	421	117	765	354
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	32.0	31.9	31.9	22.6	22.5	22.5	12.0	26.0	22.6	9.5	23.5	32.0
Total Split (%)	35.6%	35.4%	35.4%	25.1%	25.0%	25.0%	13.3%	28.9%	25.1%	10.6%	26.1%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	27.5	27.0	27.0	12.9	12.4	12.4	7.5	21.5	39.0	5.0	19.0	51.1
Actuated g/C Ratio	0.33	0.32	0.32	0.15	0.15	0.15	0.09	0.25	0.46	0.06	0.22	0.60
v/c Ratio	0.92	0.24	0.57	0.54	0.56	0.14	0.89	0.86	0.48	0.72	0.60	0.39
Control Delay	44.2	23.4	13.9	37.3	37.7	0.8	73.3	37.1	3.1	63.2	31.6	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.2	23.4	13.9	37.3	37.7	0.8	73.3	37.1	3.1	63.2	31.6	7.3
LOS	D	C	B	D	D	A	E	D	A	E	C	A
Approach Delay		34.3			34.2			33.7			27.6	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 84.5	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 32.4	Intersection LOS: C
Intersection Capacity Utilization 70.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	924	140	373	255	291	54	243	1406	473	131	860	398
v/c Ratio	0.92	0.24	0.57	0.54	0.56	0.14	0.89	0.86	0.48	0.72	0.60	0.39
Control Delay	44.2	23.4	13.9	37.3	37.7	0.8	73.3	37.1	3.1	63.2	31.6	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.2	23.4	13.9	37.3	37.7	0.8	73.3	37.1	3.1	63.2	31.6	7.3
Queue Length 50th (ft)	239	54	61	64	76	0	66	205	0	36	118	61
Queue Length 95th (ft)	#384	106	156	100	114	0	#141	#284	45	#83	160	130
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	1001	606	664	659	755	480	273	1633	1053	182	1443	1008
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.23	0.56	0.39	0.39	0.11	0.89	0.86	0.45	0.72	0.60	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	822	125	332	227	259	48	216	1251	421	117	765	354
Future Volume (veh/h)	822	125	332	227	259	48	216	1251	421	117	765	354
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	924	140	373	255	291	54	243	1406	473	131	860	398
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1006	625	529	346	428	191	289	1723	602	193	1523	891
Arrive On Green	0.33	0.33	0.33	0.11	0.12	0.12	0.09	0.27	0.27	0.06	0.24	0.24
Sat Flow, veh/h	3092	1870	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	924	140	373	255	291	54	243	1406	473	131	860	398
Grp Sat Flow(s),veh/h/ln	1546	1870	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	23.1	4.3	16.5	6.4	6.3	2.5	6.2	16.4	21.2	3.3	9.5	11.8
Cycle Q Clear(g_c), s	23.1	4.3	16.5	6.4	6.3	2.5	6.2	16.4	21.2	3.3	9.5	11.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1006	625	529	346	428	191	289	1723	602	193	1523	891
V/C Ratio(X)	0.92	0.22	0.70	0.74	0.68	0.28	0.84	0.82	0.79	0.68	0.56	0.45
Avail Cap(c_a), veh/h	1059	638	541	697	797	355	289	1723	602	193	1523	891
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.1	19.3	23.3	34.5	33.8	32.1	35.8	27.5	22.0	36.9	27.0	10.3
Incr Delay (d2), s/veh	12.2	0.2	4.0	3.1	1.9	0.8	19.5	3.2	6.8	9.3	0.5	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	1.8	6.4	2.5	2.8	1.0	3.1	6.4	8.5	1.5	3.6	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.2	19.4	27.3	37.6	35.7	32.9	55.3	30.7	28.8	46.2	27.5	10.6
LnGrp LOS	D	B	C	D	D	C	E	C	C	D	C	B
Approach Vol, veh/h		1437			600			2122			1389	
Approach Delay, s/veh		33.6			36.3			33.1			24.4	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	26.0	13.5	31.3	12.0	23.5	30.6	14.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	21.5	18.1	27.4	7.5	19.0	27.5	18.0
Max Q Clear Time (g_c+I1), s	5.3	23.2	8.4	18.5	8.2	13.8	25.1	8.3
Green Ext Time (p_c), s	0.0	0.0	0.6	1.5	0.0	3.2	1.0	1.4

Intersection Summary	
HCM 6th Ctrl Delay	31.4
HCM 6th LOS	C

Notes

User approved changes to right turn type.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.993	0.850				
Flt Protected	0.954					
Satd. Flow (prot)	3243	1441	0	6408	6408	0
Flt Permitted	0.954					
Satd. Flow (perm)	3243	1441	0	6408	6408	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

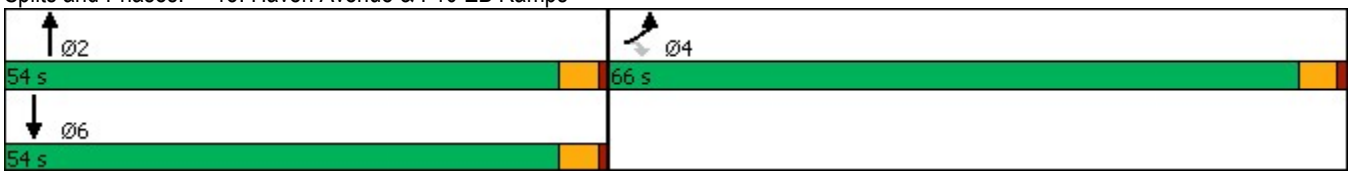
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	1734	816	0	2373	2137	0
Future Volume (vph)	1734	816	0	2373	2137	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1948	917	0	2666	2401	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	2040	825	0	2666	2401	0

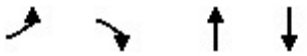
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1734	816	2373	2137
Future Volume (vph)	1734	816	2373	2137
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	66.0	66.0	54.0	54.0
Total Split (%)	55.0%	55.0%	45.0%	45.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	61.5	61.5	49.5	49.5
Actuated g/C Ratio	0.51	0.51	0.41	0.41
v/c Ratio	1.23	1.12	1.01	0.91
Control Delay	136.3	99.7	54.9	39.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	136.3	99.7	54.9	39.3
LOS	F	F	D	D
Approach Delay	125.8		54.9	39.3
Approach LOS	F		D	D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.23	
Intersection Signal Delay: 75.8	Intersection LOS: E
Intersection Capacity Utilization 103.1%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	2040	825	2666	2401
v/c Ratio	1.23	1.12	1.01	0.91
Control Delay	136.3	99.7	54.9	39.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	136.3	99.7	54.9	39.3
Queue Length 50th (ft)	~1004	~807	~603	500
Queue Length 95th (ft)	#1119	#1054	#686	543
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	1662	738	2643	2643
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.23	1.12	1.01	0.91

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1734	816	0	2373	2137	0
Future Volume (veh/h)	1734	816	0	2373	2137	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1772	1870	0	1870	1870	0
Adj Flow Rate, veh/h	1948	917	0	2666	2401	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	1730	812	0	2654	2654	0
Arrive On Green	0.51	0.51	0.00	0.41	0.41	0.00
Sat Flow, veh/h	3375	1585	0	6958	6958	0
Grp Volume(v), veh/h	1948	917	0	2666	2401	0
Grp Sat Flow(s),veh/h/ln	1688	1585	0	1609	1609	0
Q Serve(g_s), s	61.5	61.5	0.0	49.5	42.0	0.0
Cycle Q Clear(g_c), s	61.5	61.5	0.0	49.5	42.0	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	1730	812	0	2654	2654	0
V/C Ratio(X)	1.13	1.13	0.00	1.00	0.90	0.00
Avail Cap(c_a), veh/h	1730	812	0	2654	2654	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.3	29.3	0.0	35.3	33.0	0.0
Incr Delay (d2), s/veh	64.9	73.3	0.0	18.6	4.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	39.3	38.8	0.0	22.3	16.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	94.2	102.6	0.0	53.8	37.9	0.0
LnGrp LOS	F	F	A	F	D	A
Approach Vol, veh/h	2865			2666	2401	
Approach Delay, s/veh	96.9			53.8	37.9	
Approach LOS	F			D	D	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		54.0		66.0		54.0
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		49.5		61.5		49.5
Max Q Clear Time (g_c+I1), s		51.5		63.5		44.0
Green Ext Time (p_c), s		0.0		0.0		5.2

Intersection Summary		
HCM 6th Ctrl Delay	64.6	
HCM 6th LOS	E	

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1700	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3072	1583	3072	6408	6408	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3072	1583	3072	6408	6408	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						305
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	916	822	223	978	1018	383
Future Volume (vph)	916	822	223	978	1018	383
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1053	945	256	1124	1170	440
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1053	945	256	1124	1170	440

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	916	822	223	978	1018	383
Future Volume (vph)	916	822	223	978	1018	383
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	38.0	28.0	28.0	52.0	24.0	38.0
Total Split (%)	42.2%	31.1%	31.1%	57.8%	26.7%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	32.1	56.7	20.0	43.9	19.4	56.0
Actuated g/C Ratio	0.38	0.67	0.24	0.52	0.23	0.66
v/c Ratio	0.91	0.90	0.36	0.34	0.80	0.38
Control Delay	38.5	24.9	28.7	12.5	36.9	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	24.9	28.7	12.5	36.9	3.2
LOS	D	C	C	B	D	A
Approach Delay	32.1			15.5	27.7	
Approach LOS	C			B	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 85.1	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 26.1	Intersection LOS: C
Intersection Capacity Utilization 73.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	1053	945	256	1124	1170	440
v/c Ratio	0.91	0.90	0.36	0.34	0.80	0.38
Control Delay	38.5	24.9	28.7	12.5	36.9	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	24.9	28.7	12.5	36.9	3.2
Queue Length 50th (ft)	289	368	60	100	186	27
Queue Length 95th (ft)	#393	#601	90	118	218	59
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	1218	1122	855	3605	1480	1171
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.84	0.30	0.31	0.79	0.38

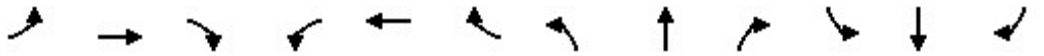
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	916	822	223	978	1018	383
Future Volume (veh/h)	916	822	223	978	1018	383
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1870	1673	1870	1870	1870
Adj Flow Rate, veh/h	1053	945	256	1124	1170	440
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1405	905	360	2725	1582	1110
Arrive On Green	0.45	0.45	0.12	0.42	0.25	0.25
Sat Flow, veh/h	3092	1585	3092	6696	6696	1585
Grp Volume(v), veh/h	1053	945	256	1124	1170	440
Grp Sat Flow(s),veh/h/ln	1546	1585	1546	1609	1609	1585
Q Serve(g_s), s	20.8	33.5	5.9	9.0	12.4	8.5
Cycle Q Clear(g_c), s	20.8	33.5	5.9	9.0	12.4	8.5
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1405	905	360	2725	1582	1110
V/C Ratio(X)	0.75	1.04	0.71	0.41	0.74	0.40
Avail Cap(c_a), veh/h	1405	905	986	4146	1702	1140
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.6	15.8	31.4	14.8	25.6	4.6
Incr Delay (d2), s/veh	2.3	42.1	2.6	0.1	1.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	10.6	2.3	3.0	4.7	7.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.9	57.9	34.0	14.9	27.2	4.8
LnGrp LOS	B	F	C	B	C	A
Approach Vol, veh/h	1998			1380	1610	
Approach Delay, s/veh	37.4			18.5	21.1	
Approach LOS	D			B	C	

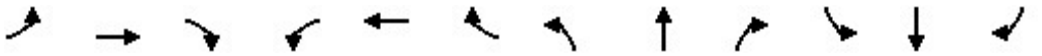
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		35.7		38.0	13.1	22.6
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		47.5		33.5	23.5	19.5
Max Q Clear Time (g_c+I1), s		11.0		35.5	7.9	14.4
Green Ext Time (p_c), s		10.2		0.0	0.8	3.8

Intersection Summary		
HCM 6th Ctrl Delay		26.9
HCM 6th LOS		C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.964				0.850			0.850		0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	4902	0	3072	3539	1583	3072	5085	1583	3072	6216	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	4902	0	3072	3539	1583	3072	5085	1583	3072	6216	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		65				136			177		65	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	510	961	303	200	823	143	353	2139	263	204	2057	519
Future Volume (vph)	510	961	303	200	823	143	353	2139	263	204	2057	519
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	554	1045	329	217	895	155	384	2325	286	222	2236	564
Shared Lane Traffic (%)												
Lane Group Flow (vph)	554	1374	0	217	895	155	384	2325	286	222	2800	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	510	961	200	823	143	353	2139	263	204	2057
Future Volume (vph)	510	961	200	823	143	353	2139	263	204	2057
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	22.0	37.0	14.0	29.0	29.0	14.0	57.0		12.0	55.0
Total Split (%)	18.3%	30.8%	11.7%	24.2%	24.2%	11.7%	47.5%		10.0%	45.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	17.5	32.5	9.5	24.5	24.5	9.5	52.5	120.0	7.5	50.5
Actuated g/C Ratio	0.15	0.27	0.08	0.20	0.20	0.08	0.44	1.00	0.06	0.42
v/c Ratio	1.24	1.00	0.89	1.24	0.36	1.58	1.05	0.18	1.16	1.06
Control Delay	167.3	65.9	90.6	159.9	11.7	316.0	65.7	0.3	162.5	67.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	167.3	65.9	90.6	159.9	11.7	316.0	65.7	0.3	162.5	67.8
LOS	F	E	F	F	B	F	E	A	F	E
Approach Delay		95.0		129.9			91.5			74.7
Approach LOS		F		F			F			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.58	
Intersection Signal Delay: 92.0	Intersection LOS: F
Intersection Capacity Utilization 103.8%	ICU Level of Service G
Analysis Period (min) 15	

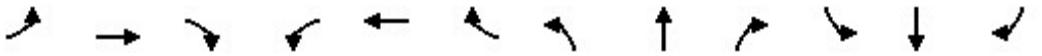
Splits and Phases: 1: Haven Avenue & 4th Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	554	1374	217	895	155	384	2325	286	222	2800
v/c Ratio	1.24	1.00	0.89	1.24	0.36	1.58	1.05	0.18	1.16	1.06
Control Delay	167.3	65.9	90.6	159.9	11.7	316.0	65.7	0.3	162.5	67.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	167.3	65.9	90.6	159.9	11.7	316.0	65.7	0.3	162.5	67.8
Queue Length 50th (ft)	~274	375	87	~452	12	~218	~716	0	~104	~682
Queue Length 95th (ft)	#386	#488	#160	#583	70	#318	#809	0	#186	#753
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	448	1375	243	722	431	243	2224	1583	192	2653
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.24	1.00	0.89	1.24	0.36	1.58	1.05	0.18	1.16	1.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



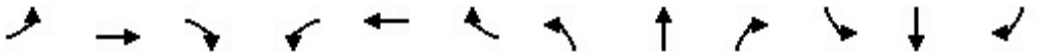
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	510	961	303	200	823	143	353	2139	263	204	2057	519
Future Volume (veh/h)	510	961	303	200	823	143	353	2139	263	204	2057	519
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	554	1045	329	217	895	155	384	2325	0	222	2236	564
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	451	1042	328	245	726	324	245	2234		193	2183	538
Arrive On Green	0.15	0.27	0.27	0.08	0.20	0.20	0.08	0.44	0.00	0.06	0.42	0.42
Sat Flow, veh/h	3092	3846	1210	3092	3554	1585	3092	5106	1585	3092	5186	1279
Grp Volume(v), veh/h	554	925	449	217	895	155	384	2325	0	222	2077	723
Grp Sat Flow(s),veh/h/ln	1546	1702	1652	1546	1777	1585	1546	1702	1585	1546	1609	1640
Q Serve(g_s), s	17.5	32.5	32.5	8.3	24.5	10.4	9.5	52.5	0.0	7.5	50.5	50.5
Cycle Q Clear(g_c), s	17.5	32.5	32.5	8.3	24.5	10.4	9.5	52.5	0.0	7.5	50.5	50.5
Prop In Lane	1.00		0.73	1.00		1.00	1.00		1.00	1.00		0.78
Lane Grp Cap(c), veh/h	451	922	448	245	726	324	245	2234		193	2031	690
V/C Ratio(X)	1.23	1.00	1.00	0.89	1.23	0.48	1.57	1.04		1.15	1.02	1.05
Avail Cap(c_a), veh/h	451	922	448	245	726	324	245	2234		193	2031	690
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.2	43.8	43.8	54.7	47.8	42.1	55.3	33.8	0.0	56.3	34.8	34.8
Incr Delay (d2), s/veh	121.1	30.4	43.4	29.8	116.9	1.1	274.8	30.7	0.0	110.5	26.0	47.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.3	17.4	18.5	4.3	22.6	4.2	13.0	27.3	0.0	5.9	24.1	28.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	172.4	74.2	87.2	84.5	164.6	43.2	330.1	64.4	0.0	166.8	60.7	82.1
LnGrp LOS	F	F	F	F	F	D	F	F		F	F	F
Approach Vol, veh/h		1928			1267			2709	A		3022	
Approach Delay, s/veh		105.4			136.1			102.1			73.6	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	57.0	14.0	37.0	14.0	55.0	22.0	29.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	52.5	9.5	32.5	9.5	50.5	17.5	24.5
Max Q Clear Time (g_c+I1), s	9.5	54.5	10.3	34.5	11.5	52.5	19.5	26.5
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	98.0
HCM 6th LOS	F

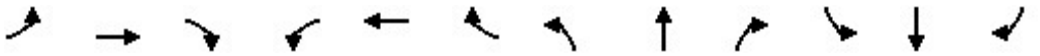
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt						0.850			0.850		0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	6408	0	1676	5085	1583	1676	1863	1583	1676	3008	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1676	6408	0	1676	5085	1583	1676	1863	1583	1676	3008	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				163			132		227	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	6	2522	7	1	1521	193	20	0	13	151	0	17
Future Volume (vph)	6	2522	7	1	1521	193	20	0	13	151	0	17
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	6	2655	7	1	1601	203	21	0	14	159	0	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	6	2662	0	1	1601	203	21	0	14	159	18	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	6	2522	1	1521	193	20	13	151	0
Future Volume (vph)	6	2522	1	1521	193	20	13	151	0
Turn Type	Prot	NA	Prot	NA	Perm	Prot	Perm	Prot	NA
Protected Phases	7	4	3	8		5		1	6
Permitted Phases					8		2		
Detector Phase	7	4	3	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.5	42.4	9.5	42.4	42.4	11.8	23.7	14.4	26.3
Total Split (%)	10.6%	47.1%	10.6%	47.1%	47.1%	13.1%	26.3%	16.0%	29.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.0	38.0	5.0	38.0	38.0	6.3	5.5	9.8	17.7
Actuated g/C Ratio	0.07	0.55	0.07	0.55	0.55	0.09	0.08	0.14	0.26
v/c Ratio	0.05	0.75	0.01	0.57	0.21	0.14	0.06	0.66	0.02
Control Delay	32.5	13.9	32.0	11.4	3.2	31.9	0.5	44.3	0.1
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Total Delay	32.5	13.9	32.0	11.6	3.2	31.9	0.5	44.3	0.1
LOS	C	B	C	B	A	C	A	D	A
Approach Delay		13.9		10.7					39.8
Approach LOS		B		B					D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 68.6	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 13.7	Intersection LOS: B
Intersection Capacity Utilization 60.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	6	2662	1	1601	203	21	14	159	18
v/c Ratio	0.05	0.75	0.01	0.57	0.21	0.14	0.06	0.66	0.02
Control Delay	32.5	13.9	32.0	11.4	3.2	31.9	0.5	44.3	0.1
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Total Delay	32.5	13.9	32.0	11.6	3.2	31.9	0.5	44.3	0.1
Queue Length 50th (ft)	2	210	0	136	7	8	0	62	0
Queue Length 95th (ft)	14	351	5	239	41	30	0	#163	0
Internal Link Dist (ft)		2546		362					358
Turn Bay Length (ft)	130		130		145	165	165	50	
Base Capacity (vph)	122	3550	122	2816	949	179	539	242	1113
Starvation Cap Reductn	0	0	0	397	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.75	0.01	0.66	0.21	0.12	0.03	0.66	0.02

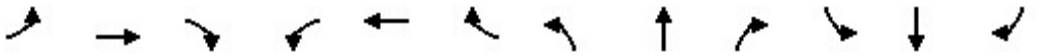
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	2522	7	1	1521	193	20	0	13	151	0	17
Future Volume (veh/h)	6	2522	7	1	1521	193	20	0	13	151	0	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1870	1870	1772	1870	1870	1772	1870	1870	1772	1870	1870
Adj Flow Rate, veh/h	6	2655	7	1	1601	203	21	0	14	159	0	18
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	13	3600	9	3	2721	845	41	139	118	196	296	264
Arrive On Green	0.01	0.54	0.54	0.00	0.53	0.53	0.02	0.00	0.07	0.12	0.00	0.17
Sat Flow, veh/h	1688	6675	18	1688	5106	1585	1688	1870	1585	1688	1777	1585
Grp Volume(v), veh/h	6	1919	743	1	1601	203	21	0	14	159	0	18
Grp Sat Flow(s),veh/h/ln	1688	1609	1867	1688	1702	1585	1688	1870	1585	1688	1777	1585
Q Serve(g_s), s	0.2	20.4	20.4	0.0	14.3	4.6	0.8	0.0	0.6	6.2	0.0	0.6
Cycle Q Clear(g_c), s	0.2	20.4	20.4	0.0	14.3	4.6	0.8	0.0	0.6	6.2	0.0	0.6
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	13	2603	1007	3	2721	845	41	139	118	196	296	264
V/C Ratio(X)	0.45	0.74	0.74	0.40	0.59	0.24	0.52	0.00	0.12	0.81	0.00	0.07
Avail Cap(c_a), veh/h	126	2726	1055	126	2885	896	184	535	454	249	577	515
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.1	11.8	11.8	33.5	10.7	8.4	32.3	0.0	29.0	28.9	0.0	23.6
Incr Delay (d2), s/veh	22.0	1.0	2.6	79.0	0.3	0.1	9.7	0.0	0.4	14.4	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	6.3	7.8	0.1	4.6	1.4	0.4	0.0	0.2	3.2	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.2	12.8	14.5	112.4	10.9	8.5	42.1	0.0	29.4	43.3	0.0	23.7
LnGrp LOS	E	B	B	F	B	A	D	A	C	D	A	C
Approach Vol, veh/h		2668			1805			35			177	
Approach Delay, s/veh		13.4			10.7			37.0			41.3	
Approach LOS		B			B			D			D	

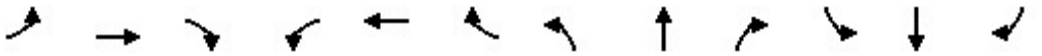
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.3	9.5	4.6	40.7	6.1	15.7	5.0	40.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.9	19.2	5.0	37.9	7.3	21.8	5.0	37.9
Max Q Clear Time (g_c+I1), s	8.2	2.6	2.0	22.4	2.8	2.6	2.2	16.3
Green Ext Time (p_c), s	0.1	0.0	0.0	13.8	0.0	0.0	0.0	13.3

Intersection Summary	
HCM 6th Ctrl Delay	13.6
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1800	1900	1900	1800	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.995				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.953	
Satd. Flow (prot)	3072	6401	0	1676	5060	0	1676	1863	1583	0	1775	1583
Flt Permitted	0.950			0.950			0.715				0.730	
Satd. Flow (perm)	3072	6401	0	1676	5060	0	1262	1863	1583	0	1360	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			10				152			94
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



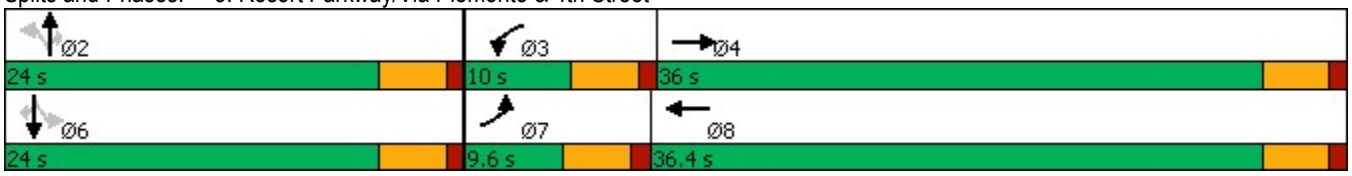
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	41	2545	12	7	1521	54	16	0	28	60	1	28
Future Volume (vph)	41	2545	12	7	1521	54	16	0	28	60	1	28
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	43	2679	13	7	1601	57	17	0	29	63	1	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	2692	0	7	1658	0	17	0	29	0	64	29

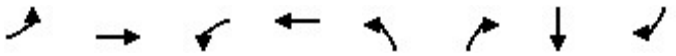
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	41	2545	7	1521	16	28	60	1	28
Future Volume (vph)	41	2545	7	1521	16	28	60	1	28
Turn Type	Prot	NA	Prot	NA	Perm	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8				6	
Permitted Phases					2	2	6		6
Detector Phase	7	4	3	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.6	36.0	10.0	36.4	24.0	24.0	24.0	24.0	24.0
Total Split (%)	13.7%	51.4%	14.3%	52.0%	34.3%	34.3%	34.3%	34.3%	34.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min
Act Effct Green (s)	5.2	33.8	5.6	32.2	7.9	7.9		7.9	7.9
Actuated g/C Ratio	0.10	0.64	0.11	0.61	0.15	0.15		0.15	0.15
v/c Ratio	0.14	0.65	0.04	0.53	0.09	0.08		0.31	0.09
Control Delay	25.7	7.8	25.3	7.8	22.0	0.4		25.6	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	25.7	7.8	25.3	7.8	22.0	0.4		25.6	0.6
LOS	C	A	C	A	C	A		C	A
Approach Delay		8.0		7.9				17.8	
Approach LOS		A		A				B	

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 52.6	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 8.2	Intersection LOS: A
Intersection Capacity Utilization 56.7%	ICU Level of Service B
Analysis Period (min) 15	

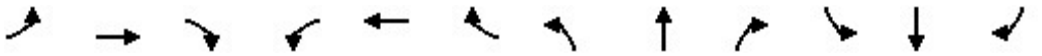
Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street





Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBT	SBR
Lane Group Flow (vph)	43	2692	7	1658	17	29	64	29
v/c Ratio	0.14	0.65	0.04	0.53	0.09	0.08	0.31	0.09
Control Delay	25.7	7.8	25.3	7.8	22.0	0.4	25.6	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	7.8	25.3	7.8	22.0	0.4	25.6	0.6
Queue Length 50th (ft)	5	102	2	67	4	0	16	0
Queue Length 95th (ft)	21	277	13	190	20	0	52	0
Internal Link Dist (ft)		362		428			378	
Turn Bay Length (ft)	220		125		115	115		110
Base Capacity (vph)	302	4116	177	3119	474	690	511	654
Starvation Cap Reductn	0	20	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.66	0.04	0.53	0.04	0.04	0.13	0.04

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	2545	12	7	1521	54	16	0	28	60	1	28
Future Volume (veh/h)	41	2545	12	7	1521	54	16	0	28	60	1	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1772	1870	1870	1772	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	43	2679	13	7	1601	57	17	0	29	63	1	29
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	140	4060	20	16	2904	103	226	193	163	287	3	163
Arrive On Green	0.05	0.61	0.61	0.01	0.57	0.57	0.10	0.00	0.10	0.10	0.10	0.10
Sat Flow, veh/h	3092	6658	32	1688	5062	180	1307	1870	1585	1356	33	1585
Grp Volume(v), veh/h	43	1941	751	7	1077	581	17	0	29	64	0	29
Grp Sat Flow(s),veh/h/ln	1546	1609	1865	1688	1702	1838	1307	1870	1585	1390	0	1585
Q Serve(g_s), s	0.7	12.8	12.8	0.2	9.6	9.6	0.6	0.0	0.8	2.1	0.0	0.8
Cycle Q Clear(g_c), s	0.7	12.8	12.8	0.2	9.6	9.6	2.7	0.0	0.8	2.1	0.0	0.8
Prop In Lane	1.00		0.02	1.00		0.10	1.00		1.00	0.98		1.00
Lane Grp Cap(c), veh/h	140	2943	1137	16	1953	1054	226	193	163	290	0	163
V/C Ratio(X)	0.31	0.66	0.66	0.45	0.55	0.55	0.08	0.00	0.18	0.22	0.00	0.18
Avail Cap(c_a), veh/h	325	3130	1209	191	2236	1207	617	751	636	704	0	636
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.4	6.2	6.2	23.9	6.5	6.5	21.7	0.0	19.9	20.5	0.0	19.9
Incr Delay (d2), s/veh	1.2	0.5	1.2	18.7	0.2	0.5	0.1	0.0	0.5	0.4	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.7	3.4	0.2	2.3	2.6	0.2	0.0	0.3	0.6	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.7	6.7	7.4	42.6	6.7	6.9	21.9	0.0	20.4	20.9	0.0	20.4
LnGrp LOS	C	A	A	D	A	A	C	A	C	C	A	C
Approach Vol, veh/h		2735			1665			46			93	
Approach Delay, s/veh		7.1			6.9			21.0			20.7	
Approach LOS		A			A			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	5.0	34.1		9.5	6.7	32.4				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		19.5	5.5	31.5		19.5	5.1	31.9				
Max Q Clear Time (g_c+I1), s		4.7	2.2	14.8		4.1	2.7	11.6				
Green Ext Time (p_c), s		0.1	0.0	14.8		0.3	0.0	12.1				

Intersection Summary	
HCM 6th Ctrl Delay	7.5
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.995					0.865
Flt Protected						
Satd. Flow (prot)	5060	0	0	5085	0	1611
Flt Permitted						
Satd. Flow (perm)	5060	0	0	5085	0	1611
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	2555	89	0	1544	0	38
Future Volume (vph)	2555	89	0	1544	0	38
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	2661	93	0	1608	0	40
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2754	0	0	1608	0	40

Intersection Summary

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2555	89	0	1544	0	38
Future Vol, veh/h	2555	89	0	1544	0	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2661	93	0	1608	0	40

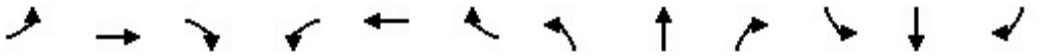
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1377
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	115
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	115
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	51.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	115	-	-	-
HCM Lane V/C Ratio	0.344	-	-	-
HCM Control Delay (s)	51.9	-	-	-
HCM Lane LOS	F	-	-	-
HCM 95th %tile Q(veh)	1.4	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.980	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	5085	1583	3072	5085	1583	3072	6408	1583	3072	6280	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	5085	1583	3072	5085	1583	3072	6408	1583	3072	6280	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			187			280			55		32	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



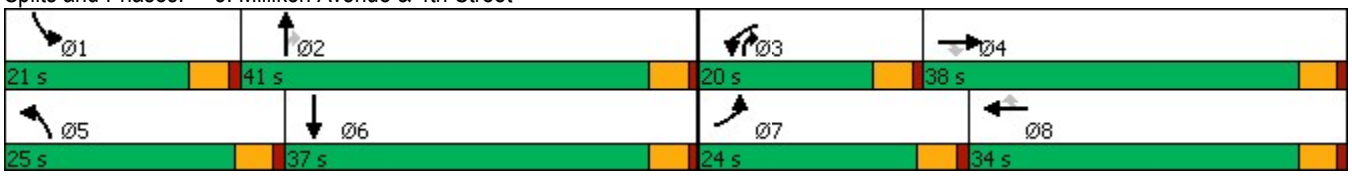
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	610	1501	288	516	1184	385	426	2083	511	605	1288	201
Future Volume (vph)	610	1501	288	516	1184	385	426	2083	511	605	1288	201
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	635	1564	300	538	1233	401	444	2170	532	630	1342	209
Shared Lane Traffic (%)												
Lane Group Flow (vph)	635	1564	300	538	1233	401	444	2170	532	630	1551	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	610	1501	288	516	1184	385	426	2083	511	605	1288
Future Volume (vph)	610	1501	288	516	1184	385	426	2083	511	605	1288
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	24.0	38.0	38.0	20.0	34.0	34.0	25.0	41.0	20.0	21.0	37.0
Total Split (%)	20.0%	31.7%	31.7%	16.7%	28.3%	28.3%	20.8%	34.2%	16.7%	17.5%	30.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	19.5	33.5	33.5	15.5	29.5	29.5	19.9	36.5	56.5	16.5	33.1
Actuated g/C Ratio	0.16	0.28	0.28	0.13	0.25	0.25	0.17	0.30	0.47	0.14	0.28
v/c Ratio	1.27	1.10	0.52	1.36	0.99	0.67	0.87	1.11	0.69	1.49	0.88
Control Delay	178.8	97.7	17.0	217.0	67.6	18.3	67.5	98.0	27.6	270.5	47.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	178.8	97.7	17.0	217.0	67.6	18.3	67.5	98.0	27.6	270.5	47.9
LOS	F	F	B	F	E	B	E	F	C	F	D
Approach Delay		108.6			95.5			81.8			112.2
Approach LOS		F			F			F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.49	
Intersection Signal Delay: 98.1	Intersection LOS: F
Intersection Capacity Utilization 109.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 5: Milliken Avenue & 4th Street

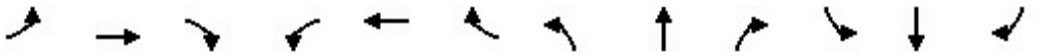


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	635	1564	300	538	1233	401	444	2170	532	630	1551
v/c Ratio	1.27	1.10	0.52	1.36	0.99	0.67	0.87	1.11	0.69	1.49	0.88
Control Delay	178.8	97.7	17.0	217.0	67.6	18.3	67.5	98.0	27.6	270.5	47.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	178.8	97.7	17.0	217.0	67.6	18.3	67.5	98.0	27.6	270.5	47.9
Queue Length 50th (ft)	~320	~504	68	~281	349	80	173	~560	284	~347	331
Queue Length 95th (ft)	#437	#601	158	#393	#453	196	#256	#635	418	#464	380
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	499	1419	576	396	1250	600	524	1949	774	422	1756
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.27	1.10	0.52	1.36	0.99	0.67	0.85	1.11	0.69	1.49	0.88

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

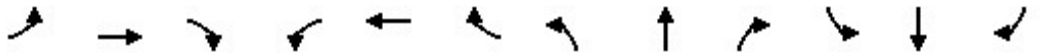
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	610	1501	288	516	1184	385	426	2083	511	605	1288	201
Future Volume (veh/h)	610	1501	288	516	1184	385	426	2083	511	605	1288	201
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	635	1564	300	538	1233	401	444	2170	532	630	1342	209
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	502	1425	442	399	1255	390	495	1957	687	425	1594	247
Arrive On Green	0.16	0.28	0.28	0.13	0.25	0.25	0.16	0.30	0.30	0.14	0.28	0.28
Sat Flow, veh/h	3092	5106	1585	3092	5106	1585	3092	6434	1585	3092	5659	879
Grp Volume(v), veh/h	635	1564	300	538	1233	401	444	2170	532	630	1144	407
Grp Sat Flow(s),veh/h/ln	1546	1702	1585	1546	1702	1585	1546	1609	1585	1546	1609	1712
Q Serve(g_s), s	19.5	33.5	20.2	15.5	28.8	29.5	16.9	36.5	34.4	16.5	26.8	26.9
Cycle Q Clear(g_c), s	19.5	33.5	20.2	15.5	28.8	29.5	16.9	36.5	34.4	16.5	26.8	26.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.51
Lane Grp Cap(c), veh/h	502	1425	442	399	1255	390	495	1957	687	425	1359	482
V/C Ratio(X)	1.26	1.10	0.68	1.35	0.98	1.03	0.90	1.11	0.77	1.48	0.84	0.84
Avail Cap(c_a), veh/h	502	1425	442	399	1255	390	528	1957	687	425	1359	482
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.3	43.3	38.5	52.3	45.0	45.2	49.4	41.8	29.0	51.8	40.6	40.6
Incr Delay (d2), s/veh	133.9	55.1	4.1	172.1	21.2	53.3	17.3	57.0	5.5	229.2	4.9	12.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.8	21.2	8.3	15.5	14.5	17.3	7.7	22.0	13.9	19.9	11.1	13.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	184.2	98.3	42.6	224.3	66.1	98.5	66.8	98.8	34.5	280.9	45.5	53.6
LnGrp LOS	F	F	D	F	E	F	E	F	C	F	D	D
Approach Vol, veh/h		2499			2172			3146			2181	
Approach Delay, s/veh		113.4			111.3			83.4			115.0	
Approach LOS		F			F			F			F	

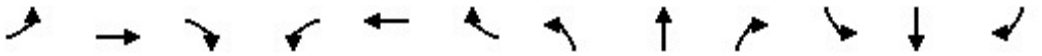
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	41.0	20.0	38.0	23.7	38.3	24.0	34.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	36.5	15.5	33.5	20.5	32.5	19.5	29.5
Max Q Clear Time (g_c+I1), s	18.5	38.5	17.5	35.5	18.9	28.9	21.5	31.5
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.3	2.8	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	103.9
HCM 6th LOS	F



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1800	1900	1900	1800	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.927	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	5085	1583	3072	5085	1583	1676	3539	1583	1676	3143	1441
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	5085	1583	3072	5085	1583	1676	3539	1583	1676	3143	1441
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			146			150			259		186	447
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



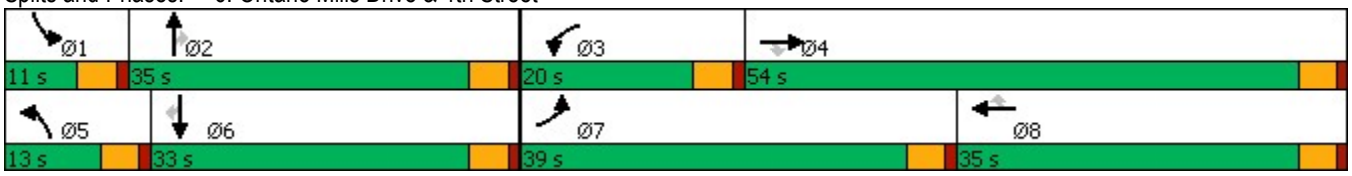
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1339	1699	168	316	1352	456	198	434	492	109	437	823
Future Volume (vph)	1339	1699	168	316	1352	456	198	434	492	109	437	823
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1455	1847	183	343	1470	496	215	472	535	118	475	895
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	1455	1847	183	343	1470	496	215	472	535	118	923	447

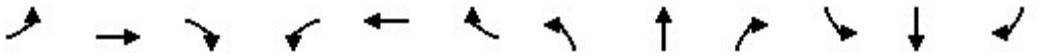
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1339	1699	168	316	1352	456	198	434	492	109	437	823
Future Volume (vph)	1339	1699	168	316	1352	456	198	434	492	109	437	823
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	39.0	54.0	54.0	20.0	35.0	35.0	13.0	35.0	35.0	11.0	33.0	33.0
Total Split (%)	32.5%	45.0%	45.0%	16.7%	29.2%	29.2%	10.8%	29.2%	29.2%	9.2%	27.5%	27.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	34.5	49.7	49.7	15.3	30.5	30.5	8.5	30.5	30.5	6.5	28.5	28.5
Actuated g/C Ratio	0.29	0.41	0.41	0.13	0.25	0.25	0.07	0.25	0.25	0.05	0.24	0.24
v/c Ratio	1.65	0.88	0.25	0.88	1.14	0.96	1.82	0.53	0.90	1.31	1.04	0.65
Control Delay	326.6	38.3	6.8	74.8	112.9	63.3	432.7	41.0	41.7	243.2	76.7	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	326.6	38.3	6.8	74.8	112.9	63.3	432.7	41.0	41.7	243.2	76.7	8.6
LOS	F	D	A	E	F	E	F	D	D	F	E	A
Approach Delay		157.0			96.5			110.2			69.5	
Approach LOS		F			F			F			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.82	
Intersection Signal Delay: 118.6	Intersection LOS: F
Intersection Capacity Utilization 116.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 6: Ontario Mills Drive & 4th Street



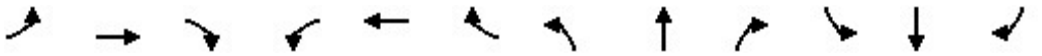


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1455	1847	183	343	1470	496	215	472	535	118	923	447
v/c Ratio	1.65	0.88	0.25	0.88	1.14	0.96	1.82	0.53	0.90	1.31	1.04	0.65
Control Delay	326.6	38.3	6.8	74.8	112.9	63.3	432.7	41.0	41.7	243.2	76.7	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	326.6	38.3	6.8	74.8	112.9	63.3	432.7	41.0	41.7	243.2	76.7	8.6
Queue Length 50th (ft)	~841	476	17	136	~486	283	~251	166	226	~117	~359	0
Queue Length 95th (ft)	#978	546	63	#216	#583	#506	#407	221	#439	#240	#498	102
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	883	2105	740	396	1292	514	118	899	595	90	888	683
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.65	0.88	0.25	0.87	1.14	0.96	1.82	0.53	0.90	1.31	1.04	0.65

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



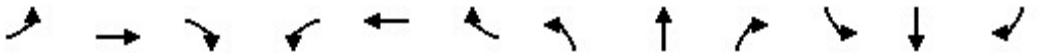
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1339	1699	168	316	1352	456	198	434	492	109	437	823
Future Volume (veh/h)	1339	1699	168	316	1352	456	198	434	492	109	437	823
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1772	1870	1870	1772	1870	1870
Adj Flow Rate, veh/h	1455	1847	183	343	1470	496	215	472	535	118	475	895
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	889	2121	659	390	1298	403	120	903	403	91	444	753
Arrive On Green	0.29	0.42	0.42	0.13	0.25	0.25	0.07	0.25	0.25	0.05	0.24	0.24
Sat Flow, veh/h	3092	5106	1585	3092	5106	1585	1688	3554	1585	1688	1870	3170
Grp Volume(v), veh/h	1455	1847	183	343	1470	496	215	472	535	118	475	895
Grp Sat Flow(s),veh/h/ln	1546	1702	1585	1546	1702	1585	1688	1777	1585	1688	1870	1585
Q Serve(g_s), s	34.5	39.8	9.2	13.1	30.5	30.5	8.5	13.7	30.5	6.5	28.5	28.5
Cycle Q Clear(g_c), s	34.5	39.8	9.2	13.1	30.5	30.5	8.5	13.7	30.5	6.5	28.5	28.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	889	2121	659	390	1298	403	120	903	403	91	444	753
V/C Ratio(X)	1.64	0.87	0.28	0.88	1.13	1.23	1.80	0.52	1.33	1.29	1.07	1.19
Avail Cap(c_a), veh/h	889	2121	659	399	1298	403	120	903	403	91	444	753
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.8	32.1	23.2	51.5	44.8	44.7	55.7	38.5	44.7	56.8	45.7	45.7
Incr Delay (d2), s/veh	291.7	4.2	0.2	19.3	69.8	124.0	390.6	0.5	163.9	190.8	62.4	98.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	49.0	16.8	3.5	6.1	21.1	25.7	16.6	6.0	30.2	7.6	20.8	21.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	334.4	36.4	23.4	70.8	114.6	168.7	446.3	39.0	208.6	247.6	108.2	143.7
LnGrp LOS	F	D	C	E	F	F	F	D	F	F	F	F
Approach Vol, veh/h		3485			2309			1222			1488	
Approach Delay, s/veh		160.1			119.7			184.9			140.6	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	35.0	19.6	54.4	13.0	33.0	39.0	35.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	30.5	15.5	49.5	8.5	28.5	34.5	30.5
Max Q Clear Time (g_c+I1), s	8.5	32.5	15.1	41.8	10.5	30.5	36.5	32.5
Green Ext Time (p_c), s	0.0	0.0	0.1	6.5	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	149.3
HCM 6th LOS	F

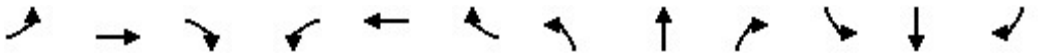
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.972			0.936				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.982	
Satd. Flow (prot)	3072	5085	1583	1676	4943	0	1676	3313	0	1593	1738	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.982	
Satd. Flow (perm)	3072	5085	1583	1676	4943	0	1676	3313	0	1593	1738	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109		41			85				191
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



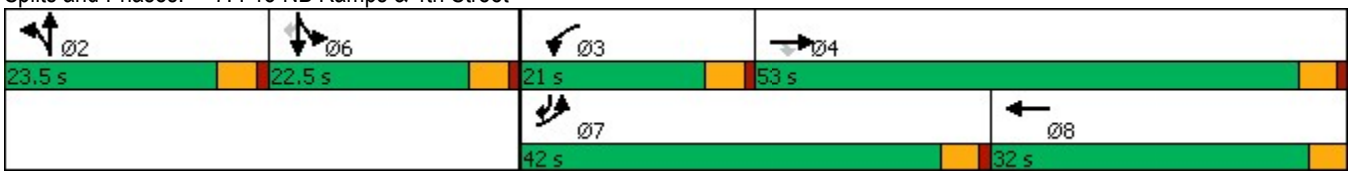
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1164	988	135	111	1045	239	166	108	82	201	95	876
Future Volume (vph)	1164	988	135	111	1045	239	166	108	82	201	95	876
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1213	1029	141	116	1089	249	173	113	85	209	99	913
Shared Lane Traffic (%)										27%		
Lane Group Flow (vph)	1213	1029	141	116	1338	0	173	198	0	153	155	913

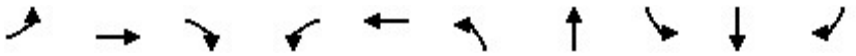
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	1164	988	135	111	1045	166	108	201	95	876
Future Volume (vph)	1164	988	135	111	1045	166	108	201	95	876
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	42.0	53.0	53.0	21.0	32.0	23.5	23.5	22.5	22.5	42.0
Total Split (%)	35.0%	44.2%	44.2%	17.5%	26.7%	19.6%	19.6%	18.8%	18.8%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	37.6	52.5	52.5	12.7	28.6	15.8	15.8	14.9	14.9	57.1
Actuated g/C Ratio	0.33	0.46	0.46	0.11	0.25	0.14	0.14	0.13	0.13	0.50
v/c Ratio	1.20	0.44	0.18	0.62	1.05	0.75	0.37	0.74	0.68	0.64
Control Delay	133.3	23.0	7.2	63.7	81.1	67.7	27.2	69.0	63.4	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	133.3	23.0	7.2	63.7	81.1	67.7	27.2	69.0	63.4	18.8
LOS	F	C	A	E	F	E	C	E	E	B
Approach Delay		78.2			79.7		46.1		30.8	
Approach LOS		E			E		D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 114	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 65.7	Intersection LOS: E
Intersection Capacity Utilization 95.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street



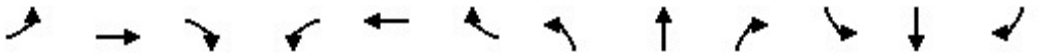


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1213	1029	141	116	1338	173	198	153	155	913
v/c Ratio	1.20	0.44	0.18	0.62	1.05	0.75	0.37	0.74	0.68	0.64
Control Delay	133.3	23.0	7.2	63.7	81.1	67.7	27.2	69.0	63.4	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	133.3	23.0	7.2	63.7	81.1	67.7	27.2	69.0	63.4	18.8
Queue Length 50th (ft)	~579	193	13	84	~403	125	40	116	116	221
Queue Length 95th (ft)	#742	257	56	147	#523	206	77	196	195	306
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	1014	2342	787	243	1270	280	625	252	275	1417
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.20	0.44	0.18	0.48	1.05	0.62	0.32	0.61	0.56	0.64

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1164	988	135	111	1045	239	166	108	82	201	95	876
Future Volume (veh/h)	1164	988	135	111	1045	239	166	108	82	201	95	876
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1772	1870	1870	1772	1870	1870	1772	1870	1772
Adj Flow Rate, veh/h	1212	1029	141	116	1089	249	173	112	85	154	176	912
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	996	2466	765	142	1017	232	209	247	173	261	289	1432
Arrive On Green	0.32	0.48	0.48	0.08	0.24	0.24	0.12	0.12	0.12	0.15	0.15	0.15
Sat Flow, veh/h	3092	5106	1585	1688	4154	949	1688	1996	1399	1688	1870	3003
Grp Volume(v), veh/h	1212	1029	141	116	892	446	173	99	98	154	176	912
Grp Sat Flow(s),veh/h/ln	1546	1702	1585	1688	1702	1699	1688	1777	1618	1688	1870	1502
Q Serve(g_s), s	37.5	15.2	5.9	7.9	28.5	28.5	11.7	6.0	6.6	9.9	10.2	18.0
Cycle Q Clear(g_c), s	37.5	15.2	5.9	7.9	28.5	28.5	11.7	6.0	6.6	9.9	10.2	18.0
Prop In Lane	1.00		1.00	1.00		0.56	1.00		0.86	1.00		1.00
Lane Grp Cap(c), veh/h	996	2466	765	142	833	416	209	220	201	261	289	1432
V/C Ratio(X)	1.22	0.42	0.18	0.82	1.07	1.07	0.83	0.45	0.49	0.59	0.61	0.64
Avail Cap(c_a), veh/h	996	2466	765	239	833	416	275	290	264	261	289	1432
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	19.5	17.1	52.5	44.0	44.0	49.8	47.3	47.6	45.8	45.9	22.9
Incr Delay (d2), s/veh	106.9	0.1	0.1	11.0	51.9	64.5	14.5	1.4	1.8	3.5	3.7	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	28.8	6.0	2.2	3.8	17.9	19.3	5.7	2.7	2.8	4.4	5.0	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	146.4	19.6	17.2	63.4	95.9	108.5	64.2	48.7	49.4	49.3	49.6	23.8
LnGrp LOS	F	B	B	E	F	F	E	D	D	D	D	C
Approach Vol, veh/h		2382			1454			370			1242	
Approach Delay, s/veh		84.0			97.2			56.2			30.6	
Approach LOS		F			F			E			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		18.9	14.3	60.7		22.5	42.0	33.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		19.0	16.5	48.5		18.0	37.5	* 29				
Max Q Clear Time (g_c+I1), s		13.7	9.9	17.2		20.0	39.5	30.5				
Green Ext Time (p_c), s		0.8	0.1	9.4		0.0	0.0	0.0				

Intersection Summary	
HCM 6th Ctrl Delay	73.5
HCM 6th LOS	E

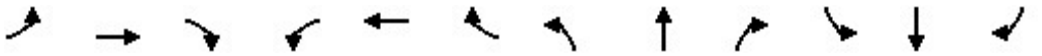
Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1600	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.907				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3210	0	4202	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3210	0	4202	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		92				149			149			149
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



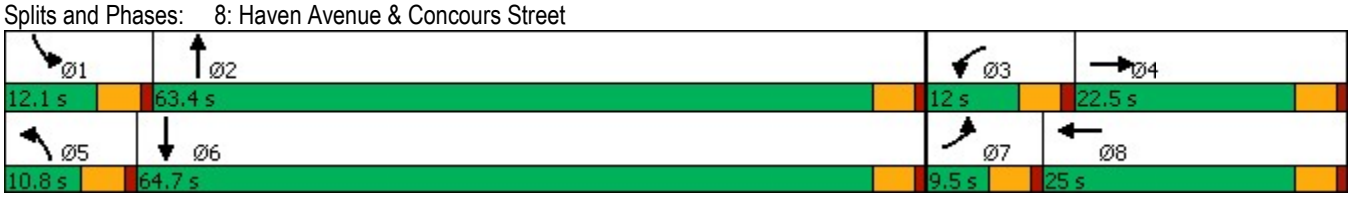
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	36	55	90	249	133	135	67	3292	256	178	2670	39
Future Volume (vph)	36	55	90	249	133	135	67	3292	256	178	2670	39
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	37	56	92	254	136	138	68	3359	261	182	2724	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	148	0	254	136	138	68	3359	261	182	2724	40

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	36	55	249	133	135	67	3292	256	178	2670	39
Future Volume (vph)	36	55	249	133	135	67	3292	256	178	2670	39
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	12.0	25.0		10.8	63.4		12.1	64.7	
Total Split (%)	8.6%	20.5%	10.9%	22.7%		9.8%	57.6%		11.0%	58.8%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.0	7.4	7.5	13.8	99.4	6.2	58.9	99.4	7.6	62.4	99.4
Actuated g/C Ratio	0.05	0.07	0.08	0.14	1.00	0.06	0.59	1.00	0.08	0.63	1.00
v/c Ratio	0.24	0.46	0.80	0.28	0.09	0.36	0.88	0.16	0.78	0.68	0.03
Control Delay	50.0	23.2	65.3	41.5	0.1	50.7	21.4	0.2	68.3	13.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	23.2	65.3	41.5	0.1	50.7	21.4	0.2	68.3	13.8	0.0
LOS	D	C	E	D	A	D	C	A	E	B	A
Approach Delay		28.6		42.1			20.4			17.0	
Approach LOS		C		D			C			B	

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 99.4	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 20.8	Intersection LOS: C
Intersection Capacity Utilization 78.4%	ICU Level of Service D
Analysis Period (min) 15	

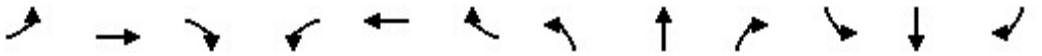
Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	37	148	254	136	138	68	3359	261	182	2724	40
v/c Ratio	0.24	0.46	0.80	0.28	0.09	0.36	0.88	0.16	0.78	0.68	0.03
Control Delay	50.0	23.2	65.3	41.5	0.1	50.7	21.4	0.2	68.3	13.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	23.2	65.3	41.5	0.1	50.7	21.4	0.2	68.3	13.8	0.0
Queue Length 50th (ft)	11	17	57	43	0	21	489	0	59	315	0
Queue Length 95th (ft)	28	48	#103	73	0	44	591	0	#118	386	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	154	656	316	729	1583	194	3796	1583	234	4022	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.23	0.80	0.19	0.09	0.35	0.88	0.16	0.78	0.68	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



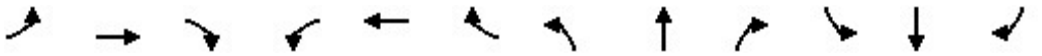
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	55	90	249	133	135	67	3292	256	178	2670	39
Future Volume (veh/h)	36	55	90	249	133	135	67	3292	256	178	2670	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1575	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	37	56	92	254	136	0	68	3359	0	182	2724	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	145	129	317	443		131	3778		235	3994	
Arrive On Green	0.03	0.08	0.08	0.08	0.12	0.00	0.04	0.59	0.00	0.08	0.62	0.00
Sat Flow, veh/h	3092	1777	1585	4230	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	37	56	92	254	136	0	68	3359	0	182	2724	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1410	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	1.2	3.0	5.7	5.9	3.5	0.0	2.2	45.1	0.0	5.8	27.8	0.0
Cycle Q Clear(g_c), s	1.2	3.0	5.7	5.9	3.5	0.0	2.2	45.1	0.0	5.8	27.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	99	145	129	317	443		131	3778		235	3994	
V/C Ratio(X)	0.37	0.39	0.71	0.80	0.31		0.52	0.89		0.77	0.68	
Avail Cap(c_a), veh/h	155	320	285	317	729		195	3790		235	3994	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	47.4	43.5	44.8	45.5	39.8	0.0	46.9	17.8	0.0	45.3	12.5	0.0
Incr Delay (d2), s/veh	2.3	1.7	7.0	13.6	0.4	0.0	3.1	3.0	0.0	14.8	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.4	2.5	2.5	1.5	0.0	0.9	15.8	0.0	2.7	9.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.7	45.2	51.7	59.1	40.2	0.0	50.0	20.8	0.0	60.2	12.9	0.0
LnGrp LOS	D	D	D	E	D		D	C		E	B	
Approach Vol, veh/h		185			390	A		3427	A		2906	A
Approach Delay, s/veh		49.4			52.5			21.4			15.9	
Approach LOS		D			D			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.1	63.2	12.0	12.7	8.7	66.6	7.7	17.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.6	58.9	7.5	18.0	6.3	60.2	5.0	20.5
Max Q Clear Time (g_c+I1), s	7.8	47.1	7.9	7.7	4.2	29.8	3.2	5.5
Green Ext Time (p_c), s	0.0	11.6	0.0	0.5	0.0	26.6	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	21.6
HCM 6th LOS	C

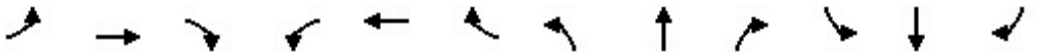
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1900	1900	1900	1900	1800	1900	1900	1800	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.936			0.946						0.998	
Flt Protected	0.950	0.972			0.971		0.950			0.950		
Satd. Flow (prot)	1593	1610	0	0	1711	0	1676	5085	0	1676	5075	0
Flt Permitted	0.950	0.972					0.950			0.950		
Satd. Flow (perm)	1593	1610	0	0	1762	0	1676	5085	0	1676	5075	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		95			95						2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



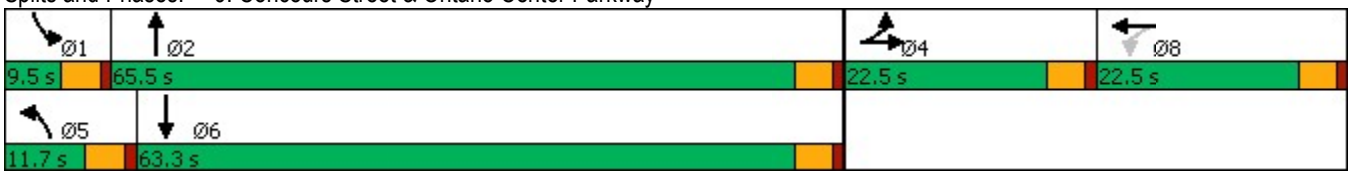
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	66	0	17	20	0	13	6	2522	7	1	1521	20
Future Volume (vph)	66	0	17	20	0	13	6	2522	7	1	1521	20
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	69	0	18	21	0	14	6	2655	7	1	1601	21
Shared Lane Traffic (%)	35%											
Lane Group Flow (vph)	45	42	0	0	35	0	6	2662	0	1	1622	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	66	0	20	0	6	2522	1	1521
Future Volume (vph)	66	0	20	0	6	2522	1	1521
Turn Type	Split	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	4	4		8	5	2	1	6
Permitted Phases			8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	11.7	65.5	9.5	63.3
Total Split (%)	18.8%	18.8%	18.8%	18.8%	9.8%	54.6%	7.9%	52.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	8.0	8.0		5.5	5.9	69.0	5.0	68.6
Actuated g/C Ratio	0.09	0.09		0.06	0.07	0.76	0.06	0.76
v/c Ratio	0.32	0.18		0.18	0.05	0.69	0.01	0.42
Control Delay	45.9	1.8		2.0	43.0	9.8	44.0	6.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	1.8		2.0	43.0	9.8	44.0	6.6
LOS	D	A		A	D	A	D	A
Approach Delay		24.6		2.0		9.9		6.6
Approach LOS		C		A		A		A

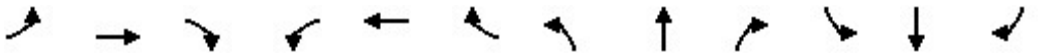
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 90.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 8.9	Intersection LOS: A
Intersection Capacity Utilization 65.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	45	42	35	6	2662	1	1622
v/c Ratio	0.32	0.18	0.18	0.05	0.69	0.01	0.42
Control Delay	45.9	1.8	2.0	43.0	9.8	44.0	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	1.8	2.0	43.0	9.8	44.0	6.6
Queue Length 50th (ft)	25	0	0	3	297	1	126
Queue Length 95th (ft)	65	0	0	17	556	6	254
Internal Link Dist (ft)		319	68		111		176
Turn Bay Length (ft)	170			115		120	
Base Capacity (vph)	319	398	429	134	3884	93	3858
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.11	0.08	0.04	0.69	0.01	0.42

Intersection Summary



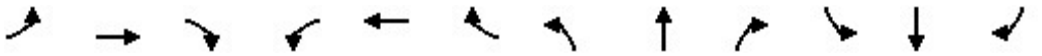
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	0	17	20	0	13	6	2522	7	1	1521	20
Future Volume (veh/h)	66	0	17	20	0	13	6	2522	7	1	1521	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1870	1870	1870	1870	1870	1772	1870	1870	1772	1870	1870
Adj Flow Rate, veh/h	44	36	18	21	0	14	6	2655	7	1	1601	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	93	65	32	34	0	23	13	3609	10	2	3531	46
Arrive On Green	0.06	0.06	0.06	0.03	0.00	0.03	0.01	0.69	0.69	0.00	0.68	0.68
Sat Flow, veh/h	1688	1176	588	1018	0	679	1688	5258	14	1688	5194	68
Grp Volume(v), veh/h	44	0	54	35	0	0	6	1718	944	1	1049	573
Grp Sat Flow(s),veh/h/ln	1688	0	1764	1697	0	0	1688	1702	1868	1688	1702	1858
Q Serve(g_s), s	2.0	0.0	2.4	1.6	0.0	0.0	0.3	25.8	25.8	0.0	11.5	11.5
Cycle Q Clear(g_c), s	2.0	0.0	2.4	1.6	0.0	0.0	0.3	25.8	25.8	0.0	11.5	11.5
Prop In Lane	1.00		0.33	0.60		0.40	1.00		0.01	1.00		0.04
Lane Grp Cap(c), veh/h	93	0	97	57	0	0	13	2336	1282	2	2314	1263
V/C Ratio(X)	0.47	0.00	0.55	0.61	0.00	0.00	0.46	0.74	0.74	0.43	0.45	0.45
Avail Cap(c_a), veh/h	377	0	394	379	0	0	151	2578	1415	105	2485	1356
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.9	0.0	37.1	38.4	0.0	0.0	39.8	8.0	8.0	40.2	6.0	6.0
Incr Delay (d2), s/veh	3.7	0.0	4.9	10.1	0.0	0.0	22.7	1.0	1.8	93.3	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	1.1	0.8	0.0	0.0	0.2	7.5	8.5	0.1	3.3	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.6	0.0	42.0	48.5	0.0	0.0	62.5	9.0	9.9	133.5	6.1	6.2
LnGrp LOS	D	A	D	D	A	A	E	A	A	F	A	A
Approach Vol, veh/h		98			35			2668			1623	
Approach Delay, s/veh		41.4			48.5			9.4			6.2	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	59.8		8.9	5.1	59.3		7.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	61.0		18.0	7.2	58.8		18.0				
Max Q Clear Time (g_c+I1), s	2.0	27.8		4.4	2.3	13.5		3.6				
Green Ext Time (p_c), s	0.0	27.5		0.3	0.0	17.3		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	9.3
HCM 6th LOS	A

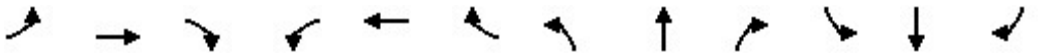
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			209			193			193			193
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



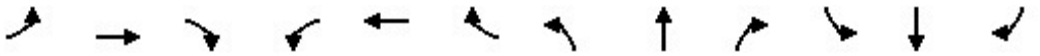
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	475	186	201	242	96	168	261	2329	182	258	1735	181
Future Volume (vph)	475	186	201	242	96	168	261	2329	182	258	1735	181
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	495	194	209	252	100	175	272	2426	190	269	1807	189
Shared Lane Traffic (%)												
Lane Group Flow (vph)	495	194	209	252	100	175	272	2426	190	269	1807	189

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	475	186	201	242	96	168	261	2329	182	258	1735	181
Future Volume (vph)	475	186	201	242	96	168	261	2329	182	258	1735	181
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	24.1	26.7		19.9	22.5		19.8	48.4		15.0	43.6	
Total Split (%)	21.9%	24.3%		18.1%	20.5%		18.0%	44.0%		13.6%	39.6%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	19.1	14.3	99.7	13.0	8.2	99.7	13.4	43.9	99.7	10.5	41.0	99.7
Actuated g/C Ratio	0.19	0.14	1.00	0.13	0.08	1.00	0.13	0.44	1.00	0.11	0.41	1.00
v/c Ratio	0.84	0.38	0.13	0.63	0.34	0.11	0.66	0.86	0.12	0.83	0.69	0.12
Control Delay	53.5	41.7	0.2	48.5	46.6	0.1	49.3	29.4	0.2	66.5	26.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	41.7	0.2	48.5	46.6	0.1	49.3	29.4	0.2	66.5	26.3	0.2
LOS	D	D	A	D	D	A	D	C	A	E	C	A
Approach Delay		38.5			32.1			29.3			28.9	
Approach LOS		D			C			C			C	

Intersection Summary			
Cycle Length: 110			
Actuated Cycle Length: 99.7			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 30.7		Intersection LOS: C	
Intersection Capacity Utilization 76.3%		ICU Level of Service D	
Analysis Period (min) 15			

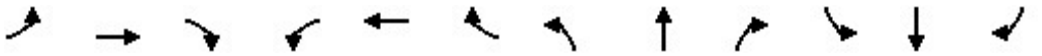
Splits and Phases: 10: Milliken Avenue & Concours Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	495	194	209	252	100	175	272	2426	190	269	1807	189
v/c Ratio	0.84	0.38	0.13	0.63	0.34	0.11	0.66	0.86	0.12	0.83	0.69	0.12
Control Delay	53.5	41.7	0.2	48.5	46.6	0.1	49.3	29.4	0.2	66.5	26.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	41.7	0.2	48.5	46.6	0.1	49.3	29.4	0.2	66.5	26.3	0.2
Queue Length 50th (ft)	157	60	0	79	32	0	85	397	0	88	273	0
Queue Length 95th (ft)	#244	96	0	120	58	0	129	467	0	#160	335	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	603	788	1583	474	639	1583	471	2822	1583	323	2637	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.25	0.13	0.53	0.16	0.11	0.58	0.86	0.12	0.83	0.69	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



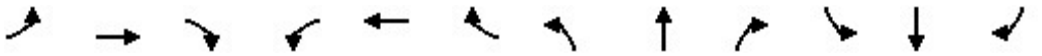
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	475	186	201	242	96	168	261	2329	182	258	1735	181
Future Volume (veh/h)	475	186	201	242	96	168	261	2329	182	258	1735	181
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	495	194	0	252	100	0	272	2426	0	269	1807	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	569	470		326	192		346	2965		331	2935	
Arrive On Green	0.18	0.13	0.00	0.11	0.05	0.00	0.11	0.46	0.00	0.11	0.46	0.00
Sat Flow, veh/h	3092	3554	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	495	194	0	252	100	0	272	2426	0	269	1807	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	14.4	4.6	0.0	7.4	2.5	0.0	7.9	30.3	0.0	7.9	19.7	0.0
Cycle Q Clear(g_c), s	14.4	4.6	0.0	7.4	2.5	0.0	7.9	30.3	0.0	7.9	19.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	569	470		326	192		346	2965		331	2935	
V/C Ratio(X)	0.87	0.41		0.77	0.52		0.79	0.82		0.81	0.62	
Avail Cap(c_a), veh/h	653	851		513	690		510	3045		350	2935	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	36.8	36.9	0.0	40.4	42.7	0.0	40.1	21.6	0.0	40.5	19.1	0.0
Incr Delay (d2), s/veh	11.1	0.6	0.0	3.9	2.2	0.0	4.9	1.8	0.0	12.9	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	2.0	0.0	2.9	1.2	0.0	3.2	11.1	0.0	3.6	7.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.8	37.5	0.0	44.3	44.9	0.0	45.0	23.5	0.0	53.4	19.5	0.0
LnGrp LOS	D	D		D	D		D	C		D	B	
Approach Vol, veh/h		689	A		352	A		2698	A		2076	A
Approach Delay, s/veh		44.9			44.5			25.6			23.9	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.4	47.2	14.3	16.8	14.9	46.8	21.6	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	43.9	15.4	22.2	15.3	39.1	19.6	18.0
Max Q Clear Time (g_c+I1), s	9.9	32.3	9.4	6.6	9.9	21.7	16.4	4.5
Green Ext Time (p_c), s	0.1	10.5	0.4	1.0	0.4	12.2	0.6	0.4

Intersection Summary	
HCM 6th Ctrl Delay	28.4
HCM 6th LOS	C

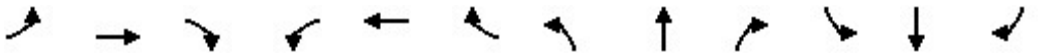
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1600	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3539	1583	4202	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3539	1583	4202	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55			177			242			177
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



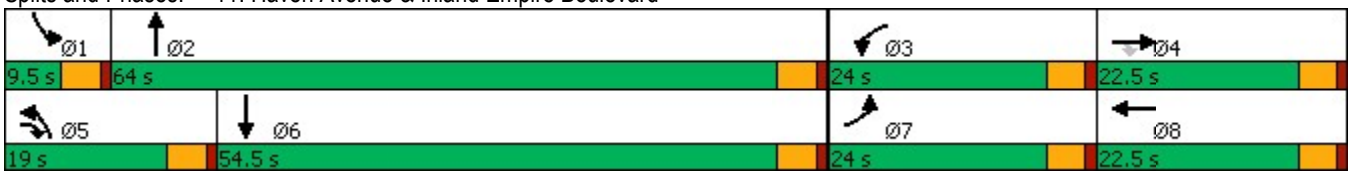
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	278	306	676	893	220	57	492	2653	609	58	3102	151
Future Volume (vph)	278	306	676	893	220	57	492	2653	609	58	3102	151
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	299	329	727	960	237	61	529	2853	655	62	3335	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	299	329	727	960	237	61	529	2853	655	62	3335	162

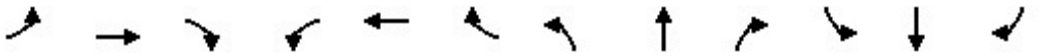
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	278	306	676	893	220	57	492	2653	609	58	3102	151
Future Volume (vph)	278	306	676	893	220	57	492	2653	609	58	3102	151
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	24.0	22.5	19.0	24.0	22.5		19.0	64.0		9.5	54.5	
Total Split (%)	20.0%	18.8%	15.8%	20.0%	18.8%		15.8%	53.3%		7.9%	45.4%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	16.3	15.6	34.6	19.5	18.9	117.7	14.5	61.5	117.7	5.0	50.0	117.7
Actuated g/C Ratio	0.14	0.13	0.29	0.17	0.16	1.00	0.12	0.52	1.00	0.04	0.42	1.00
v/c Ratio	0.71	0.70	1.44	1.38	0.42	0.04	1.40	0.85	0.41	0.48	1.22	0.10
Control Delay	57.9	57.3	240.1	217.2	47.6	0.1	233.1	28.2	0.8	68.1	136.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.9	57.3	240.1	217.2	47.6	0.1	233.1	28.2	0.8	68.1	136.0	0.1
LOS	E	E	F	F	D	A	F	C	A	E	F	A
Approach Delay		155.5			174.7			50.6			128.6	
Approach LOS		F			F			D			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.44	
Intersection Signal Delay: 107.0	Intersection LOS: F
Intersection Capacity Utilization 118.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard



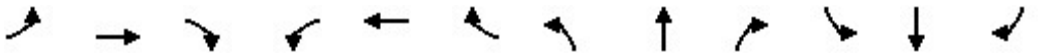


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	299	329	727	960	237	61	529	2853	655	62	3335	162
v/c Ratio	0.71	0.70	1.44	1.38	0.42	0.04	1.40	0.85	0.41	0.48	1.22	0.10
Control Delay	57.9	57.3	240.1	217.2	47.6	0.1	233.1	28.2	0.8	68.1	136.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.9	57.3	240.1	217.2	47.6	0.1	233.1	28.2	0.8	68.1	136.0	0.1
Queue Length 50th (ft)	113	127	~723	~345	86	0	~278	547	0	24	~913	0
Queue Length 95th (ft)	160	177	#961	#442	131	0	#395	621	0	48	#1000	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	509	541	504	696	567	1583	378	3348	1583	130	2724	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.61	1.44	1.38	0.42	0.04	1.40	0.85	0.41	0.48	1.22	0.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



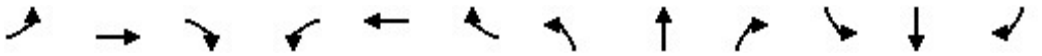
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	278	306	676	893	220	57	492	2653	609	58	3102	151
Future Volume (veh/h)	278	306	676	893	220	57	492	2653	609	58	3102	151
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1575	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	299	329	727	960	237	0	529	2853	0	62	3335	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	358	533	429	687	699		374	3224		113	2681	
Arrive On Green	0.12	0.15	0.15	0.16	0.20	0.00	0.12	0.50	0.00	0.04	0.42	0.00
Sat Flow, veh/h	3092	3554	1585	4230	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	299	329	727	960	237	0	529	2853	0	62	3335	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1410	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	11.4	10.4	18.0	19.5	6.9	0.0	14.5	47.7	0.0	2.4	50.0	0.0
Cycle Q Clear(g_c), s	11.4	10.4	18.0	19.5	6.9	0.0	14.5	47.7	0.0	2.4	50.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	358	533	429	687	699		374	3224		113	2681	
V/C Ratio(X)	0.83	0.62	1.69	1.40	0.34		1.42	0.88		0.55	1.24	
Avail Cap(c_a), veh/h	502	533	429	687	699		374	3224		129	2681	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	51.9	47.8	43.7	50.3	41.5	0.0	52.8	26.8	0.0	56.9	35.0	0.0
Incr Delay (d2), s/veh	8.3	2.1	322.0	187.3	0.3	0.0	202.3	3.3	0.0	4.2	113.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	4.8	51.0	18.8	3.1	0.0	16.1	18.4	0.0	1.0	40.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.2	49.9	365.8	237.5	41.8	0.0	255.1	30.1	0.0	61.0	148.1	0.0
LnGrp LOS	E	D	F	F	D		F	C		E	F	
Approach Vol, veh/h		1355			1197	A		3382	A		3397	A
Approach Delay, s/veh		221.7			198.7			65.3			146.5	
Approach LOS		F			F			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.9	64.6	24.0	22.5	19.0	54.5	18.4	28.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	59.5	19.5	18.0	14.5	50.0	19.5	18.0
Max Q Clear Time (g_c+I1), s	4.4	49.7	21.5	20.0	16.5	52.0	13.4	8.9
Green Ext Time (p_c), s	0.0	9.4	0.0	0.0	0.0	0.0	0.5	0.9

Intersection Summary	
HCM 6th Ctrl Delay	134.7
HCM 6th LOS	F

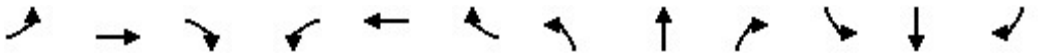
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			397			177			177			177
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



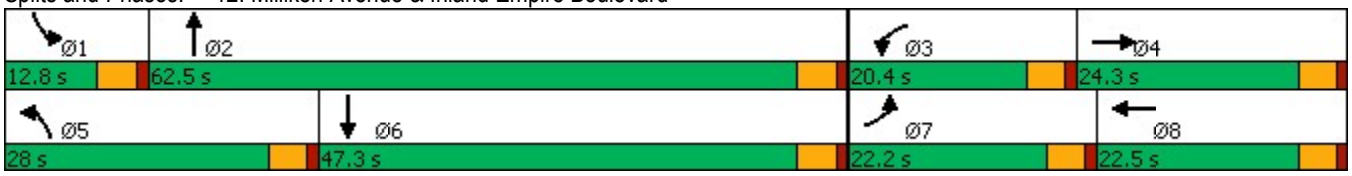
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	412	402	452	297	109	137	548	2226	511	135	1967	166
Future Volume (vph)	412	402	452	297	109	137	548	2226	511	135	1967	166
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	434	423	476	313	115	144	577	2343	538	142	2071	175
Shared Lane Traffic (%)												
Lane Group Flow (vph)	434	423	476	313	115	144	577	2343	538	142	2071	175

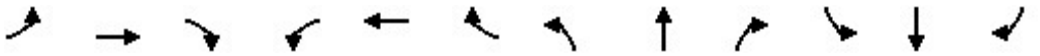
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	412	402	452	297	109	137	548	2226	511	135	1967	166
Future Volume (vph)	412	402	452	297	109	137	548	2226	511	135	1967	166
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	22.2	24.3		20.4	22.5		28.0	62.5		12.8	47.3	
Total Split (%)	18.5%	20.3%		17.0%	18.8%		23.3%	52.1%		10.7%	39.4%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	17.7	18.0	117.4	15.1	15.4	117.4	23.4	58.1	117.4	8.2	42.9	117.4
Actuated g/C Ratio	0.15	0.15	1.00	0.13	0.13	1.00	0.20	0.49	1.00	0.07	0.37	1.00
v/c Ratio	0.94	0.78	0.30	0.79	0.25	0.09	0.94	0.74	0.34	0.67	0.89	0.11
Control Delay	78.7	58.8	0.5	65.3	46.8	0.1	71.6	25.7	0.6	69.6	40.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.7	58.8	0.5	65.3	46.8	0.1	71.6	25.7	0.6	69.6	40.9	0.1
LOS	E	E	A	E	D	A	E	C	A	E	D	A
Approach Delay		44.4			45.2			29.5			39.7	
Approach LOS		D			D			C			D	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 117.4			
Natural Cycle: 110			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 36.3		Intersection LOS: D	
Intersection Capacity Utilization 81.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	434	423	476	313	115	144	577	2343	538	142	2071	175
v/c Ratio	0.94	0.78	0.30	0.79	0.25	0.09	0.94	0.74	0.34	0.67	0.89	0.11
Control Delay	78.7	58.8	0.5	65.3	46.8	0.1	71.6	25.7	0.6	69.6	40.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.7	58.8	0.5	65.3	46.8	0.1	71.6	25.7	0.6	69.6	40.9	0.1
Queue Length 50th (ft)	173	165	0	121	41	0	229	415	0	56	437	0
Queue Length 95th (ft)	#276	222	0	#184	71	0	#343	463	0	#97	492	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	463	597	1583	416	543	1583	615	3172	1583	217	2339	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.71	0.30	0.75	0.21	0.09	0.94	0.74	0.34	0.65	0.89	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	412	402	452	297	109	137	548	2226	511	135	1967	166
Future Volume (veh/h)	412	402	452	297	109	137	548	2226	511	135	1967	166
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	434	423	0	313	115	0	577	2343	0	142	2071	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	483	511		370	382		628	3303		194	2399	
Arrive On Green	0.16	0.14	0.00	0.12	0.11	0.00	0.20	0.51	0.00	0.06	0.37	0.00
Sat Flow, veh/h	3092	3554	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	434	423	0	313	115	0	577	2343	0	142	2071	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	15.5	13.0	0.0	11.1	3.3	0.0	20.5	31.3	0.0	5.1	33.4	0.0
Cycle Q Clear(g_c), s	15.5	13.0	0.0	11.1	3.3	0.0	20.5	31.3	0.0	5.1	33.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	483	511		370	382		628	3303		194	2399	
V/C Ratio(X)	0.90	0.83		0.85	0.30		0.92	0.71		0.73	0.86	
Avail Cap(c_a), veh/h	488	627		438	570		648	3326		229	2455	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	46.5	46.7	0.0	48.4	46.2	0.0	43.8	20.9	0.0	51.7	32.5	0.0
Incr Delay (d2), s/veh	19.3	7.5	0.0	12.4	0.4	0.0	18.0	0.7	0.0	9.6	3.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	6.2	0.0	4.9	1.5	0.0	9.4	11.5	0.0	2.2	13.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.8	54.2	0.0	60.8	46.6	0.0	61.8	21.6	0.0	61.3	35.9	0.0
LnGrp LOS	E	D		E	D		E	C		E	D	
Approach Vol, veh/h		857	A		428	A		2920	A		2213	A
Approach Delay, s/veh		60.1			57.0			29.5			37.5	
Approach LOS		E			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.5	62.1	17.9	20.6	27.3	46.3	22.0	16.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.3	58.0	15.9	19.8	23.5	42.8	17.7	18.0
Max Q Clear Time (g_c+I1), s	7.1	33.3	13.1	15.0	22.5	35.4	17.5	5.3
Green Ext Time (p_c), s	0.0	20.0	0.3	1.2	0.3	6.4	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	38.2
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1800	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.984	0.850				
Flt Protected	0.957					
Satd. Flow (prot)	3224	1441	6408	0	0	6408
Flt Permitted	0.957					
Satd. Flow (perm)	3224	1441	6408	0	0	6408
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	698	440	3128	0	0	3173
Future Volume (vph)	698	440	3128	0	0	3173
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	727	458	3258	0	0	3305
Shared Lane Traffic (%)		19%				
Lane Group Flow (vph)	814	371	3258	0	0	3305

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	698	440	3128	3173
Future Volume (vph)	698	440	3128	3173
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	41.0	41.0
Total Split (%)	36.9%	36.9%	63.1%	63.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	19.0	19.0	36.5	36.5
Actuated g/C Ratio	0.29	0.29	0.57	0.57
v/c Ratio	0.86	0.88	0.90	0.91
Control Delay	32.6	46.0	17.1	17.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	32.6	46.0	17.1	17.9
LOS	C	D	B	B
Approach Delay	36.8		17.1	17.9
Approach LOS	D		B	B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 64.5	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 20.5	Intersection LOS: C
Intersection Capacity Utilization 82.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	814	371	3258	3305
v/c Ratio	0.86	0.88	0.90	0.91
Control Delay	32.6	46.0	17.1	17.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	32.6	46.0	17.1	17.9
Queue Length 50th (ft)	154	150	301	310
Queue Length 95th (ft)	#246	#307	364	#378
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	975	436	3628	3628
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.83	0.85	0.90	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

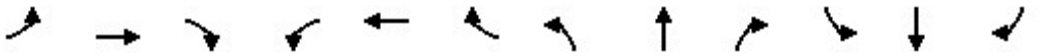
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	698	440	3128	0	0	3173
Future Volume (veh/h)	698	440	3128	0	0	3173
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1772	1870	1870	0	0	1870
Adj Flow Rate, veh/h	786	395	3258	0	0	3305
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	970	456	3677	0	0	3677
Arrive On Green	0.29	0.29	0.57	0.00	0.00	0.57
Sat Flow, veh/h	3375	1585	6958	0	0	6958
Grp Volume(v), veh/h	786	395	3258	0	0	3305
Grp Sat Flow(s),veh/h/ln	1688	1585	1609	0	0	1609
Q Serve(g_s), s	13.8	15.1	28.0	0.0	0.0	28.9
Cycle Q Clear(g_c), s	13.8	15.1	28.0	0.0	0.0	28.9
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	970	456	3677	0	0	3677
V/C Ratio(X)	0.81	0.87	0.89	0.00	0.00	0.90
Avail Cap(c_a), veh/h	1032	485	3683	0	0	3683
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	21.1	21.6	11.9	0.0	0.0	12.0
Incr Delay (d2), s/veh	4.7	14.7	3.0	0.0	0.0	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	7.0	8.5	0.0	0.0	8.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	25.8	36.2	14.8	0.0	0.0	15.4
LnGrp LOS	C	D	B	A	A	B
Approach Vol, veh/h	1181		3258			3305
Approach Delay, s/veh	29.3		14.8			15.4
Approach LOS	C		B			B

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		40.9			40.9	22.8
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		36.5			36.5	19.5
Max Q Clear Time (g_c+I1), s		30.0			30.9	17.1
Green Ext Time (p_c), s		6.4			5.6	1.2

Intersection Summary		
HCM 6th Ctrl Delay		17.3
HCM 6th LOS		B

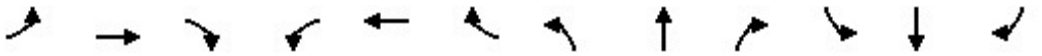
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	1863	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	1863	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			147			136			182			55
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



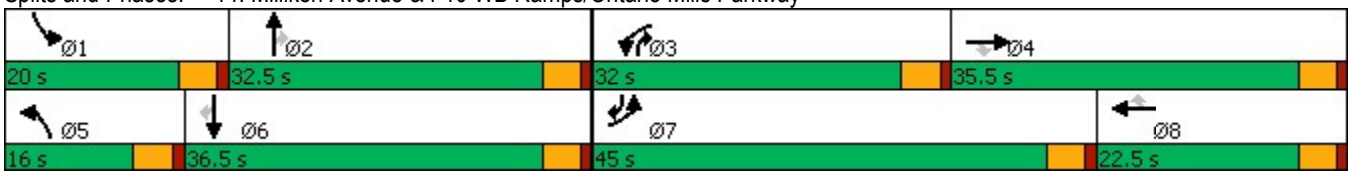
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1085	275	332	354	421	89	337	1428	634	465	1502	670
Future Volume (vph)	1085	275	332	354	421	89	337	1428	634	465	1502	670
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1130	286	346	369	439	93	351	1488	660	484	1565	698
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1130	286	346	369	439	93	351	1488	660	484	1565	698

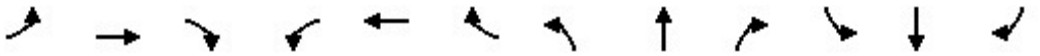
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1085	275	332	354	421	89	337	1428	634	465	1502	670
Future Volume (vph)	1085	275	332	354	421	89	337	1428	634	465	1502	670
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	45.0	35.5	35.5	32.0	22.5	22.5	16.0	32.5	32.0	20.0	36.5	45.0
Total Split (%)	37.5%	29.6%	29.6%	26.7%	18.8%	18.8%	13.3%	27.1%	26.7%	16.7%	30.4%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	40.5	36.3	36.3	21.7	17.5	17.5	11.5	28.0	54.2	15.5	32.0	77.0
Actuated g/C Ratio	0.34	0.30	0.30	0.18	0.15	0.15	0.10	0.23	0.45	0.13	0.27	0.64
v/c Ratio	1.09	0.51	0.59	0.66	0.85	0.27	1.19	0.99	0.81	1.22	0.91	0.67
Control Delay	92.2	39.3	25.5	51.0	65.9	4.3	160.0	67.0	28.2	162.4	51.6	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.2	39.3	25.5	51.0	65.9	4.3	160.0	67.0	28.2	162.4	51.6	16.2
LOS	F	D	C	D	E	A	F	E	C	F	D	B
Approach Delay		70.5			53.5			69.8			62.1	
Approach LOS		E			D			E			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.5	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.22	
Intersection Signal Delay: 65.4	Intersection LOS: E
Intersection Capacity Utilization 96.8%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway



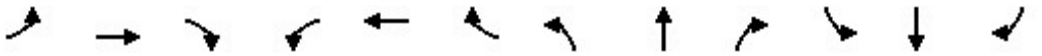


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1130	286	346	369	439	93	351	1488	660	484	1565	698
v/c Ratio	1.09	0.51	0.59	0.66	0.85	0.27	1.19	0.99	0.81	1.22	0.91	0.67
Control Delay	92.2	39.3	25.5	51.0	65.9	4.3	160.0	67.0	28.2	162.4	51.6	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.2	39.3	25.5	51.0	65.9	4.3	160.0	67.0	28.2	162.4	51.6	16.2
Queue Length 50th (ft)	~508	180	128	139	175	0	~169	336	330	~237	343	292
Queue Length 95th (ft)	#641	288	249	179	#254	18	#266	#423	456	#345	#398	427
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	1041	566	583	707	532	354	295	1502	885	398	1716	1039
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.09	0.51	0.59	0.52	0.83	0.26	1.19	0.99	0.75	1.22	0.91	0.67

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1085	275	332	354	421	89	337	1428	634	465	1502	670
Future Volume (veh/h)	1085	275	332	354	421	89	337	1428	634	465	1502	670
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	1130	286	346	369	439	93	351	1488	660	484	1565	698
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1053	638	540	439	506	225	299	1515	598	403	1731	966
Arrive On Green	0.34	0.34	0.34	0.14	0.14	0.14	0.10	0.24	0.24	0.13	0.27	0.27
Sat Flow, veh/h	3092	1870	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	1130	286	346	369	439	93	351	1488	660	484	1565	698
Grp Sat Flow(s),veh/h/ln	1546	1870	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	40.5	14.1	21.9	13.8	14.4	6.4	11.5	27.4	28.0	15.5	27.9	32.0
Cycle Q Clear(g_c), s	40.5	14.1	21.9	13.8	14.4	6.4	11.5	27.4	28.0	15.5	27.9	32.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1053	638	540	439	506	225	299	1515	598	403	1731	966
V/C Ratio(X)	1.07	0.45	0.64	0.84	0.87	0.41	1.17	0.98	1.10	1.20	0.90	0.72
Avail Cap(c_a), veh/h	1053	638	540	715	538	240	299	1515	598	403	1731	966
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.2	30.5	33.0	49.7	49.9	46.5	53.7	45.2	37.0	51.7	42.0	16.2
Incr Delay (d2), s/veh	49.5	0.5	2.5	4.9	13.6	1.2	107.7	18.9	68.5	112.0	7.1	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	22.3	6.5	8.7	5.6	7.3	2.6	8.9	12.8	28.3	12.3	11.9	13.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	88.8	31.0	35.6	54.6	63.5	47.7	161.5	64.2	105.5	163.7	49.1	18.9
LnGrp LOS	F	C	D	D	E	D	F	E	F	F	D	B
Approach Vol, veh/h		1762			901			2499			2747	
Approach Delay, s/veh		68.9			58.2			88.7			61.6	
Approach LOS		E			E			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	32.5	21.4	45.0	16.0	36.5	45.0	21.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	28.0	27.5	31.0	11.5	32.0	40.5	18.0
Max Q Clear Time (g_c+I1), s	17.5	30.0	15.8	23.9	13.5	34.0	42.5	16.4
Green Ext Time (p_c), s	0.0	0.0	1.0	1.8	0.0	0.0	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	71.4
HCM 6th LOS	E

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.993	0.850				
Flt Protected	0.955					
Satd. Flow (prot)	3247	1441	0	6408	6408	0
Flt Permitted	0.955					
Satd. Flow (perm)	3247	1441	0	6408	6408	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	2	2				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

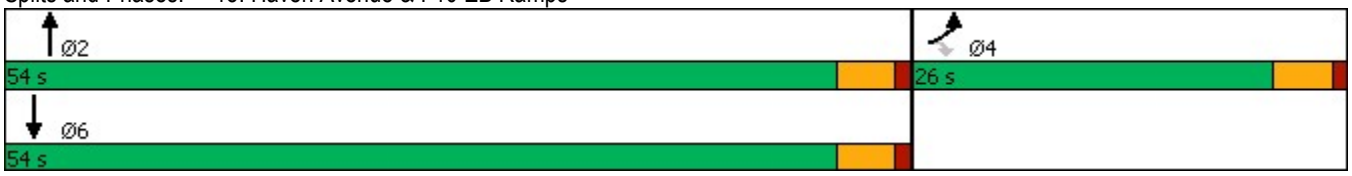
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	707	345	0	3451	2660	0
Future Volume (vph)	707	345	0	3451	2660	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	736	359	0	3595	2771	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	772	323	0	3595	2771	0

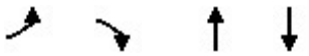
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	707	345	3451	2660
Future Volume (vph)	707	345	3451	2660
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	54.0	54.0
Total Split (%)	32.5%	32.5%	67.5%	67.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	20.9	20.9	49.5	49.5
Actuated g/C Ratio	0.26	0.26	0.62	0.62
v/c Ratio	0.90	0.85	0.90	0.69
Control Delay	43.7	49.9	17.2	11.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	43.7	49.9	17.2	11.2
LOS	D	D	B	B
Approach Delay	45.5		17.2	11.2
Approach LOS	D		B	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 79.4	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 19.1	Intersection LOS: B
Intersection Capacity Utilization 82.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	772	323	3595	2771
v/c Ratio	0.90	0.85	0.90	0.69
Control Delay	43.7	49.9	17.2	11.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	43.7	49.9	17.2	11.2
Queue Length 50th (ft)	190	165	406	241
Queue Length 95th (ft)	#291	#319	472	282
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	880	391	3993	3993
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.88	0.83	0.90	0.69

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	707	345	0	3451	2660	0
Future Volume (veh/h)	707	345	0	3451	2660	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1772	1870	0	1870	1870	0
Adj Flow Rate, veh/h	736	359	0	3595	2771	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	869	408	0	4041	4041	0
Arrive On Green	0.26	0.26	0.00	0.63	0.63	0.00
Sat Flow, veh/h	3375	1585	0	6958	6958	0
Grp Volume(v), veh/h	736	359	0	3595	2771	0
Grp Sat Flow(s),veh/h/ln	1688	1585	0	1609	1609	0
Q Serve(g_s), s	16.3	17.1	0.0	37.1	22.1	0.0
Cycle Q Clear(g_c), s	16.3	17.1	0.0	37.1	22.1	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	869	408	0	4041	4041	0
V/C Ratio(X)	0.85	0.88	0.00	0.89	0.69	0.00
Avail Cap(c_a), veh/h	922	433	0	4048	4048	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.7	28.0	0.0	12.3	9.6	0.0
Incr Delay (d2), s/veh	7.1	17.8	0.0	2.8	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	8.2	0.0	11.5	6.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	34.8	45.8	0.0	15.1	10.0	0.0
LnGrp LOS	C	D	A	B	B	A
Approach Vol, veh/h	1095			3595	2771	
Approach Delay, s/veh	38.4			15.1	10.0	
Approach LOS	D			B	B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		53.9		24.8		53.9
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		49.5		21.5		49.5
Max Q Clear Time (g_c+I1), s		39.1		19.1		24.1
Green Ext Time (p_c), s		10.4		1.2		22.8

Intersection Summary	
HCM 6th Ctrl Delay	16.7
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1700	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3072	1583	3072	6408	6408	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3072	1583	3072	6408	6408	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		1				28
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	718	283	456	1688	1425	787
Future Volume (vph)	718	283	456	1688	1425	787
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	740	292	470	1740	1469	811
Shared Lane Traffic (%)						
Lane Group Flow (vph)	740	292	470	1740	1469	811

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	718	283	456	1688	1425	787
Future Volume (vph)	718	283	456	1688	1425	787
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	22.5	14.9	14.9	37.5	22.6	22.5
Total Split (%)	37.5%	24.8%	24.8%	62.5%	37.7%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	17.6	32.5	10.4	33.0	18.1	40.2
Actuated g/C Ratio	0.30	0.55	0.17	0.55	0.30	0.67
v/c Ratio	0.82	0.34	0.88	0.49	0.75	0.75
Control Delay	28.7	8.9	44.9	8.8	21.8	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.7	8.9	44.9	8.8	21.8	12.0
LOS	C	A	D	A	C	B
Approach Delay	23.1			16.5	18.3	
Approach LOS	C			B	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 59.6	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 18.5	Intersection LOS: B
Intersection Capacity Utilization 70.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	740	292	470	1740	1469	811
v/c Ratio	0.82	0.34	0.88	0.49	0.75	0.75
Control Delay	28.7	8.9	44.9	8.8	21.8	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.7	8.9	44.9	8.8	21.8	12.0
Queue Length 50th (ft)	125	52	86	101	138	147
Queue Length 95th (ft)	#207	95	#162	127	176	286
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	927	863	536	3548	1946	1087
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.34	0.88	0.49	0.75	0.75

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

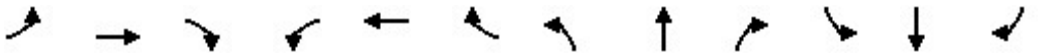
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	718	283	456	1688	1425	787
Future Volume (veh/h)	718	283	456	1688	1425	787
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1870	1673	1870	1870	1870
Adj Flow Rate, veh/h	740	292	470	1740	1469	811
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	870	728	550	3632	1992	937
Arrive On Green	0.28	0.28	0.18	0.56	0.31	0.31
Sat Flow, veh/h	3092	1585	3092	6696	6696	1585
Grp Volume(v), veh/h	740	292	470	1740	1469	811
Grp Sat Flow(s),veh/h/ln	1546	1585	1546	1609	1609	1585
Q Serve(g_s), s	13.2	7.1	8.6	9.4	11.9	18.1
Cycle Q Clear(g_c), s	13.2	7.1	8.6	9.4	11.9	18.1
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	870	728	550	3632	1992	937
V/C Ratio(X)	0.85	0.40	0.85	0.48	0.74	0.87
Avail Cap(c_a), veh/h	952	770	550	3632	1992	937
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	10.5	23.3	7.6	18.1	8.6
Incr Delay (d2), s/veh	6.9	0.4	12.5	0.1	1.5	8.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	7.4	3.8	2.5	4.2	13.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.8	10.8	35.7	7.7	19.5	17.1
LnGrp LOS	C	B	D	A	B	B
Approach Vol, veh/h	1032			2210	2280	
Approach Delay, s/veh	22.2			13.7	18.7	
Approach LOS	C			B	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		37.5		21.0	14.9	22.6
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		33.0		18.0	10.4	18.1
Max Q Clear Time (g_c+I1), s		11.4		15.2	10.6	20.1
Green Ext Time (p_c), s		13.7		1.2	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	17.3
HCM 6th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.963				0.850			0.850		0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	4897	0	3072	3539	1583	3072	5085	1583	3072	6344	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	4897	0	3072	3539	1583	3072	5085	1583	3072	6344	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		76				252			262		15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



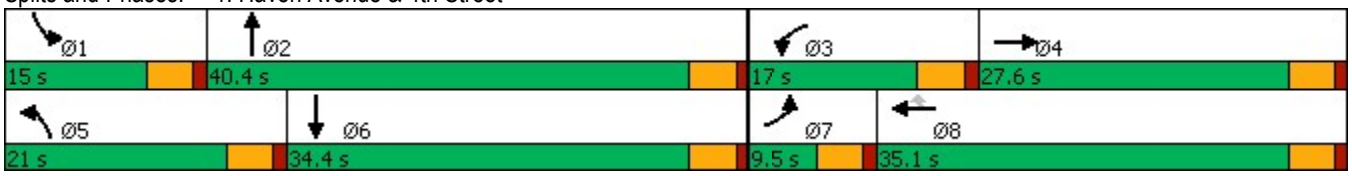
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	73	772	250	327	733	237	306	1607	506	246	1562	111
Future Volume (vph)	73	772	250	327	733	237	306	1607	506	246	1562	111
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	78	821	266	348	780	252	326	1710	538	262	1662	118
Shared Lane Traffic (%)												
Lane Group Flow (vph)	78	1087	0	348	780	252	326	1710	538	262	1780	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	73	772	327	733	237	306	1607	506	246	1562
Future Volume (vph)	73	772	327	733	237	306	1607	506	246	1562
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	9.5	27.6	17.0	35.1	35.1	21.0	40.4		15.0	34.4
Total Split (%)	9.5%	27.6%	17.0%	35.1%	35.1%	21.0%	40.4%		15.0%	34.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	5.0	23.1	12.5	32.5	32.5	14.8	35.9	100.0	10.5	31.5
Actuated g/C Ratio	0.05	0.23	0.12	0.32	0.32	0.15	0.36	1.00	0.10	0.32
v/c Ratio	0.51	0.91	0.91	0.68	0.37	0.72	0.94	0.34	0.82	0.89
Control Delay	58.3	47.6	71.7	33.4	5.1	49.7	42.1	0.6	64.6	39.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.3	47.6	71.7	33.4	5.1	49.7	42.1	0.6	64.6	39.1
LOS	E	D	E	C	A	D	D	A	E	D
Approach Delay		48.3		37.9			34.4			42.4
Approach LOS		D		D			C			D

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 39.6	Intersection LOS: D
Intersection Capacity Utilization 84.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Haven Avenue & 4th Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	78	1087	348	780	252	326	1710	538	262	1780
v/c Ratio	0.51	0.91	0.91	0.68	0.37	0.72	0.94	0.34	0.82	0.89
Control Delay	58.3	47.6	71.7	33.4	5.1	49.7	42.1	0.6	64.6	39.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.3	47.6	71.7	33.4	5.1	49.7	42.1	0.6	64.6	39.1
Queue Length 50th (ft)	25	232	114	232	0	102	380	0	85	313
Queue Length 95th (ft)	50	#316	#197	301	55	147	#485	0	#150	#394
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	153	1189	384	1150	684	506	1825	1583	322	2011
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.91	0.91	0.68	0.37	0.64	0.94	0.34	0.81	0.89

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

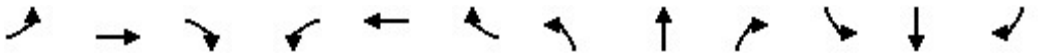
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	772	250	327	733	237	306	1607	506	246	1562	111
Future Volume (veh/h)	73	772	250	327	733	237	306	1607	506	246	1562	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	78	821	266	348	780	252	326	1710	0	262	1662	118
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	137	885	285	387	1110	495	394	1837		319	2072	147
Arrive On Green	0.04	0.23	0.23	0.13	0.31	0.31	0.13	0.36	0.00	0.10	0.34	0.34
Sat Flow, veh/h	3092	3823	1230	3092	3554	1585	3092	5106	1585	3092	6178	439
Grp Volume(v), veh/h	78	730	357	348	780	252	326	1710	0	262	1298	482
Grp Sat Flow(s),veh/h/ln	1546	1702	1649	1546	1777	1585	1546	1702	1585	1546	1609	1791
Q Serve(g_s), s	2.5	21.0	21.2	11.1	19.3	13.0	10.3	32.2	0.0	8.3	24.4	24.4
Cycle Q Clear(g_c), s	2.5	21.0	21.2	11.1	19.3	13.0	10.3	32.2	0.0	8.3	24.4	24.4
Prop In Lane	1.00		0.75	1.00		1.00	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	137	788	382	387	1110	495	394	1837		319	1618	601
V/C Ratio(X)	0.57	0.93	0.93	0.90	0.70	0.51	0.83	0.93		0.82	0.80	0.80
Avail Cap(c_a), veh/h	155	788	382	387	1110	495	511	1837		325	1618	601
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.8	37.5	37.6	43.0	30.2	28.1	42.5	30.8	0.0	43.8	30.2	30.2
Incr Delay (d2), s/veh	3.8	17.0	29.9	23.0	2.0	0.9	8.5	10.0	0.0	15.1	4.3	10.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	10.4	11.6	5.4	8.4	5.0	4.3	14.4	0.0	3.8	9.8	12.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.5	54.5	67.5	66.1	32.2	28.9	50.9	40.8	0.0	59.0	34.4	41.0
LnGrp LOS	D	D	E	E	C	C	D	D		E	C	D
Approach Vol, veh/h		1165			1380			2036	A		2042	
Approach Delay, s/veh		58.2			40.2			42.4			39.1	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.8	40.4	17.0	27.6	17.2	38.0	8.9	35.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	35.9	12.5	23.1	16.5	29.9	5.0	30.6
Max Q Clear Time (g_c+I1), s	10.3	34.2	13.1	23.2	12.3	26.4	4.5	21.3
Green Ext Time (p_c), s	0.0	1.5	0.0	0.0	0.5	2.9	0.0	4.2

Intersection Summary	
HCM 6th Ctrl Delay	43.7
HCM 6th LOS	D

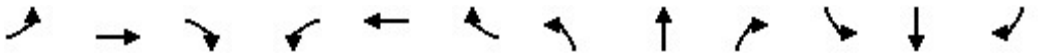
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.999				0.850			0.850		0.850	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	1765	6401	0	1676	5085	1583	1765	1863	1583	1676	3008	0
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	1765	6401	0	1676	5085	1583	1765	1863	1583	1676	3008	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				176			200		391	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



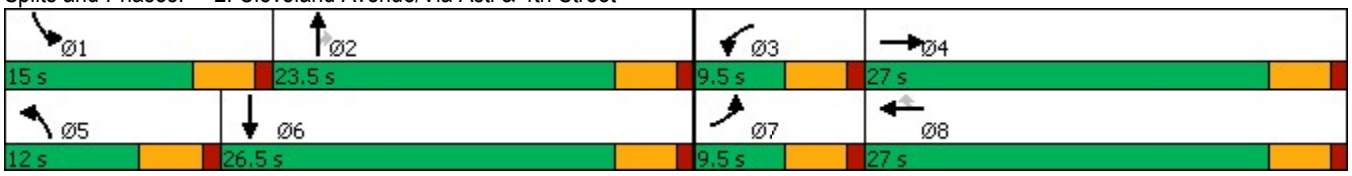
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	1639	6	4	1278	177	0	0	6	174	0	1
Future Volume (vph)	0	1639	6	4	1278	177	0	0	6	174	0	1
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1690	6	4	1318	182	0	0	6	179	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1696	0	4	1318	182	0	0	6	179	1	0

Intersection Summary

Lane Group	EBT	WBL	WBT	WBR	NBR	SBL	SBT	Ø5	Ø7
Lane Configurations									
Traffic Volume (vph)	1639	4	1278	177	6	174	0		
Future Volume (vph)	1639	4	1278	177	6	174	0		
Turn Type	NA	Prot	NA	Perm	Perm	Prot	NA		
Protected Phases	4	3	8			1	6	5	7
Permitted Phases				8	2				
Detector Phase	4	3	8	8	2	1	6		
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	22.5	22.5	22.5	9.5	22.5	9.5	9.5
Total Split (s)	27.0	9.5	27.0	27.0	23.5	15.0	26.5	12.0	9.5
Total Split (%)	36.0%	12.7%	36.0%	36.0%	31.3%	20.0%	35.3%	16%	13%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		
Lead/Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	None	Min	None	None
Act Effct Green (s)	22.6	5.0	24.3	24.3	5.5	9.9	20.0		
Actuated g/C Ratio	0.42	0.09	0.46	0.46	0.10	0.19	0.38		
v/c Ratio	0.62	0.03	0.57	0.22	0.02	0.57	0.00		
Control Delay	13.9	24.5	11.8	2.5	0.2	29.5	0.0		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	13.9	24.5	11.8	2.5	0.2	29.5	0.0		
LOS	B	C	B	A	A	C	A		
Approach Delay	13.9		10.7				29.3		
Approach LOS	B		B				C		

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 53.3	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 13.3	Intersection LOS: B
Intersection Capacity Utilization 49.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street



Lane Group	EBT	WBL	WBT	WBR	NBR	SBL	SBT
Lane Group Flow (vph)	1696	4	1318	182	6	179	1
v/c Ratio	0.62	0.03	0.57	0.22	0.02	0.57	0.00
Control Delay	13.9	24.5	11.8	2.5	0.2	29.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.9	24.5	11.8	2.5	0.2	29.5	0.0
Queue Length 50th (ft)	109	1	106	1	0	49	0
Queue Length 95th (ft)	192	9	139	25	0	#135	0
Internal Link Dist (ft)	2546		362				358
Turn Bay Length (ft)		130		145	165	50	
Base Capacity (vph)	2717	158	2315	816	695	332	1477
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.03	0.57	0.22	0.01	0.54	0.00

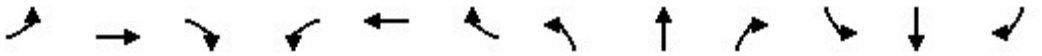
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1639	6	4	1278	177	0	0	6	174	0	1
Future Volume (veh/h)	0	1639	6	4	1278	177	0	0	6	174	0	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1870	1870	1772	1870	1870	1772	1870	1870	1772	1870	1870
Adj Flow Rate, veh/h	0	1690	6	4	1318	182	0	0	6	179	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	3	2639	9	9	2513	780	3	189	160	226	579	516
Arrive On Green	0.00	0.40	0.40	0.01	0.49	0.49	0.00	0.00	0.10	0.13	0.00	0.33
Sat Flow, veh/h	1688	6668	24	1688	5106	1585	1688	1870	1585	1688	1777	1585
Grp Volume(v), veh/h	0	1223	473	4	1318	182	0	0	6	179	0	1
Grp Sat Flow(s),veh/h/ln	1688	1609	1866	1688	1702	1585	1688	1870	1585	1688	1777	1585
Q Serve(g_s), s	0.0	10.1	10.1	0.1	8.7	3.3	0.0	0.0	0.2	5.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	10.1	10.1	0.1	8.7	3.3	0.0	0.0	0.2	5.1	0.0	0.0
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	3	1910	738	9	2513	780	3	189	160	226	579	516
V/C Ratio(X)	0.00	0.64	0.64	0.44	0.52	0.23	0.00	0.00	0.04	0.79	0.00	0.00
Avail Cap(c_a), veh/h	171	2196	849	171	2513	780	256	719	609	358	791	705
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.1	12.1	24.5	8.6	7.2	0.0	0.0	20.1	20.8	0.0	11.2
Incr Delay (d2), s/veh	0.0	0.5	1.3	29.8	0.2	0.2	0.0	0.0	0.1	6.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.0	3.7	0.1	2.5	0.9	0.0	0.0	0.1	2.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	12.6	13.4	54.3	8.8	7.4	0.0	0.0	20.1	27.0	0.0	11.2
LnGrp LOS	A	B	B	D	A	A	A	A	C	C	A	B
Approach Vol, veh/h		1696			1504			6			180	
Approach Delay, s/veh		12.8			8.7			20.1			26.9	
Approach LOS		B			A			C			C	

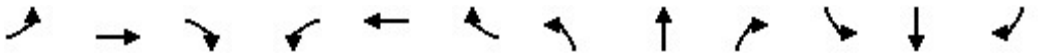
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.1	9.5	4.8	24.1	0.0	20.6	0.0	28.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	19.0	5.0	22.5	7.5	22.0	5.0	22.5
Max Q Clear Time (g_c+I1), s	7.1	2.2	2.1	12.1	0.0	2.0	0.0	10.7
Green Ext Time (p_c), s	0.1	0.0	0.0	7.4	0.0	0.0	0.0	7.4

Intersection Summary	
HCM 6th Ctrl Delay	11.8
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1800	1900	1900	1800	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.992				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.953	
Satd. Flow (prot)	3072	6401	0	1676	5045	0	1676	1863	1583	0	1775	1583
Flt Permitted	0.950			0.950			0.712				0.729	
Satd. Flow (perm)	3072	6401	0	1676	5045	0	1256	1863	1583	0	1358	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			15				218			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



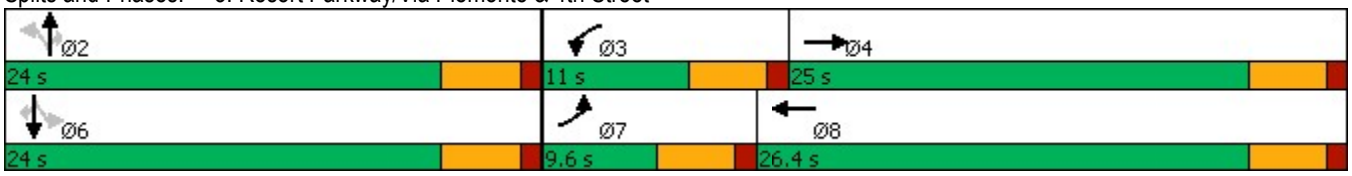
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	16	1611	12	7	1238	66	4	0	12	66	1	22
Future Volume (vph)	16	1611	12	7	1238	66	4	0	12	66	1	22
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	16	1661	12	7	1276	68	4	0	12	68	1	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	1673	0	7	1344	0	4	0	12	0	69	23

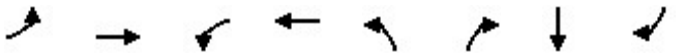
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	16	1611	7	1238	4	12	66	1	22
Future Volume (vph)	16	1611	7	1238	4	12	66	1	22
Turn Type	Prot	NA	Prot	NA	Perm	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8				6	
Permitted Phases					2	2	6		6
Detector Phase	7	4	3	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.6	25.0	11.0	26.4	24.0	24.0	24.0	24.0	24.0
Total Split (%)	16.0%	41.7%	18.3%	44.0%	40.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min
Act Effct Green (s)	5.2	20.7	5.8	20.9	7.4	7.4		7.4	7.4
Actuated g/C Ratio	0.13	0.53	0.15	0.54	0.19	0.19		0.19	0.19
v/c Ratio	0.04	0.49	0.03	0.50	0.02	0.03		0.27	0.06
Control Delay	18.2	7.4	17.6	7.3	14.8	0.1		17.8	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	18.2	7.4	17.6	7.3	14.8	0.1		17.8	0.3
LOS	B	A	B	A	B	A		B	A
Approach Delay		7.5		7.4				13.4	
Approach LOS		A		A				B	

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 39			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.50			
Intersection Signal Delay: 7.6		Intersection LOS: A	
Intersection Capacity Utilization 45.0%		ICU Level of Service A	
Analysis Period (min) 15			

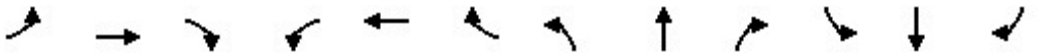
Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street





Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBT	SBR
Lane Group Flow (vph)	16	1673	7	1344	4	12	69	23
v/c Ratio	0.04	0.49	0.03	0.50	0.02	0.03	0.27	0.06
Control Delay	18.2	7.4	17.6	7.3	14.8	0.1	17.8	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.2	7.4	17.6	7.3	14.8	0.1	17.8	0.3
Queue Length 50th (ft)	1	45	1	46	1	0	12	0
Queue Length 95th (ft)	9	144	11	145	7	0	45	0
Internal Link Dist (ft)		362		428			378	
Turn Bay Length (ft)	220		125		115	115		110
Base Capacity (vph)	410	3518	285	2904	642	916	694	862
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.48	0.02	0.46	0.01	0.01	0.10	0.03

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	1611	12	7	1238	66	4	0	12	66	1	22
Future Volume (veh/h)	16	1611	12	7	1238	66	4	0	12	66	1	22
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1772	1870	1870	1772	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	16	1661	12	7	1276	68	4	0	12	68	1	23
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	64	3115	23	16	2273	121	330	264	223	396	4	223
Arrive On Green	0.02	0.47	0.47	0.01	0.46	0.46	0.14	0.00	0.14	0.14	0.14	0.14
Sat Flow, veh/h	3092	6639	48	1688	4962	264	1314	1870	1585	1379	31	1585
Grp Volume(v), veh/h	16	1207	466	7	875	469	4	0	12	69	0	23
Grp Sat Flow(s),veh/h/ln	1546	1609	1862	1688	1702	1823	1314	1870	1585	1410	0	1585
Q Serve(g_s), s	0.2	6.3	6.3	0.1	6.7	6.7	0.1	0.0	0.2	1.5	0.0	0.4
Cycle Q Clear(g_c), s	0.2	6.3	6.3	0.1	6.7	6.7	1.7	0.0	0.2	1.6	0.0	0.4
Prop In Lane	1.00		0.03	1.00		0.15	1.00		1.00	0.99		1.00
Lane Grp Cap(c), veh/h	64	2264	874	16	1559	835	330	264	223	400	0	223
V/C Ratio(X)	0.25	0.53	0.53	0.44	0.56	0.56	0.01	0.00	0.05	0.17	0.00	0.10
Avail Cap(c_a), veh/h	444	2788	1076	309	2101	1125	867	1028	871	975	0	871
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.1	6.7	6.7	17.5	7.0	7.0	14.5	0.0	13.2	13.8	0.0	13.3
Incr Delay (d2), s/veh	2.0	0.2	0.5	18.1	0.3	0.6	0.0	0.0	0.1	0.2	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.3	1.6	0.1	1.5	1.7	0.0	0.0	0.1	0.4	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.2	6.9	7.2	35.6	7.3	7.6	14.5	0.0	13.3	14.0	0.0	13.5
LnGrp LOS	B	A	A	D	A	A	B	A	B	B	A	B
Approach Vol, veh/h		1689			1351			16			92	
Approach Delay, s/veh		7.1			7.6			13.6			13.8	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	4.8	21.2		9.5	5.2	20.8				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		19.5	6.5	20.5		19.5	5.1	21.9				
Max Q Clear Time (g_c+I1), s		3.7	2.1	8.3		3.6	2.2	8.7				
Green Ext Time (p_c), s		0.0	0.0	8.4		0.3	0.0	7.4				

Intersection Summary	
HCM 6th Ctrl Delay	7.5
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.991					0.865
Flt Protected						
Satd. Flow (prot)	5040	0	0	5085	0	1611
Flt Permitted						
Satd. Flow (perm)	5040	0	0	5085	0	1611
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	1584	105	0	1340	0	22
Future Volume (vph)	1584	105	0	1340	0	22
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1667	111	0	1411	0	23
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1778	0	0	1411	0	23

Intersection Summary

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1584	105	0	1340	0	22
Future Vol, veh/h	1584	105	0	1340	0	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1667	111	0	1411	0	23

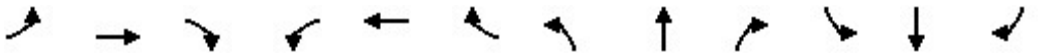
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	889
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	246
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	246
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	21.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	246	-	-	-
HCM Lane V/C Ratio	0.094	-	-	-
HCM Control Delay (s)	21.1	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.3	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.977	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	5085	1583	3072	5085	1583	3072	6408	1583	3072	6260	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	5085	1583	3072	5085	1583	3072	6408	1583	3072	6260	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			246			294			95		37	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



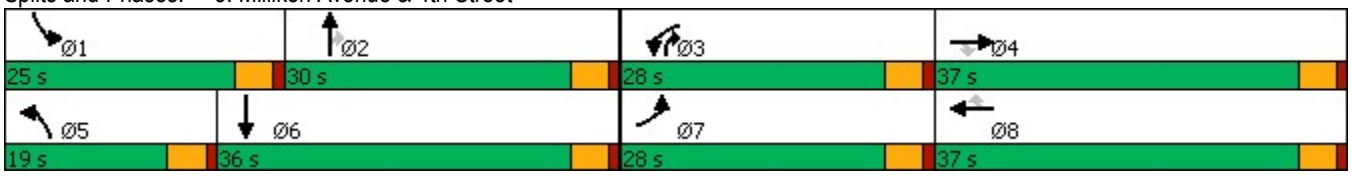
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	383	1285	403	739	927	389	328	1195	510	546	1155	213
Future Volume (vph)	383	1285	403	739	927	389	328	1195	510	546	1155	213
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	403	1353	424	778	976	409	345	1258	537	575	1216	224
Shared Lane Traffic (%)												
Lane Group Flow (vph)	403	1353	424	778	976	409	345	1258	537	575	1440	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	383	1285	403	739	927	389	328	1195	510	546	1155
Future Volume (vph)	383	1285	403	739	927	389	328	1195	510	546	1155
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	28.0	37.0	37.0	28.0	37.0	37.0	19.0	30.0	28.0	25.0	36.0
Total Split (%)	23.3%	30.8%	30.8%	23.3%	30.8%	30.8%	15.8%	25.0%	23.3%	20.8%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	20.3	32.5	32.5	23.5	35.7	35.7	14.5	25.5	53.5	20.5	31.5
Actuated g/C Ratio	0.17	0.27	0.27	0.20	0.30	0.30	0.12	0.21	0.45	0.17	0.26
v/c Ratio	0.78	0.98	0.70	1.29	0.65	0.60	0.93	0.92	0.71	1.10	0.86
Control Delay	58.2	64.1	22.8	183.9	39.5	14.7	84.5	58.4	27.9	114.8	47.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.2	64.1	22.8	183.9	39.5	14.7	84.5	58.4	27.9	114.8	47.4
LOS	E	E	C	F	D	B	F	E	C	F	D
Approach Delay		55.0			86.8			55.0			66.6
Approach LOS		D			F			D			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.29	
Intersection Signal Delay: 65.8	Intersection LOS: E
Intersection Capacity Utilization 98.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 5: Milliken Avenue & 4th Street

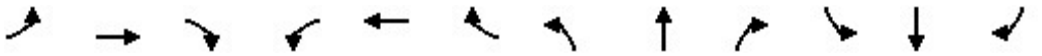


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	403	1353	424	778	976	409	345	1258	537	575	1440
v/c Ratio	0.78	0.98	0.70	1.29	0.65	0.60	0.93	0.92	0.71	1.10	0.86
Control Delay	58.2	64.1	22.8	183.9	39.5	14.7	84.5	58.4	27.9	114.8	47.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.2	64.1	22.8	183.9	39.5	14.7	84.5	58.4	27.9	114.8	47.4
Queue Length 50th (ft)	154	382	124	~396	242	69	138	279	275	~259	302
Queue Length 95th (ft)	205	#488	247	#519	301	185	#228	#346	414	#373	350
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	601	1377	608	601	1512	677	371	1361	758	524	1670
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.98	0.70	1.29	0.65	0.60	0.93	0.92	0.71	1.10	0.86

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



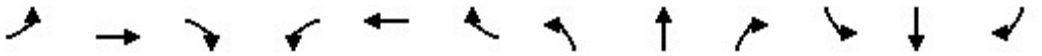
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	383	1285	403	739	927	389	328	1195	510	546	1155	213
Future Volume (veh/h)	383	1285	403	739	927	389	328	1195	510	546	1155	213
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	403	1353	424	778	976	409	345	1258	537	575	1216	224
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	466	1383	429	606	1613	501	374	1367	647	528	1445	265
Arrive On Green	0.15	0.27	0.27	0.20	0.32	0.32	0.12	0.21	0.21	0.17	0.26	0.26
Sat Flow, veh/h	3092	5106	1585	3092	5106	1585	3092	6434	1585	3092	5506	1008
Grp Volume(v), veh/h	403	1353	424	778	976	409	345	1258	537	575	1065	375
Grp Sat Flow(s),veh/h/ln	1546	1702	1585	1546	1702	1585	1546	1609	1585	1546	1609	1689
Q Serve(g_s), s	15.3	31.5	32.0	23.5	19.4	28.5	13.3	23.0	25.5	20.5	25.1	25.3
Cycle Q Clear(g_c), s	15.3	31.5	32.0	23.5	19.4	28.5	13.3	23.0	25.5	20.5	25.1	25.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.60
Lane Grp Cap(c), veh/h	466	1383	429	606	1613	501	374	1367	647	528	1267	443
V/C Ratio(X)	0.86	0.98	0.99	1.28	0.60	0.82	0.92	0.92	0.83	1.09	0.84	0.85
Avail Cap(c_a), veh/h	606	1383	429	606	1613	501	374	1367	647	528	1267	443
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.8	43.4	43.6	48.3	34.7	37.8	52.2	46.3	31.8	49.8	41.9	42.0
Incr Delay (d2), s/veh	10.1	19.2	40.1	140.4	0.6	10.2	28.1	10.3	8.9	65.4	5.2	14.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	15.6	17.2	20.8	8.1	12.4	6.6	10.1	15.3	12.7	10.5	12.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.9	62.6	83.6	188.7	35.4	48.0	80.3	56.6	40.7	115.1	47.1	56.0
LnGrp LOS	E	E	F	F	D	D	F	E	D	F	D	E
Approach Vol, veh/h		2180			2163			2140			2015	
Approach Delay, s/veh		66.2			92.9			56.4			68.2	
Approach LOS		E			F			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.0	30.0	28.0	37.0	19.0	36.0	22.6	42.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	20.5	25.5	23.5	32.5	14.5	31.5	23.5	32.5
Max Q Clear Time (g_c+I1), s	22.5	27.5	25.5	34.0	15.3	27.3	17.3	30.5
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	3.1	0.8	1.4

Intersection Summary	
HCM 6th Ctrl Delay	71.0
HCM 6th LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1800	1900	1900	1800	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.947	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	5085	1583	3072	5085	1583	1676	3539	1583	1676	3211	1441
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	5085	1583	3072	5085	1583	1676	3539	1583	1676	3211	1441
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			128			224			354		80	397
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



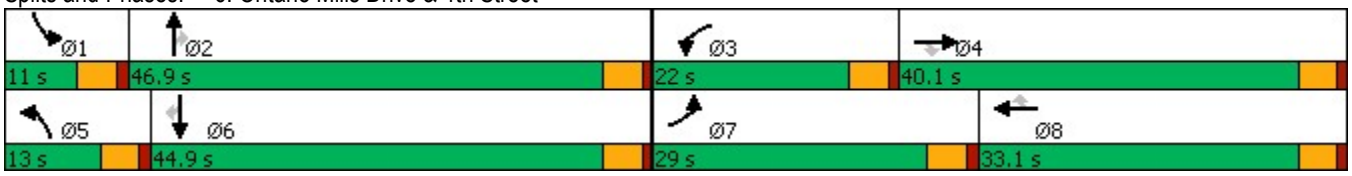
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1023	1495	219	574	1232	589	255	446	683	110	884	1085
Future Volume (vph)	1023	1495	219	574	1232	589	255	446	683	110	884	1085
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1066	1557	228	598	1283	614	266	465	711	115	921	1130
Shared Lane Traffic (%)												44%
Lane Group Flow (vph)	1066	1557	228	598	1283	614	266	465	711	115	1418	633

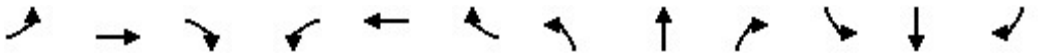
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1023	1495	219	574	1232	589	255	446	683	110	884	1085
Future Volume (vph)	1023	1495	219	574	1232	589	255	446	683	110	884	1085
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	29.0	40.1	40.1	22.0	33.1	33.1	13.0	46.9	46.9	11.0	44.9	44.9
Total Split (%)	24.2%	33.4%	33.4%	18.3%	27.6%	27.6%	10.8%	39.1%	39.1%	9.2%	37.4%	37.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	24.5	35.6	35.6	17.5	28.6	28.6	8.5	42.4	42.4	6.5	40.4	40.4
Actuated g/C Ratio	0.20	0.30	0.30	0.15	0.24	0.24	0.07	0.35	0.35	0.05	0.34	0.34
v/c Ratio	1.70	1.03	0.41	1.33	1.06	1.12	2.25	0.37	0.90	1.28	1.25	0.85
Control Delay	352.9	73.5	16.9	205.3	87.1	104.2	616.4	30.0	34.4	231.7	153.4	25.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	352.9	73.5	16.9	205.3	87.1	104.2	616.4	30.0	34.4	231.7	153.4	25.3
LOS	F	E	B	F	F	F	F	C	C	F	F	C
Approach Delay		173.4			119.6			140.3			120.1	
Approach LOS		F			F			F			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 2.25	
Intersection Signal Delay: 140.2	Intersection LOS: F
Intersection Capacity Utilization 122.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 6: Ontario Mills Drive & 4th Street



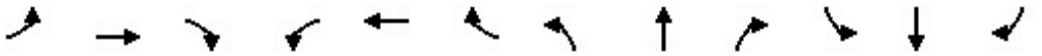


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1066	1557	228	598	1283	614	266	465	711	115	1418	633
v/c Ratio	1.70	1.03	0.41	1.33	1.06	1.12	2.25	0.37	0.90	1.28	1.25	0.85
Control Delay	352.9	73.5	16.9	205.3	87.1	104.2	616.4	30.0	34.4	231.7	153.4	25.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	352.9	73.5	16.9	205.3	87.1	104.2	616.4	30.0	34.4	231.7	153.4	25.3
Queue Length 50th (ft)	~625	~473	58	~310	~399	~408	~333	140	296	~112	~733	204
Queue Length 95th (ft)	#756	#571	131	#425	#495	#636	#504	186	#556	#235	#880	#468
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	627	1508	559	448	1211	547	118	1250	788	90	1134	748
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.70	1.03	0.41	1.33	1.06	1.12	2.25	0.37	0.90	1.28	1.25	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



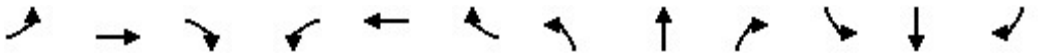
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1023	1495	219	574	1232	589	255	446	683	110	884	1085
Future Volume (veh/h)	1023	1495	219	574	1232	589	255	446	683	110	884	1085
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1772	1870	1870	1772	1870	1870
Adj Flow Rate, veh/h	1066	1557	228	598	1283	614	266	465	711	115	907	1139
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	631	1515	470	451	1217	378	120	1256	560	91	630	1067
Arrive On Green	0.20	0.30	0.30	0.15	0.24	0.24	0.07	0.35	0.35	0.05	0.34	0.34
Sat Flow, veh/h	3092	5106	1585	3092	5106	1585	1688	3554	1585	1688	1870	3170
Grp Volume(v), veh/h	1066	1557	228	598	1283	614	266	465	711	115	907	1139
Grp Sat Flow(s),veh/h/ln	1546	1702	1585	1546	1702	1585	1688	1777	1585	1688	1870	1585
Q Serve(g_s), s	24.5	35.6	14.2	17.5	28.6	28.6	8.5	11.7	42.4	6.5	40.4	40.4
Cycle Q Clear(g_c), s	24.5	35.6	14.2	17.5	28.6	28.6	8.5	11.7	42.4	6.5	40.4	40.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	631	1515	470	451	1217	378	120	1256	560	91	630	1067
V/C Ratio(X)	1.69	1.03	0.48	1.33	1.05	1.63	2.23	0.37	1.27	1.26	1.44	1.07
Avail Cap(c_a), veh/h	631	1515	470	451	1217	378	120	1256	560	91	630	1067
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.8	42.2	34.7	51.2	45.7	45.7	55.7	28.9	38.8	56.8	39.8	39.8
Incr Delay (d2), s/veh	316.7	30.5	0.8	161.5	41.4	293.3	577.5	0.2	134.9	178.6	207.1	47.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	37.1	19.0	5.6	16.9	16.6	41.9	22.8	5.0	37.1	7.3	54.5	22.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	364.5	72.7	35.4	212.8	87.1	339.0	633.2	29.1	173.7	235.3	246.9	87.2
LnGrp LOS	F	F	D	F	F	F	F	C	F	F	F	F
Approach Vol, veh/h		2851			2495			1442			2161	
Approach Delay, s/veh		178.8			179.2			211.8			162.1	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	46.9	22.0	40.1	13.0	44.9	29.0	33.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	42.4	17.5	35.6	8.5	40.4	24.5	28.6
Max Q Clear Time (g_c+I1), s	8.5	44.4	19.5	37.6	10.5	42.4	26.5	30.6
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	180.2
HCM 6th LOS	F

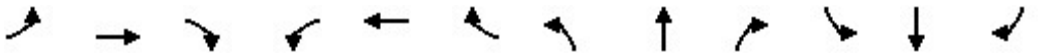
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.981			0.939				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.987	
Satd. Flow (prot)	3072	5085	1583	1676	4989	0	1676	3323	0	1593	1747	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.987	
Satd. Flow (perm)	3072	5085	1583	1676	4989	0	1676	3323	0	1593	1747	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			138		19			70				298
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



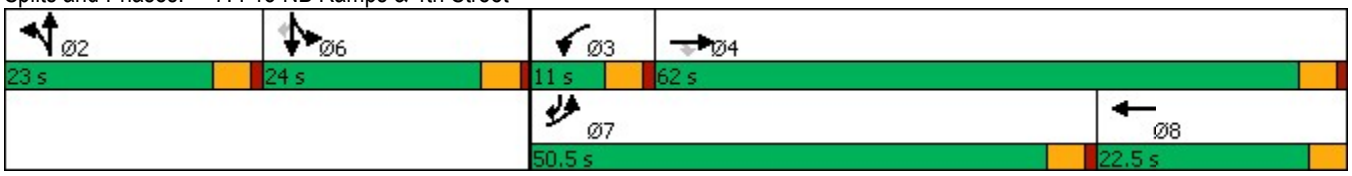
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1420	669	130	45	745	107	133	95	66	175	106	1588
Future Volume (vph)	1420	669	130	45	745	107	133	95	66	175	106	1588
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1511	712	138	48	793	114	141	101	70	186	113	1689
Shared Lane Traffic (%)										21%		
Lane Group Flow (vph)	1511	712	138	48	907	0	141	171	0	147	152	1689

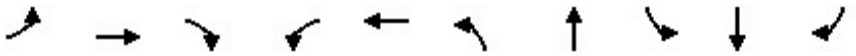
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	1420	669	130	45	745	133	95	175	106	1588
Future Volume (vph)	1420	669	130	45	745	133	95	175	106	1588
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	50.5	62.0	62.0	11.0	22.5	23.0	23.0	24.0	24.0	50.5
Total Split (%)	42.1%	51.7%	51.7%	9.2%	18.8%	19.2%	19.2%	20.0%	20.0%	42.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	46.2	60.2	60.2	6.3	19.1	14.1	14.1	15.0	15.0	65.7
Actuated g/C Ratio	0.41	0.54	0.54	0.06	0.17	0.13	0.13	0.13	0.13	0.59
v/c Ratio	1.19	0.26	0.15	0.51	1.04	0.67	0.35	0.69	0.65	1.01
Control Delay	123.6	15.6	3.2	72.4	86.9	62.5	28.2	63.7	59.7	43.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	123.6	15.6	3.2	72.4	86.9	62.5	28.2	63.7	59.7	43.5
LOS	F	B	A	E	F	E	C	E	E	D
Approach Delay		84.0			86.2		43.7		46.2	
Approach LOS		F			F		D		D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 111.5	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 68.7	Intersection LOS: E
Intersection Capacity Utilization 94.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street



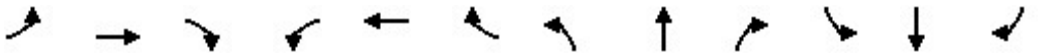


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1511	712	138	48	907	141	171	147	152	1689
v/c Ratio	1.19	0.26	0.15	0.51	1.04	0.67	0.35	0.69	0.65	1.01
Control Delay	123.6	15.6	3.2	72.4	86.9	62.5	28.2	63.7	59.7	43.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	123.6	15.6	3.2	72.4	86.9	62.5	28.2	63.7	59.7	43.5
Queue Length 50th (ft)	~684	102	0	34	~258	98	34	107	110	~609
Queue Length 95th (ft)	#902	147	34	#86	#385	171	70	185	189	#878
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	1273	2746	918	98	869	279	612	279	306	1678
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.19	0.26	0.15	0.49	1.04	0.51	0.28	0.53	0.50	1.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1420	669	130	45	745	107	133	95	66	175	106	1588
Future Volume (veh/h)	1420	669	130	45	745	107	133	95	66	175	106	1588
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1772	1870	1870	1772	1870	1870	1772	1870	1772
Adj Flow Rate, veh/h	1511	712	138	48	793	114	141	101	70	150	164	1689
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1241	2712	842	60	748	107	179	220	141	287	318	1716
Arrive On Green	0.40	0.53	0.53	0.04	0.17	0.17	0.11	0.11	0.11	0.17	0.17	0.17
Sat Flow, veh/h	3092	5106	1585	1688	4514	645	1688	2076	1332	1688	1870	3003
Grp Volume(v), veh/h	1511	712	138	48	597	310	141	85	86	150	164	1689
Grp Sat Flow(s),veh/h/ln	1546	1702	1585	1688	1702	1754	1688	1777	1631	1688	1870	1502
Q Serve(g_s), s	46.0	8.7	5.1	3.2	19.0	19.0	9.3	5.2	5.7	9.3	9.1	19.5
Cycle Q Clear(g_c), s	46.0	8.7	5.1	3.2	19.0	19.0	9.3	5.2	5.7	9.3	9.1	19.5
Prop In Lane	1.00		1.00	1.00		0.37	1.00		0.82	1.00		1.00
Lane Grp Cap(c), veh/h	1241	2712	842	60	564	291	179	188	173	287	318	1716
V/C Ratio(X)	1.22	0.26	0.16	0.79	1.06	1.07	0.79	0.45	0.50	0.52	0.52	0.98
Avail Cap(c_a), veh/h	1241	2712	842	96	564	291	272	287	263	287	318	1716
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.3	14.6	13.8	54.8	47.8	47.8	50.0	48.1	48.4	43.3	43.3	24.1
Incr Delay (d2), s/veh	105.5	0.1	0.1	20.5	54.0	71.7	8.5	1.7	2.2	1.7	1.4	18.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	35.0	3.3	1.8	1.7	12.2	14.0	4.4	2.4	2.4	4.0	4.4	25.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	139.8	14.7	13.9	75.4	101.8	119.5	58.5	49.8	50.6	45.0	44.7	42.1
LnGrp LOS	F	B	B	E	F	F	E	D	D	D	D	D
Approach Vol, veh/h		2361			955			312			2003	
Approach Delay, s/veh		94.7			106.2			53.9			42.5	
Approach LOS		F			F			D			D	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	16.6	8.6	65.4	24.0	50.5	23.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	* 4.5
Max Green Setting (Gmax), s	18.5	6.5	57.5	19.5	46.0	* 19
Max Q Clear Time (g_c+I1), s	11.3	5.2	10.7	21.5	48.0	21.0
Green Ext Time (p_c), s	0.8	0.0	6.4	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	75.9
HCM 6th LOS	E

Notes

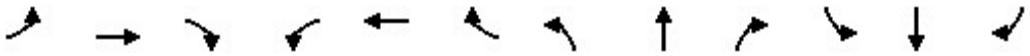
User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

User approved changes to right turn type.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1600	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.902				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3192	0	4202	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3192	0	4202	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		70				236			236			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



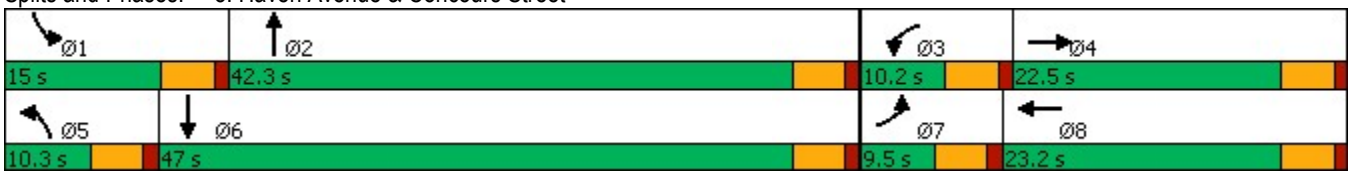
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	17	35	66	195	76	84	63	2219	280	274	2063	44
Future Volume (vph)	17	35	66	195	76	84	63	2219	280	274	2063	44
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	18	37	70	207	81	89	67	2361	298	291	2195	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	107	0	207	81	89	67	2361	298	291	2195	47

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	17	35	195	76	84	63	2219	280	274	2063	44
Future Volume (vph)	17	35	195	76	84	63	2219	280	274	2063	44
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	10.2	23.2		10.3	42.3		15.0	47.0	
Total Split (%)	10.6%	25.0%	11.3%	25.8%		11.4%	47.0%		16.7%	52.2%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.0	6.6	5.7	12.7	76.3	5.8	38.0	76.3	10.2	44.8	76.3
Actuated g/C Ratio	0.07	0.09	0.07	0.17	1.00	0.08	0.50	1.00	0.13	0.59	1.00
v/c Ratio	0.09	0.32	0.66	0.14	0.06	0.29	0.74	0.19	0.71	0.58	0.03
Control Delay	36.3	17.5	46.6	28.6	0.1	38.4	17.7	0.3	43.1	12.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	17.5	46.6	28.6	0.1	38.4	17.7	0.3	43.1	12.1	0.0
LOS	D	B	D	C	A	D	B	A	D	B	A
Approach Delay		20.2		31.8			16.3			15.5	
Approach LOS		C		C			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 76.3	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 17.1	Intersection LOS: B
Intersection Capacity Utilization 63.2%	ICU Level of Service B
Analysis Period (min) 15	

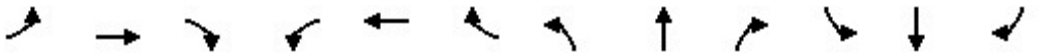
Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	18	107	207	81	89	67	2361	298	291	2195	47
v/c Ratio	0.09	0.32	0.66	0.14	0.06	0.29	0.74	0.19	0.71	0.58	0.03
Control Delay	36.3	17.5	46.6	28.6	0.1	38.4	17.7	0.3	43.1	12.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	17.5	46.6	28.6	0.1	38.4	17.7	0.3	43.1	12.1	0.0
Queue Length 50th (ft)	4	8	35	16	0	16	260	0	71	200	0
Queue Length 95th (ft)	14	32	#68	40	0	36	325	0	#126	254	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	202	809	315	871	1583	234	3188	1583	424	3760	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.13	0.66	0.09	0.06	0.29	0.74	0.19	0.69	0.58	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



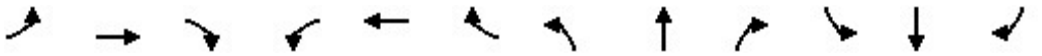
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	35	66	195	76	84	63	2219	280	274	2063	44
Future Volume (veh/h)	17	35	66	195	76	84	63	2219	280	274	2063	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1575	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	18	37	70	207	81	0	67	2361	0	291	2195	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	65	131	117	312	451		156	3140		373	3592	
Arrive On Green	0.02	0.07	0.07	0.07	0.13	0.00	0.05	0.49	0.00	0.12	0.56	0.00
Sat Flow, veh/h	3092	1777	1585	4230	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	18	37	70	207	81	0	67	2361	0	291	2195	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1410	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	0.4	1.5	3.2	3.5	1.5	0.0	1.6	21.9	0.0	6.8	16.9	0.0
Cycle Q Clear(g_c), s	0.4	1.5	3.2	3.5	1.5	0.0	1.6	21.9	0.0	6.8	16.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	65	131	117	312	451		156	3140		373	3592	
V/C Ratio(X)	0.28	0.28	0.60	0.66	0.18		0.43	0.75		0.78	0.61	
Avail Cap(c_a), veh/h	209	433	386	326	899		243	3290		439	3699	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.6	32.4	33.2	33.3	28.8	0.0	34.1	15.3	0.0	31.5	10.9	0.0
Incr Delay (d2), s/veh	2.3	1.2	4.8	4.7	0.2	0.0	1.9	1.0	0.0	7.5	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.7	1.3	1.3	0.6	0.0	0.6	7.3	0.0	2.8	5.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.9	33.5	38.0	38.0	29.0	0.0	35.9	16.3	0.0	39.0	11.2	0.0
LnGrp LOS	D	C	D	D	C		D	B		D	B	
Approach Vol, veh/h		125			288	A		2428	A		2486	A
Approach Delay, s/veh		36.6			35.5			16.8			14.5	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.4	40.6	10.0	10.0	8.2	45.8	6.0	13.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	37.8	5.7	18.0	5.8	42.5	5.0	18.7
Max Q Clear Time (g_c+I1), s	8.8	23.9	5.5	5.2	3.6	18.9	2.4	3.5
Green Ext Time (p_c), s	0.2	12.1	0.0	0.4	0.0	18.2	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	17.2
HCM 6th LOS	B

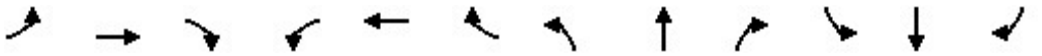
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1900	1900	1900	1900	1800	1900	1900	1800	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.945									0.990	
Flt Protected	0.950	0.969					0.950					
Satd. Flow (prot)	1593	1620	0	0	1863	0	1676	5085	0	1765	5034	0
Flt Permitted	0.950	0.969					0.950					
Satd. Flow (perm)	1593	1620	0	0	1863	0	1676	5085	0	1765	5034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		143									13	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



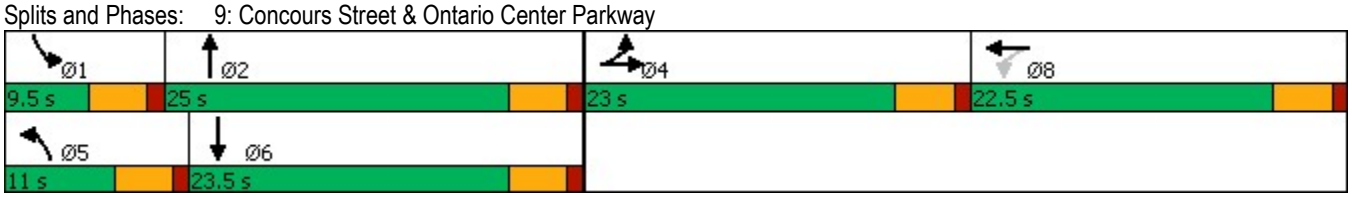
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	16	0	4	0	0	0	7	424	1	0	316	22
Future Volume (vph)	16	0	4	0	0	0	7	424	1	0	316	22
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	18	0	4	0	0	0	8	471	1	0	351	24
Shared Lane Traffic (%)	38%											
Lane Group Flow (vph)	11	11	0	0	0	0	8	472	0	0	375	0

Intersection Summary

Lane Group	EBL	EBT	NBL	NBT	SBT	Ø1	Ø8
Lane Configurations							
Traffic Volume (vph)	16	0	7	424	316		
Future Volume (vph)	16	0	7	424	316		
Turn Type	Split	NA	Prot	NA	NA		
Protected Phases	4	4	5	2	6	1	8
Permitted Phases							
Detector Phase	4	4	5	2	6		
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	9.5	22.5
Total Split (s)	23.0	23.0	11.0	25.0	23.5	9.5	22.5
Total Split (%)	28.8%	28.8%	13.8%	31.3%	29.4%	12%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		
Lead/Lag			Lead	Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	Min	Min	None	None
Act Effct Green (s)	6.0	6.0	5.9	26.9	25.4		
Actuated g/C Ratio	0.21	0.21	0.20	0.92	0.87		
v/c Ratio	0.03	0.02	0.02	0.10	0.09		
Control Delay	12.1	0.1	12.3	1.1	3.1		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	12.1	0.1	12.3	1.1	3.1		
LOS	B	A	B	A	A		
Approach Delay		6.1		1.3	3.1		
Approach LOS		A		A	A		

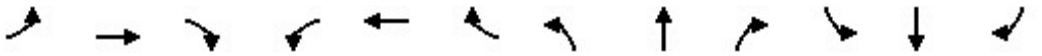
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 29.2	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.10	
Intersection Signal Delay: 2.2	Intersection LOS: A
Intersection Capacity Utilization 19.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	NBL	NBT	SBT
Lane Group Flow (vph)	11	11	8	472	375
v/c Ratio	0.03	0.02	0.02	0.10	0.09
Control Delay	12.1	0.1	12.3	1.1	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.1	0.1	12.3	1.1	3.1
Queue Length 50th (ft)	1	0	1	0	0
Queue Length 95th (ft)	11	0	9	20	34
Internal Link Dist (ft)		319		111	176
Turn Bay Length (ft)	170		115		
Base Capacity (vph)	1039	1106	384	4690	4508
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.01	0.02	0.10	0.08

Intersection Summary



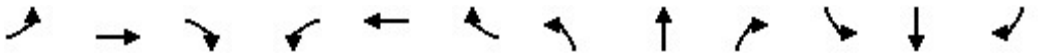
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	0	4	0	0	0	7	424	1	0	316	22
Future Volume (veh/h)	16	0	4	0	0	0	7	424	1	0	316	22
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1870	1870	1870	1870	1870	1772	1870	1870	1772	1870	1870
Adj Flow Rate, veh/h	22	0	0	0	0	0	8	471	1	0	351	24
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	97	54	0	0	10	0	18	2674	6	9	1298	88
Arrive On Green	0.03	0.00	0.00	0.00	0.00	0.00	0.01	0.51	0.51	0.00	0.27	0.27
Sat Flow, veh/h	3375	1870	0	0	1870	0	1688	5261	11	1688	4885	330
Grp Volume(v), veh/h	22	0	0	0	0	0	8	305	167	0	243	132
Grp Sat Flow(s),veh/h/ln	1688	1870	0	0	1870	0	1688	1702	1868	1688	1702	1811
Q Serve(g_s), s	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.9	0.9	0.0	1.1	1.1
Cycle Q Clear(g_c), s	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.9	0.9	0.0	1.1	1.1
Prop In Lane	1.00		0.00	0.00		0.00	1.00		0.01	1.00		0.18
Lane Grp Cap(c), veh/h	97	54	0	0	10	0	18	1730	949	9	905	481
V/C Ratio(X)	0.23	0.00	0.00	0.00	0.00	0.00	0.44	0.18	0.18	0.00	0.27	0.27
Avail Cap(c_a), veh/h	3212	1780	0	0	1732	0	564	3590	1970	434	3327	1770
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	9.2	0.0	0.0	0.0	0.0	0.0	9.6	2.6	2.6	0.0	5.6	5.7
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.0	0.0	0.0	15.4	0.0	0.1	0.0	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.4	0.0	0.0	0.0	0.0	0.0	25.0	2.6	2.7	0.0	5.8	6.0
LnGrp LOS	B	A	A	A	A	A	C	A	A	A	A	A
Approach Vol, veh/h		22			0			480			375	
Approach Delay, s/veh		10.4			0.0			3.0			5.9	
Approach LOS		B						A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	14.4		5.1	4.7	9.7		0.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	20.5		18.5	6.5	19.0		18.0				
Max Q Clear Time (g_c+I1), s	0.0	2.9		2.1	2.1	3.1		0.0				
Green Ext Time (p_c), s	0.0	2.7		0.0	0.0	2.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	4.4	
HCM 6th LOS	A	

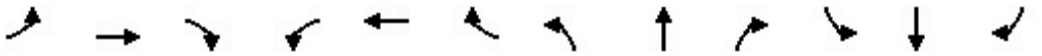
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			271			243			215			238
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



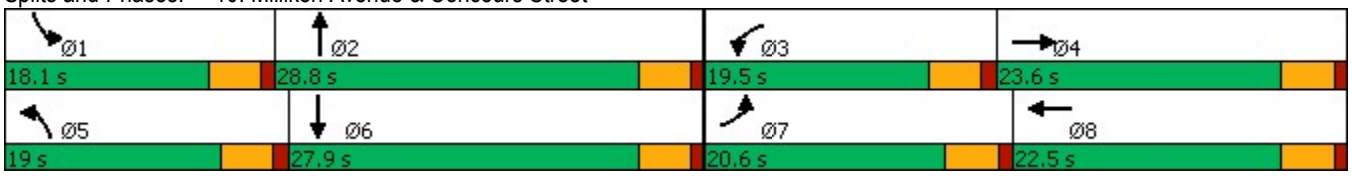
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	422	219	252	366	143	226	312	1400	341	393	1406	329
Future Volume (vph)	422	219	252	366	143	226	312	1400	341	393	1406	329
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	454	235	271	394	154	243	335	1505	367	423	1512	354
Shared Lane Traffic (%)												
Lane Group Flow (vph)	454	235	271	394	154	243	335	1505	367	423	1512	354

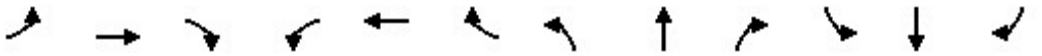
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	422	219	252	366	143	226	312	1400	341	393	1406	329
Future Volume (vph)	422	219	252	366	143	226	312	1400	341	393	1406	329
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	20.6	23.6		19.5	22.5		19.0	28.8		18.1	27.9	
Total Split (%)	22.9%	26.2%		21.7%	25.0%		21.1%	32.0%		20.1%	31.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	15.3	10.7	80.6	14.0	9.4	80.6	13.0	24.3	80.6	13.5	24.9	80.6
Actuated g/C Ratio	0.19	0.13	1.00	0.17	0.12	1.00	0.16	0.30	1.00	0.17	0.31	1.00
v/c Ratio	0.78	0.50	0.17	0.74	0.37	0.15	0.68	0.78	0.23	0.82	0.76	0.22
Control Delay	42.1	36.5	0.2	41.2	35.6	0.2	39.6	29.4	0.3	47.8	29.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.1	36.5	0.2	41.2	35.6	0.2	39.6	29.4	0.3	47.8	29.2	0.3
LOS	D	D	A	D	D	A	D	C	A	D	C	A
Approach Delay		28.9			27.5			26.1			28.2	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 80.6	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 27.5	Intersection LOS: C
Intersection Capacity Utilization 65.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 10: Milliken Avenue & Concours Street

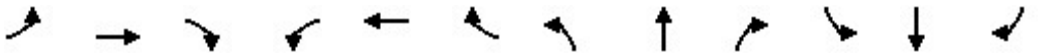




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	454	235	271	394	154	243	335	1505	367	423	1512	354
v/c Ratio	0.78	0.50	0.17	0.74	0.37	0.15	0.68	0.78	0.23	0.82	0.76	0.22
Control Delay	42.1	36.5	0.2	41.2	35.6	0.2	39.6	29.4	0.3	47.8	29.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.1	36.5	0.2	41.2	35.6	0.2	39.6	29.4	0.3	47.8	29.2	0.3
Queue Length 50th (ft)	113	60	0	97	38	0	82	203	0	108	206	0
Queue Length 95th (ft)	#186	94	0	#151	67	0	129	259	0	#192	265	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	614	840	1583	572	791	1583	553	1935	1583	519	1979	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.28	0.17	0.69	0.19	0.15	0.61	0.78	0.23	0.82	0.76	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



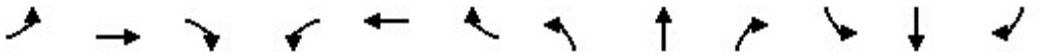
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	422	219	252	366	143	226	312	1400	341	393	1406	329
Future Volume (veh/h)	422	219	252	366	143	226	312	1400	341	393	1406	329
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	454	235	0	394	154	0	335	1505	0	423	1512	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	554	380		493	310		434	2019		513	2183	
Arrive On Green	0.18	0.11	0.00	0.16	0.09	0.00	0.14	0.31	0.00	0.17	0.34	0.00
Sat Flow, veh/h	3092	3554	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	454	235	0	394	154	0	335	1505	0	423	1512	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	10.0	4.5	0.0	8.7	2.9	0.0	7.4	14.8	0.0	9.4	14.4	0.0
Cycle Q Clear(g_c), s	10.0	4.5	0.0	8.7	2.9	0.0	7.4	14.8	0.0	9.4	14.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	554	380		493	310		434	2019		513	2183	
V/C Ratio(X)	0.82	0.62		0.80	0.50		0.77	0.75		0.83	0.69	
Avail Cap(c_a), veh/h	702	958		654	903		633	2206		593	2183	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.0	30.3	0.0	28.7	30.9	0.0	29.4	21.8	0.0	28.6	20.2	0.0
Incr Delay (d2), s/veh	6.1	1.6	0.0	5.2	1.2	0.0	3.6	1.3	0.0	8.2	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	1.9	0.0	3.4	1.3	0.0	2.9	5.4	0.0	3.9	5.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.1	31.9	0.0	33.9	32.1	0.0	32.9	23.1	0.0	36.8	21.2	0.0
LnGrp LOS	C	C		C	C		C	C		D	C	
Approach Vol, veh/h		689	A		548	A		1840	A		1935	A
Approach Delay, s/veh		33.3			33.4			24.9			24.6	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.3	26.7	15.8	12.1	14.4	28.5	17.2	10.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.6	24.3	15.0	19.1	14.5	23.4	16.1	18.0
Max Q Clear Time (g_c+I1), s	11.4	16.8	10.7	6.5	9.4	16.4	12.0	4.9
Green Ext Time (p_c), s	0.4	5.4	0.6	1.1	0.6	5.1	0.7	0.7

Intersection Summary	
HCM 6th Ctrl Delay	26.9
HCM 6th LOS	C

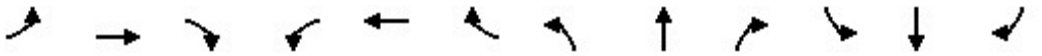
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1600	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3539	1583	4202	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3539	1583	4202	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			182			474			182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



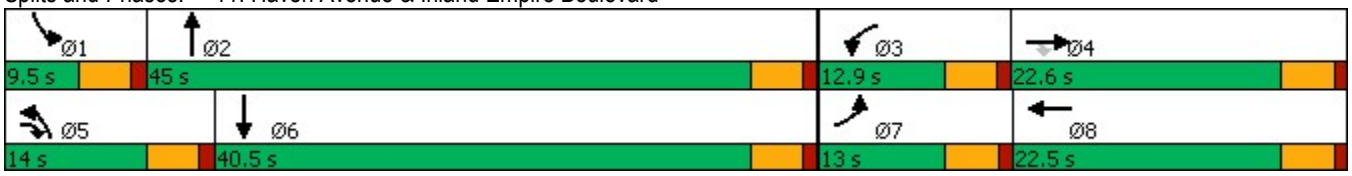
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	224	176	367	265	173	99	252	2367	798	77	2079	199
Future Volume (vph)	224	176	367	265	173	99	252	2367	798	77	2079	199
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	231	181	378	273	178	102	260	2440	823	79	2143	205
Shared Lane Traffic (%)												
Lane Group Flow (vph)	231	181	378	273	178	102	260	2440	823	79	2143	205

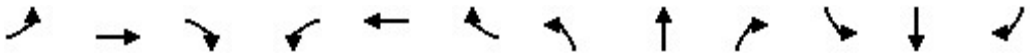
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	224	176	367	265	173	99	252	2367	798	77	2079	199
Future Volume (vph)	224	176	367	265	173	99	252	2367	798	77	2079	199
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	13.0	22.6	14.0	12.9	22.5		14.0	45.0		9.5	40.5	
Total Split (%)	14.4%	25.1%	15.6%	14.3%	25.0%		15.6%	50.0%		10.6%	45.0%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	8.5	9.6	23.5	8.3	9.4	81.4	9.4	42.4	81.4	5.0	36.0	81.4
Actuated g/C Ratio	0.10	0.12	0.29	0.10	0.12	1.00	0.12	0.52	1.00	0.06	0.44	1.00
v/c Ratio	0.72	0.43	0.74	0.64	0.44	0.06	0.73	0.73	0.52	0.42	0.76	0.13
Control Delay	50.0	36.7	30.9	42.7	36.9	0.1	48.6	17.5	1.2	44.5	21.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	36.7	30.9	42.7	36.9	0.1	48.6	17.5	1.2	44.5	21.4	0.2
LOS	D	D	C	D	D	A	D	B	A	D	C	A
Approach Delay		37.8			33.0			16.0			20.3	
Approach LOS		D			C			B			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 81.4	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 21.1	Intersection LOS: C
Intersection Capacity Utilization 70.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	231	181	378	273	178	102	260	2440	823	79	2143	205
v/c Ratio	0.72	0.43	0.74	0.64	0.44	0.06	0.73	0.73	0.52	0.42	0.76	0.13
Control Delay	50.0	36.7	30.9	42.7	36.9	0.1	48.6	17.5	1.2	44.5	21.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	36.7	30.9	42.7	36.9	0.1	48.6	17.5	1.2	44.5	21.4	0.2
Queue Length 50th (ft)	59	45	140	48	45	0	67	278	0	20	256	0
Queue Length 95th (ft)	#114	76	241	76	76	0	#124	347	0	43	320	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	320	787	510	434	783	1583	358	3340	1583	188	2836	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.23	0.74	0.63	0.23	0.06	0.73	0.73	0.52	0.42	0.76	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	224	176	367	265	173	99	252	2367	798	77	2079	199
Future Volume (veh/h)	224	176	367	265	173	99	252	2367	798	77	2079	199
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1575	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	231	181	378	273	178	0	260	2440	0	79	2143	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	295	730	492	367	699		325	2928		150	2564	
Arrive On Green	0.10	0.21	0.21	0.09	0.20	0.00	0.10	0.46	0.00	0.05	0.40	0.00
Sat Flow, veh/h	3092	3554	1585	4230	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	231	181	378	273	178	0	260	2440	0	79	2143	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1410	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	6.4	3.8	18.1	5.6	3.7	0.0	7.2	29.3	0.0	2.2	26.5	0.0
Cycle Q Clear(g_c), s	6.4	3.8	18.1	5.6	3.7	0.0	7.2	29.3	0.0	2.2	26.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	295	730	492	367	699		325	2928		150	2564	
V/C Ratio(X)	0.78	0.25	0.77	0.74	0.25		0.80	0.83		0.53	0.84	
Avail Cap(c_a), veh/h	298	730	492	403	726		333	2958		175	2629	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.9	29.3	27.5	39.3	29.9	0.0	38.5	21.1	0.0	40.9	23.9	0.0
Incr Delay (d2), s/veh	12.6	0.2	7.2	6.7	0.2	0.0	12.8	2.2	0.0	2.8	2.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	1.6	7.9	2.1	1.6	0.0	3.3	10.7	0.0	0.9	9.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.5	29.5	34.7	46.0	30.1	0.0	51.3	23.2	0.0	43.8	26.3	0.0
LnGrp LOS	D	C	C	D	C		D	C		D	C	
Approach Vol, veh/h		790			451	A		2700	A		2222	A
Approach Delay, s/veh		38.4			39.7			25.9			27.0	
Approach LOS		D			D			C			C	

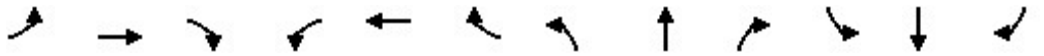
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.8	44.6	12.1	22.6	13.7	39.6	12.9	21.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	40.5	8.4	18.1	9.5	36.0	8.5	18.0
Max Q Clear Time (g_c+I1), s	4.2	31.3	7.6	20.1	9.2	28.5	8.4	5.7
Green Ext Time (p_c), s	0.0	8.4	0.1	0.0	0.0	6.7	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	28.9
HCM 6th LOS	C

Notes

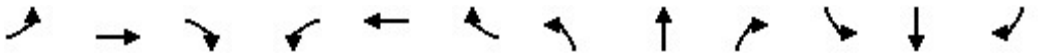
User approved changes to right turn type.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			354			197			594			193
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



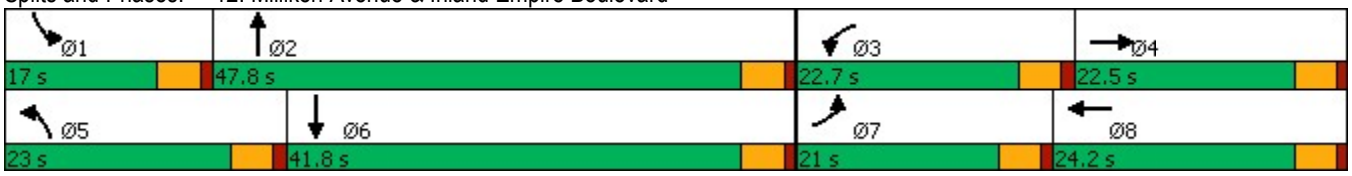
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	251	417	382	504	195	191	488	1557	1112	200	1863	157
Future Volume (vph)	251	417	382	504	195	191	488	1557	1112	200	1863	157
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	259	430	394	520	201	197	503	1605	1146	206	1921	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	259	430	394	520	201	197	503	1605	1146	206	1921	162

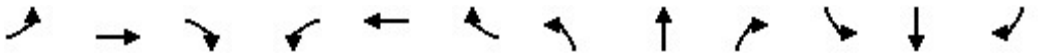
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	251	417	382	504	195	191	488	1557	1112	200	1863	157
Future Volume (vph)	251	417	382	504	195	191	488	1557	1112	200	1863	157
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	21.0	22.5		22.7	24.2		23.0	47.8		17.0	41.8	
Total Split (%)	19.1%	20.5%		20.6%	22.0%		20.9%	43.5%		15.5%	38.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	14.0	16.8	108.8	18.2	21.0	108.8	18.5	44.4	108.8	11.4	37.3	108.8
Actuated g/C Ratio	0.13	0.15	1.00	0.17	0.19	1.00	0.17	0.41	1.00	0.10	0.34	1.00
v/c Ratio	0.66	0.79	0.25	1.01	0.29	0.12	0.96	0.61	0.72	0.64	0.87	0.10
Control Delay	53.3	55.6	0.4	88.6	39.5	0.2	77.0	27.0	2.9	56.2	39.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.3	55.6	0.4	88.6	39.5	0.2	77.0	27.0	2.9	56.2	39.2	0.1
LOS	D	E	A	F	D	A	E	C	A	E	D	A
Approach Delay		35.0			58.9			26.3			38.0	
Approach LOS		C			E			C			D	

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 108.8	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 35.0	Intersection LOS: D
Intersection Capacity Utilization 85.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	259	430	394	520	201	197	503	1605	1146	206	1921	162
v/c Ratio	0.66	0.79	0.25	1.01	0.29	0.12	0.96	0.61	0.72	0.64	0.87	0.10
Control Delay	53.3	55.6	0.4	88.6	39.5	0.2	77.0	27.0	2.9	56.2	39.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.3	55.6	0.4	88.6	39.5	0.2	77.0	27.0	2.9	56.2	39.2	0.1
Queue Length 50th (ft)	90	154	0	~202	64	0	184	262	0	72	369	0
Queue Length 95th (ft)	131	210	0	#309	101	0	#292	303	0	111	420	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	465	585	1583	514	682	1583	522	2614	1583	353	2197	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.74	0.25	1.01	0.29	0.12	0.96	0.61	0.72	0.58	0.87	0.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	251	417	382	504	195	191	488	1557	1112	200	1863	157
Future Volume (veh/h)	251	417	382	504	195	191	488	1557	1112	200	1863	157
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	259	430	0	520	201	0	503	1605	0	206	1921	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	323	515		527	749		536	2767		265	2204	
Arrive On Green	0.10	0.14	0.00	0.17	0.21	0.00	0.17	0.43	0.00	0.09	0.34	0.00
Sat Flow, veh/h	3092	3554	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	259	430	0	520	201	0	503	1605	0	206	1921	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	8.7	12.6	0.0	17.9	5.0	0.0	17.1	20.2	0.0	7.0	29.9	0.0
Cycle Q Clear(g_c), s	8.7	12.6	0.0	17.9	5.0	0.0	17.1	20.2	0.0	7.0	29.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	323	515		527	749		536	2767		265	2204	
V/C Ratio(X)	0.80	0.84		0.99	0.27		0.94	0.58		0.78	0.87	
Avail Cap(c_a), veh/h	478	600		527	749		536	2767		362	2249	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	46.7	44.4	0.0	44.1	35.2	0.0	43.5	23.1	0.0	47.8	32.9	0.0
Incr Delay (d2), s/veh	5.9	8.8	0.0	35.4	0.2	0.0	24.5	0.3	0.0	7.1	4.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	6.1	0.0	9.4	2.2	0.0	8.3	7.5	0.0	2.9	12.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.6	53.2	0.0	79.6	35.4	0.0	68.0	23.4	0.0	54.9	36.9	0.0
LnGrp LOS	D	D		E	D		E	C		D	D	
Approach Vol, veh/h		689	A		721	A		2108	A		2127	A
Approach Delay, s/veh		53.0			67.3			34.0			38.6	
Approach LOS		D			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.7	50.4	22.7	20.0	23.0	41.0	15.7	27.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	43.3	18.2	18.0	18.5	37.3	16.5	19.7
Max Q Clear Time (g_c+I1), s	9.0	22.2	19.9	14.6	19.1	31.9	10.7	7.0
Green Ext Time (p_c), s	0.2	12.4	0.0	0.9	0.0	4.7	0.4	0.9

Intersection Summary	
HCM 6th Ctrl Delay	42.3
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1800	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.925	0.850				
Flt Protected	0.976					
Satd. Flow (prot)	3091	1441	6408	0	0	6408
Flt Permitted	0.976					
Satd. Flow (perm)	3091	1441	6408	0	0	6408
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	1	1				
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	339	677	2672	0	0	1817
Future Volume (vph)	339	677	2672	0	0	1817
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.98	0.98	0.98	0.92	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	346	691	2727	0	0	1854
Shared Lane Traffic (%)		50%				
Lane Group Flow (vph)	692	345	2727	0	0	1854

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	339	677	2672	1817
Future Volume (vph)	339	677	2672	1817
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	36.0	36.0
Total Split (%)	40.0%	40.0%	60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	17.5	17.5	31.6	31.6
Actuated g/C Ratio	0.30	0.30	0.54	0.54
v/c Ratio	0.74	0.79	0.78	0.53
Control Delay	23.7	34.1	13.0	9.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.7	34.1	13.0	9.6
LOS	C	C	B	A
Approach Delay	27.2		13.0	9.6
Approach LOS	C		B	A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 58.1	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 14.5	Intersection LOS: B
Intersection Capacity Utilization 88.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	692	345	2727	1854
v/c Ratio	0.74	0.79	0.78	0.53
Control Delay	23.7	34.1	13.0	9.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.7	34.1	13.0	9.6
Queue Length 50th (ft)	109	118	215	118
Queue Length 95th (ft)	162	#249	265	148
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	1040	485	3482	3482
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.67	0.71	0.78	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

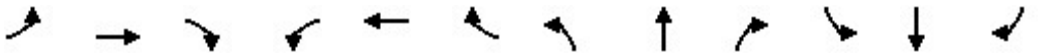
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	339	677	2672	0	0	1817
Future Volume (veh/h)	339	677	2672	0	0	1817
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1772	1870	1870	0	0	1870
Adj Flow Rate, veh/h	346	691	2727	0	0	1854
Peak Hour Factor	0.98	0.98	0.98	0.92	0.98	0.98
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	473	889	3584	0	0	3584
Arrive On Green	0.28	0.28	0.56	0.00	0.00	0.56
Sat Flow, veh/h	1688	3170	6958	0	0	6958
Grp Volume(v), veh/h	346	691	2727	0	0	1854
Grp Sat Flow(s),veh/h/ln	1688	1585	1609	0	0	1609
Q Serve(g_s), s	10.3	11.1	18.0	0.0	0.0	9.9
Cycle Q Clear(g_c), s	10.3	11.1	18.0	0.0	0.0	9.9
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	473	889	3584	0	0	3584
V/C Ratio(X)	0.73	0.78	0.76	0.00	0.00	0.52
Avail Cap(c_a), veh/h	595	1117	3662	0	0	3662
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	18.0	18.3	9.4	0.0	0.0	7.6
Incr Delay (d2), s/veh	3.5	2.8	1.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	4.0	4.9	0.0	0.0	2.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.5	21.1	10.4	0.0	0.0	7.8
LnGrp LOS	C	C	B	A	A	A
Approach Vol, veh/h	1037		2727			1854
Approach Delay, s/veh	21.2		10.4			7.8
Approach LOS	C		B			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		35.3			35.3	20.0
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		31.5			31.5	19.5
Max Q Clear Time (g_c+I1), s		20.0			11.9	13.1
Green Ext Time (p_c), s		10.8			13.6	2.4

Intersection Summary	
HCM 6th Ctrl Delay	11.5
HCM 6th LOS	B

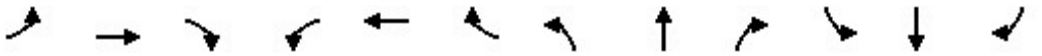
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	1863	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	1863	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			155			125			55
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



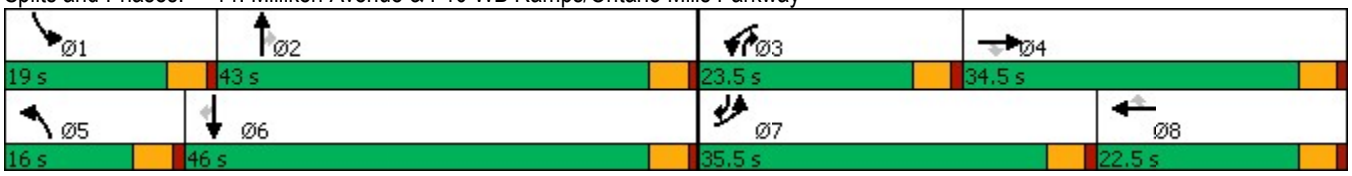
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	867	320	182	388	484	144	294	1895	589	427	1404	1117
Future Volume (vph)	867	320	182	388	484	144	294	1895	589	427	1404	1117
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	932	344	196	417	520	155	316	2038	633	459	1510	1201
Shared Lane Traffic (%)												
Lane Group Flow (vph)	932	344	196	417	520	155	316	2038	633	459	1510	1201

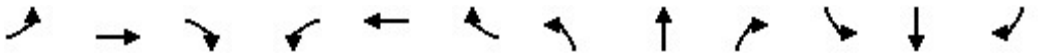
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	867	320	182	388	484	144	294	1895	589	427	1404	1117
Future Volume (vph)	867	320	182	388	484	144	294	1895	589	427	1404	1117
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	35.5	34.5	34.5	23.5	22.5	22.5	16.0	43.0	23.5	19.0	46.0	35.5
Total Split (%)	29.6%	28.8%	28.8%	19.6%	18.8%	18.8%	13.3%	35.8%	19.6%	15.8%	38.3%	29.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	31.0	30.3	30.3	18.7	18.0	18.0	11.5	38.5	61.7	14.5	41.5	77.0
Actuated g/C Ratio	0.26	0.25	0.25	0.16	0.15	0.15	0.10	0.32	0.51	0.12	0.35	0.64
v/c Ratio	1.18	0.73	0.42	0.87	0.98	0.42	1.07	0.99	0.72	1.24	0.68	1.16
Control Delay	131.8	51.7	22.0	68.9	85.8	10.7	124.8	58.7	23.4	171.6	35.5	105.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	131.8	51.7	22.0	68.9	85.8	10.7	124.8	58.7	23.4	171.6	35.5	105.4
LOS	F	D	C	E	F	B	F	E	C	F	D	F
Approach Delay		98.4			68.7			58.2			81.7	
Approach LOS		F			E			E			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.24	
Intersection Signal Delay: 74.9	Intersection LOS: E
Intersection Capacity Utilization 103.2%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway



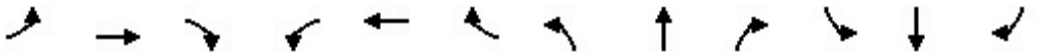


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	932	344	196	417	520	155	316	2038	633	459	1510	1201
v/c Ratio	1.18	0.73	0.42	0.87	0.98	0.42	1.07	0.99	0.72	1.24	0.68	1.16
Control Delay	131.8	51.7	22.0	68.9	85.8	10.7	124.8	58.7	23.4	171.6	35.5	105.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	131.8	51.7	22.0	68.9	85.8	10.7	124.8	58.7	23.4	171.6	35.5	105.4
Queue Length 50th (ft)	~444	246	63	163	213	0	~140	455	298	~227	289	~1089
Queue Length 95th (ft)	#572	356	134	#247	#328	60	#233	#549	449	#333	331	#1353
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	793	469	470	486	530	369	294	2055	878	371	2216	1035
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.18	0.73	0.42	0.86	0.98	0.42	1.07	0.99	0.72	1.24	0.68	1.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	867	320	182	388	484	144	294	1895	589	427	1404	1117
Future Volume (veh/h)	867	320	182	388	484	144	294	1895	589	427	1404	1117
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	932	344	196	417	520	155	316	2038	633	459	1510	1201
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	799	482	408	466	533	238	296	2064	747	374	2225	958
Arrive On Green	0.26	0.26	0.26	0.15	0.15	0.15	0.10	0.32	0.32	0.12	0.35	0.35
Sat Flow, veh/h	3092	1870	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	932	344	196	417	520	155	316	2038	633	459	1510	1201
Grp Sat Flow(s),veh/h/ln	1546	1870	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	31.0	20.1	12.6	15.9	17.5	11.1	11.5	37.8	38.5	14.5	24.1	41.5
Cycle Q Clear(g_c), s	31.0	20.1	12.6	15.9	17.5	11.1	11.5	37.8	38.5	14.5	24.1	41.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	799	482	408	466	533	238	296	2064	747	374	2225	958
V/C Ratio(X)	1.17	0.71	0.48	0.89	0.98	0.65	1.07	0.99	0.85	1.23	0.68	1.25
Avail Cap(c_a), veh/h	799	482	408	490	533	238	296	2064	747	374	2225	958
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.5	40.5	37.7	50.0	50.8	48.0	54.2	40.5	27.9	52.8	33.5	23.7
Incr Delay (d2), s/veh	88.4	5.0	0.9	18.2	32.6	6.2	71.0	16.8	9.0	124.3	0.8	123.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.6	9.9	5.0	7.3	10.2	4.8	7.4	17.1	17.4	12.1	9.5	57.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	132.9	45.5	38.6	68.2	83.4	54.2	125.2	57.3	36.8	177.0	34.4	146.7
LnGrp LOS	F	D	D	E	F	D	F	E	D	F	C	F
Approach Vol, veh/h		1472			1092			2987			3170	
Approach Delay, s/veh		99.9			73.5			60.2			97.6	
Approach LOS		F			E			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	43.0	22.6	35.4	16.0	46.0	35.5	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	38.5	19.0	30.0	11.5	41.5	31.0	18.0
Max Q Clear Time (g_c+I1), s	16.5	40.5	17.9	22.1	13.5	43.5	33.0	19.5
Green Ext Time (p_c), s	0.0	0.0	0.2	1.8	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	82.2
HCM 6th LOS	F

Notes

User approved changes to right turn type.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.992	0.850				
Flt Protected	0.955					
Satd. Flow (prot)	3243	1441	0	6408	6408	0
Flt Permitted	0.955					
Satd. Flow (perm)	3243	1441	0	6408	6408	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	1	1				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

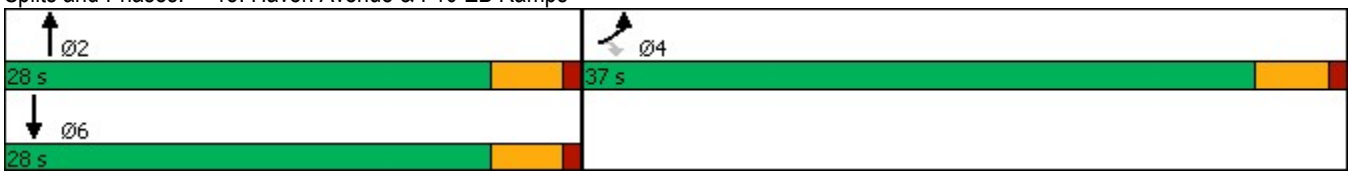
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	1400	752	0	2079	1704	0
Future Volume (vph)	1400	752	0	2079	1704	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1443	775	0	2143	1757	0
Shared Lane Traffic (%)		11%				
Lane Group Flow (vph)	1528	690	0	2143	1757	0

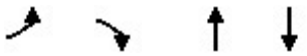
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1400	752	2079	1704
Future Volume (vph)	1400	752	2079	1704
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	37.0	37.0	28.0	28.0
Total Split (%)	56.9%	56.9%	43.1%	43.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	32.5	32.5	23.5	23.5
Actuated g/C Ratio	0.50	0.50	0.36	0.36
v/c Ratio	0.94	0.96	0.93	0.76
Control Delay	29.3	43.3	28.7	20.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	29.3	43.3	28.7	20.9
LOS	C	D	C	C
Approach Delay	33.7		28.7	20.9
Approach LOS	C		C	C

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 28.2	Intersection LOS: C
Intersection Capacity Utilization 88.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1528	690	2143	1757
v/c Ratio	0.94	0.96	0.93	0.76
Control Delay	29.3	43.3	28.7	20.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	29.3	43.3	28.7	20.9
Queue Length 50th (ft)	274	268	230	173
Queue Length 95th (ft)	#437	#518	#315	215
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	1622	721	2316	2316
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.94	0.96	0.93	0.76

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1400	752	0	2079	1704	0
Future Volume (veh/h)	1400	752	0	2079	1704	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1772	1870	0	1870	1870	0
Adj Flow Rate, veh/h	1476	739	0	2143	1757	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	1679	789	0	2336	2336	0
Arrive On Green	0.50	0.50	0.00	0.36	0.36	0.00
Sat Flow, veh/h	3375	1585	0	6958	6958	0
Grp Volume(v), veh/h	1476	739	0	2143	1757	0
Grp Sat Flow(s),veh/h/ln	1688	1585	0	1609	1609	0
Q Serve(g_s), s	25.2	28.3	0.0	20.5	15.4	0.0
Cycle Q Clear(g_c), s	25.2	28.3	0.0	20.5	15.4	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	1679	789	0	2336	2336	0
V/C Ratio(X)	0.88	0.94	0.00	0.92	0.75	0.00
Avail Cap(c_a), veh/h	1699	798	0	2342	2342	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.5	15.3	0.0	19.6	18.0	0.0
Incr Delay (d2), s/veh	5.6	18.3	0.0	6.3	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.3	12.5	0.0	7.9	5.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.1	33.6	0.0	26.0	19.4	0.0
LnGrp LOS	C	C	A	C	B	A
Approach Vol, veh/h	2215			2143	1757	
Approach Delay, s/veh	24.6			26.0	19.4	
Approach LOS	C			C	B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		27.9		36.6		27.9
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		23.5		32.5		23.5
Max Q Clear Time (g_c+I1), s		22.5		30.3		17.4
Green Ext Time (p_c), s		0.9		1.8		4.9

Intersection Summary		
HCM 6th Ctrl Delay		23.6
HCM 6th LOS		C

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1700	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3072	1583	3072	6408	6408	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3072	1583	3072	6408	6408	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		2				51
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	1243	310	221	1605	1171	839
Future Volume (vph)	1243	310	221	1605	1171	839
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1281	320	228	1655	1207	865
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1281	320	228	1655	1207	865

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1243	310	221	1605	1171	839
Future Volume (vph)	1243	310	221	1605	1171	839
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	39.0	12.0	12.0	36.0	24.0	39.0
Total Split (%)	52.0%	16.0%	16.0%	48.0%	32.0%	52.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	33.8	45.8	7.5	31.3	19.3	57.6
Actuated g/C Ratio	0.46	0.62	0.10	0.42	0.26	0.78
v/c Ratio	0.91	0.33	0.73	0.61	0.72	0.70
Control Delay	30.7	7.9	48.3	18.0	28.0	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.7	7.9	48.3	18.0	28.0	7.4
LOS	C	A	D	B	C	A
Approach Delay	26.1			21.6	19.4	
Approach LOS	C			C	B	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 74.1	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 22.1	Intersection LOS: C
Intersection Capacity Utilization 74.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	1281	320	228	1655	1207	865
v/c Ratio	0.91	0.33	0.73	0.61	0.72	0.70
Control Delay	30.7	7.9	48.3	18.0	28.0	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.7	7.9	48.3	18.0	28.0	7.4
Queue Length 50th (ft)	271	62	54	168	148	127
Queue Length 95th (ft)	#413	105	#105	205	186	230
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	1431	979	311	2726	1688	1256
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.33	0.73	0.61	0.72	0.69

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

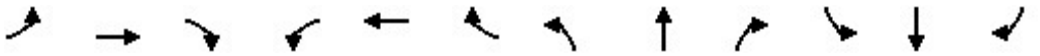
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1243	310	221	1605	1171	839
Future Volume (veh/h)	1243	310	221	1605	1171	839
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1870	1673	1870	1870	1870
Adj Flow Rate, veh/h	1281	320	228	1655	1207	865
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1393	870	304	2743	1714	1137
Arrive On Green	0.45	0.45	0.10	0.43	0.27	0.27
Sat Flow, veh/h	3092	1585	3092	6696	6696	1585
Grp Volume(v), veh/h	1281	320	228	1655	1207	865
Grp Sat Flow(s),veh/h/ln	1546	1585	1546	1609	1609	1585
Q Serve(g_s), s	28.4	8.3	5.3	14.5	12.4	19.5
Cycle Q Clear(g_c), s	28.4	8.3	5.3	14.5	12.4	19.5
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1393	870	304	2743	1714	1137
V/C Ratio(X)	0.92	0.37	0.75	0.60	0.70	0.76
Avail Cap(c_a), veh/h	1458	903	317	2770	1714	1137
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.9	9.3	32.1	16.2	24.2	5.7
Incr Delay (d2), s/veh	9.5	0.3	9.2	0.4	1.3	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.9	9.5	2.3	5.0	4.6	16.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.3	9.6	41.3	16.6	25.6	8.8
LnGrp LOS	C	A	D	B	C	A
Approach Vol, veh/h	1601			1883	2072	
Approach Delay, s/veh	24.6			19.6	18.5	
Approach LOS	C			B	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		35.7		37.5	11.7	24.0
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		31.5		34.5	7.5	19.5
Max Q Clear Time (g_c+I1), s		16.5		30.4	7.3	21.5
Green Ext Time (p_c), s		10.1		2.5	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	20.6
HCM 6th LOS	C

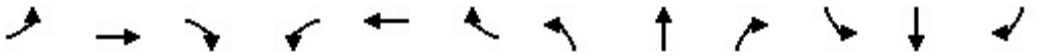
Appendix I

Intersection LOS Analysis Sheets
Horizon Year (2040) With Project Conditions



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.962				0.850			0.850		0.994	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	4892	0	3072	3539	1583	3072	5085	1583	3072	6369	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	4892	0	3072	3539	1583	3072	5085	1583	3072	6369	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		66				149			238		9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



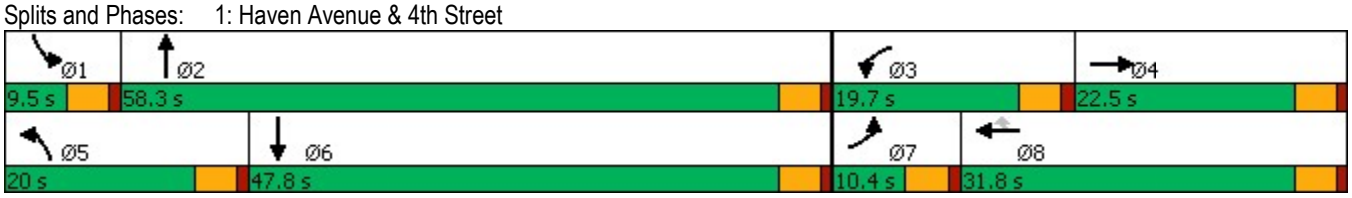
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	130	425	143	372	741	205	293	2155	681	134	1728	77
Future Volume (vph)	130	425	143	372	741	205	293	2155	681	134	1728	77
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	143	467	157	409	814	225	322	2368	748	147	1899	85
Shared Lane Traffic (%)												
Lane Group Flow (vph)	143	624	0	409	814	225	322	2368	748	147	1984	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	130	425	372	741	205	293	2155	681	134	1728
Future Volume (vph)	130	425	372	741	205	293	2155	681	134	1728
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	10.4	22.5	19.7	31.8	31.8	20.0	58.3		9.5	47.8
Total Split (%)	9.5%	20.5%	17.9%	28.9%	28.9%	18.2%	53.0%		8.6%	43.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	5.9	18.0	15.2	27.3	27.3	14.8	53.8	110.0	5.0	44.1
Actuated g/C Ratio	0.05	0.16	0.14	0.25	0.25	0.13	0.49	1.00	0.05	0.40
v/c Ratio	0.87	0.73	0.96	0.93	0.45	0.78	0.95	0.47	1.06	0.78
Control Delay	95.2	44.7	83.4	58.2	15.5	60.0	37.1	1.0	143.4	31.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	95.2	44.7	83.4	58.2	15.5	60.0	37.1	1.0	143.4	31.3
LOS	F	D	F	E	B	E	D	A	F	C
Approach Delay		54.1		58.7			31.4			39.0
Approach LOS		D		E			C			D

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 110	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 40.8	Intersection LOS: D
Intersection Capacity Utilization 85.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Haven Avenue & 4th Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	143	624	409	814	225	322	2368	748	147	1984
v/c Ratio	0.87	0.73	0.96	0.93	0.45	0.78	0.95	0.47	1.06	0.78
Control Delay	95.2	44.7	83.4	58.2	15.5	60.0	37.1	1.0	143.4	31.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	95.2	44.7	83.4	58.2	15.5	60.0	37.1	1.0	143.4	31.3
Queue Length 50th (ft)	52	138	150	296	43	113	566	0	~58	351
Queue Length 95th (ft)	#111	182	#247	#414	113	#171	#701	0	#125	400
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	164	855	424	878	504	432	2488	1583	139	2556
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.73	0.96	0.93	0.45	0.75	0.95	0.47	1.06	0.78

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

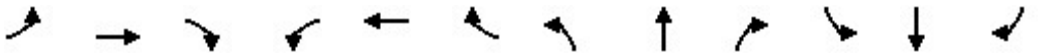
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	425	143	372	741	205	293	2155	681	134	1728	77
Future Volume (veh/h)	130	425	143	372	741	205	293	2155	681	134	1728	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	143	467	157	409	814	225	322	2368	0	147	1899	85
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	166	616	200	428	876	391	379	2503		141	2627	118
Arrive On Green	0.05	0.16	0.16	0.14	0.25	0.25	0.12	0.49	0.00	0.05	0.41	0.41
Sat Flow, veh/h	3092	3814	1238	3092	3554	1585	3092	5106	1585	3092	6360	285
Grp Volume(v), veh/h	143	415	209	409	814	225	322	2368	0	147	1441	543
Grp Sat Flow(s),veh/h/ln	1546	1702	1648	1546	1777	1585	1546	1702	1585	1546	1609	1819
Q Serve(g_s), s	5.0	12.8	13.4	14.4	24.6	13.7	11.2	48.4	0.0	5.0	27.4	27.4
Cycle Q Clear(g_c), s	5.0	12.8	13.4	14.4	24.6	13.7	11.2	48.4	0.0	5.0	27.4	27.4
Prop In Lane	1.00		0.75	1.00		1.00	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	166	550	266	428	876	391	379	2503		141	1993	751
V/C Ratio(X)	0.86	0.75	0.78	0.95	0.93	0.58	0.85	0.95		1.04	0.72	0.72
Avail Cap(c_a), veh/h	166	558	270	428	884	394	437	2503		141	1993	751
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.5	43.9	44.2	46.9	40.4	36.3	47.1	26.6	0.0	52.4	26.9	26.9
Incr Delay (d2), s/veh	33.8	5.7	13.9	32.1	15.9	2.0	13.1	9.1	0.0	87.8	2.3	6.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	5.8	6.5	7.4	12.5	5.5	5.0	20.8	0.0	3.7	10.7	12.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	85.3	49.6	58.1	79.0	56.3	38.3	60.2	35.7	0.0	140.2	29.3	32.9
LnGrp LOS	F	D	E	E	E	D	E	D		F	C	C
Approach Vol, veh/h		767			1448			2690	A		2131	
Approach Delay, s/veh		58.6			59.9			38.7			37.8	
Approach LOS		E			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	58.3	19.7	22.2	18.0	49.8	10.4	31.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	53.8	15.2	18.0	15.5	43.3	5.9	27.3
Max Q Clear Time (g_c+I1), s	7.0	50.4	16.4	15.4	13.2	29.4	7.0	26.6
Green Ext Time (p_c), s	0.0	3.2	0.0	1.0	0.3	10.5	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	45.0
HCM 6th LOS	D

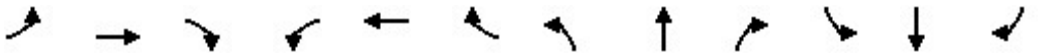
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.990				0.850			0.850		0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	6344	0	1676	5085	1583	1676	1863	1583	1676	3008	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1676	6344	0	1676	5085	1583	1676	1863	1583	1676	3008	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20				164			164		315	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	54	693	49	1	976	109	44	1	1	176	0	4
Future Volume (vph)	54	693	49	1	976	109	44	1	1	176	0	4
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	60	770	54	1	1084	121	49	1	1	196	0	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	824	0	1	1084	121	49	1	1	196	4	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	54	693	1	976	109	44	1	1	176	0
Future Volume (vph)	54	693	1	976	109	44	1	1	176	0
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			2		
Detector Phase	7	4	3	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5
Total Split (s)	9.5	22.5	9.5	22.5	22.5	11.3	23.0	23.0	15.0	26.7
Total Split (%)	13.6%	32.1%	13.6%	32.1%	32.1%	16.1%	32.9%	32.9%	21.4%	38.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	5.1	20.9	5.1	17.4	17.4	6.4	5.7	5.7	10.0	14.1
Actuated g/C Ratio	0.10	0.40	0.10	0.33	0.33	0.12	0.11	0.11	0.19	0.27
v/c Ratio	0.37	0.32	0.01	0.64	0.19	0.24	0.00	0.00	0.61	0.00
Control Delay	31.2	11.2	24.0	17.5	2.4	25.8	23.0	0.0	30.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.2	11.2	24.0	17.5	2.4	25.8	23.0	0.0	30.8	0.0
LOS	C	B	C	B	A	C	C	A	C	A
Approach Delay		12.6		16.0			25.2			30.2
Approach LOS		B		B			C			C

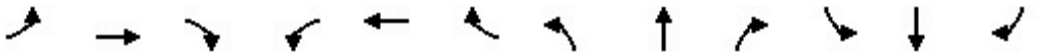
Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 52	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 16.1	Intersection LOS: B
Intersection Capacity Utilization 51.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	60	824	1	1084	121	49	1	1	196	4
v/c Ratio	0.37	0.32	0.01	0.64	0.19	0.24	0.00	0.00	0.61	0.00
Control Delay	31.2	11.2	24.0	17.5	2.4	25.8	23.0	0.0	30.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.2	11.2	24.0	17.5	2.4	25.8	23.0	0.0	30.8	0.0
Queue Length 50th (ft)	20	43	0	115	0	16	0	0	62	0
Queue Length 95th (ft)	51	85	4	157	18	42	4	0	#138	0
Internal Link Dist (ft)		2546		362			269			358
Turn Bay Length (ft)	130		130		145	165		165	50	
Base Capacity (vph)	164	2669	164	1791	664	223	674	677	344	1485
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.31	0.01	0.61	0.18	0.22	0.00	0.00	0.57	0.00

Intersection Summary

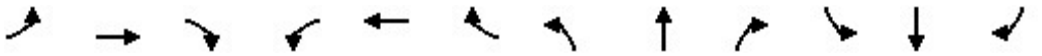
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	693	49	1	976	109	44	1	1	176	0	4
Future Volume (veh/h)	54	693	49	1	976	109	44	1	1	176	0	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1870	1870	1772	1870	1870	1772	1870	1870	1772	1870	1870
Adj Flow Rate, veh/h	60	770	54	1	1084	121	49	1	1	196	0	4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	97	2300	160	4	1611	500	84	196	166	246	356	318
Arrive On Green	0.06	0.37	0.37	0.00	0.32	0.32	0.05	0.10	0.10	0.15	0.00	0.20
Sat Flow, veh/h	1688	6189	429	1688	5106	1585	1688	1870	1585	1688	1777	1585
Grp Volume(v), veh/h	60	599	225	1	1084	121	49	1	1	196	0	4
Grp Sat Flow(s),veh/h/ln	1688	1609	1793	1688	1702	1585	1688	1870	1585	1688	1777	1585
Q Serve(g_s), s	1.7	4.3	4.3	0.0	8.8	2.7	1.4	0.0	0.0	5.4	0.0	0.1
Cycle Q Clear(g_c), s	1.7	4.3	4.3	0.0	8.8	2.7	1.4	0.0	0.0	5.4	0.0	0.1
Prop In Lane	1.00		0.24	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	97	1793	666	4	1611	500	84	196	166	246	356	318
V/C Ratio(X)	0.62	0.33	0.34	0.28	0.67	0.24	0.58	0.01	0.01	0.80	0.00	0.01
Avail Cap(c_a), veh/h	177	1817	675	177	1923	597	240	724	614	371	825	736
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.0	10.8	10.8	23.8	14.2	12.1	22.2	19.2	19.2	19.7	0.0	15.3
Incr Delay (d2), s/veh	6.3	0.1	0.3	38.8	0.7	0.2	6.2	0.0	0.0	7.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	1.3	1.5	0.0	3.0	0.8	0.6	0.0	0.0	2.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.3	10.9	11.1	62.7	14.9	12.4	28.4	19.2	19.2	26.7	0.0	15.3
LnGrp LOS	C	B	B	E	B	B	C	B	B	C	A	B
Approach Vol, veh/h		884			1206			51			200	
Approach Delay, s/veh		12.1			14.7			28.0			26.5	
Approach LOS		B			B			C			C	

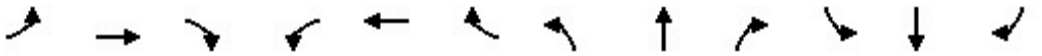
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.5	9.5	4.6	22.3	6.9	14.1	7.2	19.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	18.5	5.0	18.0	6.8	22.2	5.0	18.0
Max Q Clear Time (g_c+I1), s	7.4	2.0	2.0	6.3	3.4	2.1	3.7	10.8
Green Ext Time (p_c), s	0.2	0.0	0.0	4.3	0.0	0.0	0.0	4.3

Intersection Summary	
HCM 6th Ctrl Delay	15.0
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1800	1900	1900	1800	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.996				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.956	
Satd. Flow (prot)	3072	6401	0	1676	5065	0	1676	1863	1583	0	1781	1583
Flt Permitted	0.950			0.950			0.720				0.739	
Satd. Flow (perm)	3072	6401	0	1676	5065	0	1271	1863	1583	0	1377	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			7				109			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



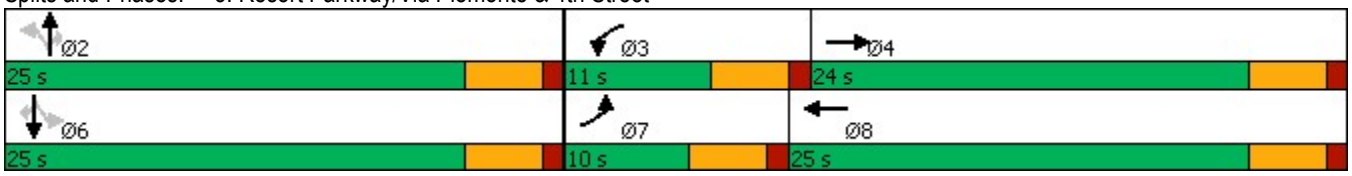
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	20	716	6	42	983	28	32	4	36	48	4	23
Future Volume (vph)	20	716	6	42	983	28	32	4	36	48	4	23
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	22	770	6	45	1057	30	34	4	39	52	4	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	776	0	45	1087	0	34	4	39	0	56	25

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	20	716	42	983	32	4	36	48	4	23
Future Volume (vph)	20	716	42	983	32	4	36	48	4	23
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8		2			6	
Permitted Phases					2		2	6		6
Detector Phase	7	4	3	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	10.0	24.0	11.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (%)	16.7%	40.0%	18.3%	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	5.9	14.8	6.4	16.8	7.2	7.2	7.2		7.2	7.2
Actuated g/C Ratio	0.17	0.42	0.18	0.48	0.21	0.21	0.21		0.21	0.21
v/c Ratio	0.04	0.29	0.15	0.45	0.13	0.01	0.09		0.20	0.06
Control Delay	17.2	8.0	17.2	7.2	15.9	14.8	0.4		16.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	17.2	8.0	17.2	7.2	15.9	14.8	0.4		16.3	0.3
LOS	B	A	B	A	B	B	A		B	A
Approach Delay		8.2		7.6		8.0			11.4	
Approach LOS		A		A		A			B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 35	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 8.0	Intersection LOS: A
Intersection Capacity Utilization 44.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	22	776	45	1087	34	4	39	56	25
v/c Ratio	0.04	0.29	0.15	0.45	0.13	0.01	0.09	0.20	0.06
Control Delay	17.2	8.0	17.2	7.2	15.9	14.8	0.4	16.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.2	8.0	17.2	7.2	15.9	14.8	0.4	16.3	0.3
Queue Length 50th (ft)	1	17	6	34	5	1	0	8	0
Queue Length 95th (ft)	10	59	35	109	26	7	1	38	0
Internal Link Dist (ft)		362		428		302		378	
Turn Bay Length (ft)	220		125		115		115		110
Base Capacity (vph)	513	3794	331	3254	792	1160	1027	858	1027
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.20	0.14	0.33	0.04	0.00	0.04	0.07	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	716	6	42	983	28	32	4	36	48	4	23
Future Volume (veh/h)	20	716	6	42	983	28	32	4	36	48	4	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1772	1870	1870	1772	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	22	770	6	45	1057	30	34	4	39	52	4	25
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	86	2518	20	87	2058	58	378	288	244	406	24	244
Arrive On Green	0.03	0.38	0.38	0.05	0.40	0.40	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	3092	6635	52	1688	5104	145	1308	1870	1585	1251	154	1585
Grp Volume(v), veh/h	22	560	216	45	705	382	34	4	39	56	0	25
Grp Sat Flow(s),veh/h/ln	1546	1609	1861	1688	1702	1844	1308	1870	1585	1405	0	1585
Q Serve(g_s), s	0.2	2.6	2.7	0.8	5.1	5.1	0.8	0.1	0.7	0.9	0.0	0.4
Cycle Q Clear(g_c), s	0.2	2.6	2.7	0.8	5.1	5.1	1.9	0.1	0.7	1.1	0.0	0.4
Prop In Lane	1.00		0.03	1.00		0.08	1.00		1.00	0.93		1.00
Lane Grp Cap(c), veh/h	86	1832	706	87	1373	744	378	288	244	430	0	244
V/C Ratio(X)	0.26	0.31	0.31	0.52	0.51	0.51	0.09	0.01	0.16	0.13	0.00	0.10
Avail Cap(c_a), veh/h	523	2895	1116	337	2147	1163	1002	1179	1000	1093	0	1000
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.5	7.1	7.1	15.0	7.3	7.3	12.9	11.7	11.9	12.1	0.0	11.8
Incr Delay (d2), s/veh	1.6	0.1	0.2	4.7	0.3	0.6	0.1	0.0	0.3	0.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.6	0.7	0.4	1.2	1.3	0.2	0.0	0.2	0.3	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.0	7.2	7.3	19.8	7.6	7.9	13.0	11.7	12.2	12.2	0.0	12.0
LnGrp LOS	B	A	A	B	A	A	B	B	B	B	A	B
Approach Vol, veh/h		798			1132			77			81	
Approach Delay, s/veh		7.5			8.2			12.6			12.2	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	6.2	16.8		9.5	5.4	17.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		20.5	6.5	19.5		20.5	5.5	20.5				
Max Q Clear Time (g_c+I1), s		3.9	2.8	4.7		3.1	2.2	7.1				
Green Ext Time (p_c), s		0.2	0.0	4.5		0.3	0.0	6.0				

Intersection Summary	
HCM 6th Ctrl Delay	8.2
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.995					0.865
Flt Protected						
Satd. Flow (prot)	5060	0	0	5085	0	1611
Flt Permitted						
Satd. Flow (perm)	5060	0	0	5085	0	1611
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	774	29	0	993	0	24
Future Volume (vph)	774	29	0	993	0	24
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	841	32	0	1079	0	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	873	0	0	1079	0	26

Intersection Summary

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	774	29	0	993	0	24
Future Vol, veh/h	774	29	0	993	0	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	841	32	0	1079	0	26

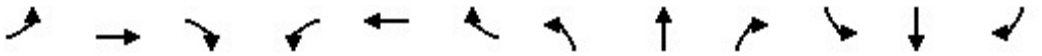
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	437
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	485
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	485
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	485	-	-	-
HCM Lane V/C Ratio	0.054	-	-	-
HCM Control Delay (s)	12.8	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	5085	1583	3072	5085	1583	3072	6408	1583	3072	6312	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	5085	1583	3072	5085	1583	3072	6408	1583	3072	6312	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			219			278			73		29	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



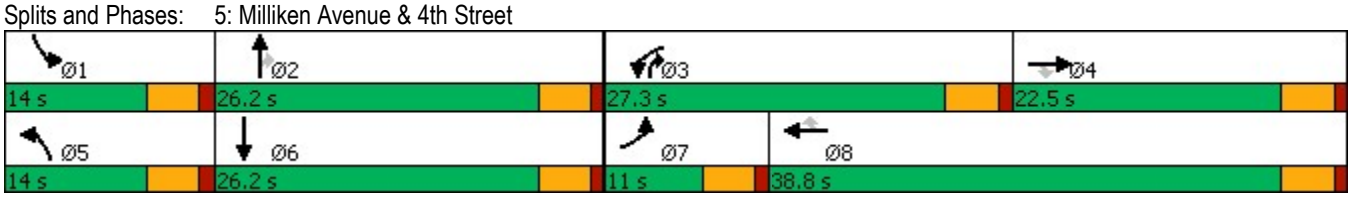
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	205	572	226	650	1669	549	278	1327	214	277	1154	133
Future Volume (vph)	205	572	226	650	1669	549	278	1327	214	277	1154	133
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	220	615	243	699	1795	590	299	1427	230	298	1241	143
Shared Lane Traffic (%)												
Lane Group Flow (vph)	220	615	243	699	1795	590	299	1427	230	298	1384	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	205	572	226	650	1669	549	278	1327	214	277	1154
Future Volume (vph)	205	572	226	650	1669	549	278	1327	214	277	1154
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	11.0	22.5	22.5	27.3	38.8	38.8	14.0	26.2	27.3	14.0	26.2
Total Split (%)	12.2%	25.0%	25.0%	30.3%	43.1%	43.1%	15.6%	29.1%	30.3%	15.6%	29.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	6.5	18.4	18.4	22.4	34.3	34.3	9.5	21.7	48.6	9.5	21.7
Actuated g/C Ratio	0.07	0.20	0.20	0.25	0.38	0.38	0.11	0.24	0.54	0.11	0.24
v/c Ratio	1.00	0.59	0.49	0.91	0.93	0.76	0.92	0.92	0.26	0.92	0.90
Control Delay	103.6	35.2	9.9	51.2	36.5	19.9	75.4	44.7	8.1	74.8	41.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.6	35.2	9.9	51.2	36.5	19.9	75.4	44.7	8.1	74.8	41.4
LOS	F	D	A	D	D	B	E	D	A	E	D
Approach Delay		43.5			36.7			45.1			47.4
Approach LOS		D			D			D			D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 42.0	Intersection LOS: D
Intersection Capacity Utilization 81.8%	ICU Level of Service D
Analysis Period (min) 15	

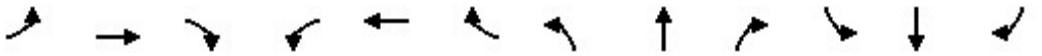
Splits and Phases: 5: Milliken Avenue & 4th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	220	615	243	699	1795	590	299	1427	230	298	1384
v/c Ratio	1.00	0.59	0.49	0.91	0.93	0.76	0.92	0.92	0.26	0.92	0.90
Control Delay	103.6	35.2	9.9	51.2	36.5	19.9	75.4	44.7	8.1	74.8	41.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.6	35.2	9.9	51.2	36.5	19.9	75.4	44.7	8.1	74.8	41.4
Queue Length 50th (ft)	65	117	11	197	350	154	88	230	42	88	217
Queue Length 95th (ft)	#139	156	75	#300	#456	297	#165	#300	82	#164	#281
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	221	1041	497	778	1937	775	324	1545	895	324	1543
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.59	0.49	0.90	0.93	0.76	0.92	0.92	0.26	0.92	0.90

Intersection Summary

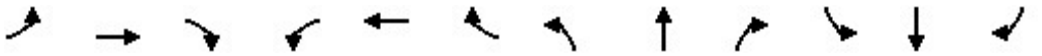
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	572	226	650	1669	549	278	1327	214	277	1154	133
Future Volume (veh/h)	205	572	226	650	1669	549	278	1327	214	277	1154	133
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	220	615	243	699	1795	590	299	1427	230	298	1241	143
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	223	1059	329	761	1947	604	326	1550	772	326	1420	163
Arrive On Green	0.07	0.21	0.21	0.25	0.38	0.38	0.11	0.24	0.24	0.11	0.24	0.24
Sat Flow, veh/h	3092	5106	1585	3092	5106	1585	3092	6434	1585	3092	5898	677
Grp Volume(v), veh/h	220	615	243	699	1795	590	299	1427	230	298	1014	370
Grp Sat Flow(s),veh/h/ln	1546	1702	1585	1546	1702	1585	1546	1609	1585	1546	1609	1749
Q Serve(g_s), s	6.4	9.8	12.9	19.8	30.2	33.0	8.6	19.5	7.8	8.6	18.2	18.3
Cycle Q Clear(g_c), s	6.4	9.8	12.9	19.8	30.2	33.0	8.6	19.5	7.8	8.6	18.2	18.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.39
Lane Grp Cap(c), veh/h	223	1059	329	761	1947	604	326	1550	772	326	1162	421
V/C Ratio(X)	0.98	0.58	0.74	0.92	0.92	0.98	0.92	0.92	0.30	0.91	0.87	0.88
Avail Cap(c_a), veh/h	223	1059	329	784	1947	604	326	1552	773	326	1164	422
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.7	32.1	33.4	33.0	26.6	27.4	39.8	33.3	13.8	39.8	32.8	32.9
Incr Delay (d2), s/veh	55.7	0.8	8.6	15.5	7.8	30.6	29.3	9.4	0.2	28.7	7.5	18.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	4.0	5.6	8.8	13.0	16.9	4.6	8.4	2.7	4.5	7.7	9.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	97.4	32.9	42.0	48.6	34.4	58.0	69.2	42.7	14.1	68.6	40.3	51.4
LnGrp LOS	F	C	D	D	C	E	E	D	B	E	D	D
Approach Vol, veh/h		1078			3084			1956			1682	
Approach Delay, s/veh		48.1			42.1			43.4			47.8	
Approach LOS		D			D			D			D	

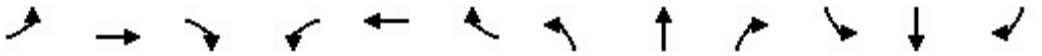
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	26.2	26.6	23.2	14.0	26.2	11.0	38.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	21.7	22.8	18.0	9.5	21.7	6.5	34.3
Max Q Clear Time (g_c+I1), s	10.6	21.5	21.8	14.9	10.6	20.3	8.4	35.0
Green Ext Time (p_c), s	0.0	0.2	0.3	1.5	0.0	1.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	44.5
HCM 6th LOS	D



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.901	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	5085	1583	3072	5085	1583	1770	3539	1583	1770	3055	1441
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	5085	1583	3072	5085	1583	1770	3539	1583	1770	3055	1441
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136			136			136		208	208
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



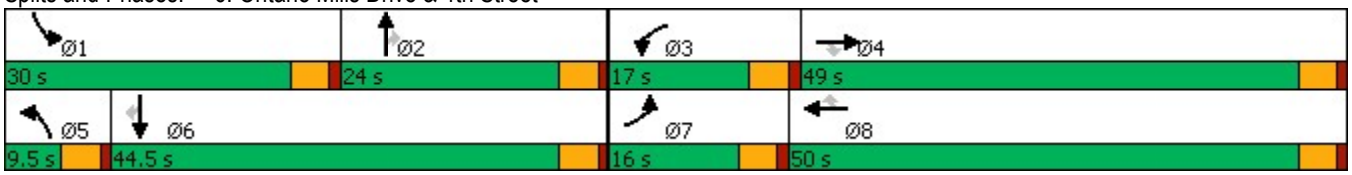
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	401	519	83	154	1821	184	101	99	109	205	312	1227
Future Volume (vph)	401	519	83	154	1821	184	101	99	109	205	312	1227
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	461	597	95	177	2093	211	116	114	125	236	359	1410
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	461	597	95	177	2093	211	116	114	125	236	1064	705

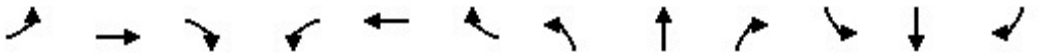
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	401	519	83	154	1821	184	101	99	109	205	312	1227
Future Volume (vph)	401	519	83	154	1821	184	101	99	109	205	312	1227
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	16.0	49.0	49.0	17.0	50.0	50.0	9.5	24.0	24.0	30.0	44.5	44.5
Total Split (%)	13.3%	40.8%	40.8%	14.2%	41.7%	41.7%	7.9%	20.0%	20.0%	25.0%	37.1%	37.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	11.5	45.7	45.7	11.3	45.5	45.5	5.0	24.4	24.4	20.6	40.0	40.0
Actuated g/C Ratio	0.10	0.38	0.38	0.09	0.38	0.38	0.04	0.20	0.20	0.17	0.33	0.33
v/c Ratio	1.57	0.31	0.14	0.61	1.09	0.31	1.59	0.16	0.29	0.78	1.10dr	1.14
Control Delay	307.4	26.8	1.8	61.4	84.0	10.8	356.9	41.7	7.9	64.6	44.3	108.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	307.4	26.8	1.8	61.4	84.0	10.8	356.9	41.7	7.9	64.6	44.3	108.0
LOS	F	C	A	E	F	B	F	D	A	E	D	F
Approach Delay		137.0			76.2			132.8			69.1	
Approach LOS		F			E			F			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.59	
Intersection Signal Delay: 88.8	Intersection LOS: F
Intersection Capacity Utilization 102.7%	ICU Level of Service G
Analysis Period (min) 15	
dr Defacto Right Lane. Recode with 1 though lane as a right lane.	

Splits and Phases: 6: Ontario Mills Drive & 4th Street





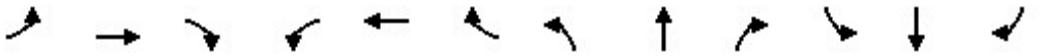
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	461	597	95	177	2093	211	116	114	125	236	1064	705
v/c Ratio	1.57	0.31	0.14	0.61	1.09	0.31	1.59	0.16	0.29	0.78	1.10dr	1.14
Control Delay	307.4	26.8	1.8	61.4	84.0	10.8	356.9	41.7	7.9	64.6	44.3	108.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	307.4	26.8	1.8	61.4	84.0	10.8	356.9	41.7	7.9	64.6	44.3	108.0
Queue Length 50th (ft)	~260	119	0	68	~666	38	~128	38	0	175	363	~575
Queue Length 95th (ft)	#350	146	11	102	#717	88	#239	66	42	245	#470	#784
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	294	1935	686	320	1928	684	73	719	430	376	1157	619
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.57	0.31	0.14	0.55	1.09	0.31	1.59	0.16	0.29	0.63	0.92	1.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



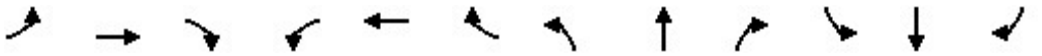
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	401	519	83	154	1821	184	101	99	109	205	312	1227
Future Volume (veh/h)	401	519	83	154	1821	184	101	99	109	205	312	1227
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	461	597	95	177	2093	211	116	114	125	236	359	1410
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	296	2047	635	229	1936	601	74	800	357	267	623	1057
Arrive On Green	0.10	0.40	0.40	0.07	0.38	0.38	0.04	0.23	0.23	0.15	0.33	0.33
Sat Flow, veh/h	3092	5106	1585	3092	5106	1585	1781	3554	1585	1781	1870	3170
Grp Volume(v), veh/h	461	597	95	177	2093	211	116	114	125	236	359	1410
Grp Sat Flow(s),veh/h/ln	1546	1702	1585	1546	1702	1585	1781	1777	1585	1781	1870	1585
Q Serve(g_s), s	11.5	9.5	4.6	6.7	45.5	11.4	5.0	3.1	8.0	15.6	19.0	40.0
Cycle Q Clear(g_c), s	11.5	9.5	4.6	6.7	45.5	11.4	5.0	3.1	8.0	15.6	19.0	40.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	296	2047	635	229	1936	601	74	800	357	267	623	1057
V/C Ratio(X)	1.56	0.29	0.15	0.77	1.08	0.35	1.56	0.14	0.35	0.88	0.58	1.33
Avail Cap(c_a), veh/h	296	2047	635	322	1936	601	74	800	357	379	623	1057
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.2	24.4	22.9	54.5	37.2	26.7	57.5	37.2	39.1	50.0	33.0	40.0
Incr Delay (d2), s/veh	266.1	0.1	0.1	7.3	46.3	0.3	308.6	0.1	0.6	16.1	1.3	157.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.4	3.9	1.7	2.9	26.8	4.4	8.6	1.4	3.2	8.1	8.8	38.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	320.3	24.5	23.0	61.8	83.5	27.0	366.1	37.3	39.7	66.1	34.3	197.0
LnGrp LOS	F	C	C	E	F	C	F	D	D	E	C	F
Approach Vol, veh/h		1153			2481			355			2005	
Approach Delay, s/veh		142.6			77.2			145.6			152.4	
Approach LOS		F			E			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.5	31.5	13.4	52.6	9.5	44.5	16.0	50.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	25.5	19.5	12.5	44.5	5.0	40.0	11.5	45.5
Max Q Clear Time (g_c+I1), s	17.6	10.0	8.7	11.5	7.0	42.0	13.5	47.5
Green Ext Time (p_c), s	0.4	0.7	0.2	4.9	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	119.0
HCM 6th LOS	F

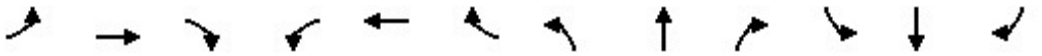
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.983			0.892				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.966	
Satd. Flow (prot)	3072	5085	1583	1676	4999	0	1676	3157	0	1593	1709	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.966	
Satd. Flow (perm)	3072	5085	1583	1676	4999	0	1676	3157	0	1593	1709	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127		25			84				334
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



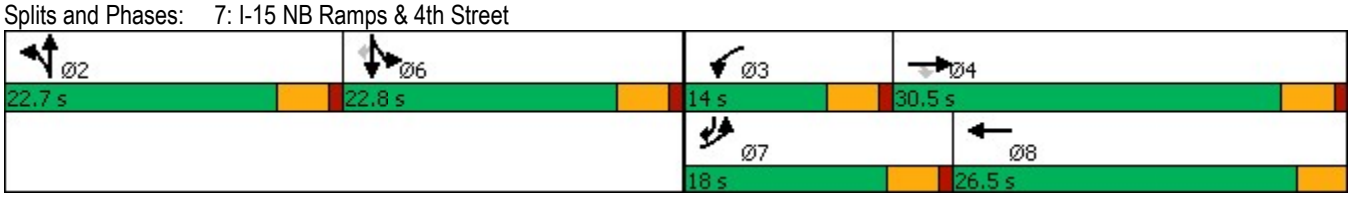
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	303	477	108	63	666	87	154	31	80	519	92	1346
Future Volume (vph)	303	477	108	63	666	87	154	31	80	519	92	1346
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	319	502	114	66	701	92	162	33	84	546	97	1417
Shared Lane Traffic (%)										42%		
Lane Group Flow (vph)	319	502	114	66	793	0	162	117	0	317	326	1417

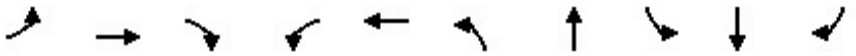
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	303	477	108	63	666	154	31	519	92	1346
Future Volume (vph)	303	477	108	63	666	154	31	519	92	1346
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	18.0	30.5	30.5	14.0	26.5	22.7	22.7	22.8	22.8	18.0
Total Split (%)	20.0%	33.9%	33.9%	15.6%	29.4%	25.2%	25.2%	25.3%	25.3%	20.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	13.6	26.1	26.1	8.0	19.2	12.9	12.9	18.4	18.4	36.6
Actuated g/C Ratio	0.17	0.32	0.32	0.10	0.24	0.16	0.16	0.23	0.23	0.45
v/c Ratio	0.62	0.31	0.19	0.40	0.66	0.61	0.20	0.88	0.84	1.03
Control Delay	38.9	23.0	4.8	43.8	30.4	42.5	12.5	59.1	53.1	53.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.9	23.0	4.8	43.8	30.4	42.5	12.5	59.1	53.1	53.3
LOS	D	C	A	D	C	D	B	E	D	D
Approach Delay		26.2			31.4		29.9		54.1	
Approach LOS		C			C		C		D	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 81.3	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.03	
Intersection Signal Delay: 41.5	Intersection LOS: D
Intersection Capacity Utilization 84.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street



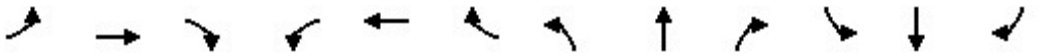


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	319	502	114	66	793	162	117	317	326	1417
v/c Ratio	0.62	0.31	0.19	0.40	0.66	0.61	0.20	0.88	0.84	1.03
Control Delay	38.9	23.0	4.8	43.8	30.4	42.5	12.5	59.1	53.1	53.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.9	23.0	4.8	43.8	30.4	42.5	12.5	59.1	53.1	53.3
Queue Length 50th (ft)	79	73	0	32	129	79	7	167	170	~398
Queue Length 95th (ft)	135	112	32	77	183	144	30	#365	#364	#611
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	514	1706	615	197	1443	378	777	361	387	1371
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.29	0.19	0.34	0.55	0.43	0.15	0.88	0.84	1.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	303	477	108	63	666	87	154	31	80	519	92	1346
Future Volume (veh/h)	303	477	108	63	666	87	154	31	80	519	92	1346
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1772	1870	1870	1772	1870	1870	1772	1870	1772
Adj Flow Rate, veh/h	319	502	114	66	701	92	162	33	84	615	0	1417
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	414	1570	487	86	1027	134	221	233	208	868	0	1175
Arrive On Green	0.13	0.31	0.31	0.05	0.22	0.22	0.13	0.13	0.13	0.26	0.00	0.26
Sat Flow, veh/h	3092	5106	1585	1688	4573	595	1688	1777	1585	3375	0	3003
Grp Volume(v), veh/h	319	502	114	66	520	273	162	33	84	615	0	1417
Grp Sat Flow(s),veh/h/ln	1546	1702	1585	1688	1702	1763	1688	1777	1585	1688	0	1502
Q Serve(g_s), s	7.1	5.4	3.8	2.7	10.0	10.1	6.6	1.2	3.5	11.8	0.0	18.3
Cycle Q Clear(g_c), s	7.1	5.4	3.8	2.7	10.0	10.1	6.6	1.2	3.5	11.8	0.0	18.3
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	414	1570	487	86	765	396	221	233	208	868	0	1175
V/C Ratio(X)	0.77	0.32	0.23	0.76	0.68	0.69	0.73	0.14	0.40	0.71	0.00	1.21
Avail Cap(c_a), veh/h	587	1865	579	225	1100	570	432	454	405	868	0	1175
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.8	18.9	18.4	33.3	25.3	25.3	29.7	27.4	28.4	24.0	0.0	21.7
Incr Delay (d2), s/veh	4.0	0.1	0.2	13.0	1.1	2.1	4.6	0.3	1.3	2.7	0.0	101.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	2.0	1.4	1.4	3.9	4.2	2.8	0.5	1.3	4.8	0.0	25.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.7	19.0	18.6	46.3	26.3	27.4	34.3	27.6	29.6	26.7	0.0	122.7
LnGrp LOS	C	B	B	D	C	C	C	C	C	C	A	F
Approach Vol, veh/h		935			859			279			2032	
Approach Delay, s/veh		24.0			28.2			32.1			93.6	
Approach LOS		C			C			C			F	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		13.8	8.1	26.4		22.8	14.0	20.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		18.2	9.5	26.0		18.3	13.5	* 23				
Max Q Clear Time (g_c+I1), s		8.6	4.7	7.4		20.3	9.1	12.1				
Green Ext Time (p_c), s		0.8	0.0	3.6		0.0	0.5	3.9				

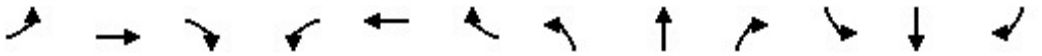
Intersection Summary	
HCM 6th Ctrl Delay	59.9
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
User approved changes to right turn type.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1600	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.903				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3196	0	4202	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3196	0	4202	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		127				182			182			182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



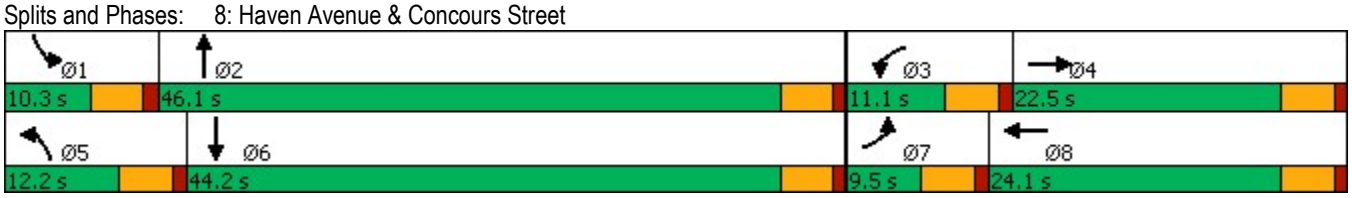
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	29	63	114	229	83	25	99	2535	201	139	1956	61
Future Volume (vph)	29	63	114	229	83	25	99	2535	201	139	1956	61
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	32	70	127	254	92	28	110	2817	223	154	2173	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	197	0	254	92	28	110	2817	223	154	2173	68

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	29	63	229	83	25	99	2535	201	139	1956	61
Future Volume (vph)	29	63	229	83	25	99	2535	201	139	1956	61
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	11.1	24.1		12.2	46.1		10.3	44.2	
Total Split (%)	10.6%	25.0%	12.3%	26.8%		13.6%	51.2%		11.4%	49.1%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.0	7.4	6.6	14.8	79.5	7.3	41.6	79.5	5.8	42.3	79.5
Actuated g/C Ratio	0.06	0.09	0.08	0.19	1.00	0.09	0.52	1.00	0.07	0.53	1.00
v/c Ratio	0.17	0.48	0.73	0.14	0.02	0.39	0.84	0.14	0.69	0.64	0.04
Control Delay	38.1	17.5	49.5	29.6	0.0	38.6	19.3	0.2	53.8	15.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.1	17.5	49.5	29.6	0.0	38.6	19.3	0.2	53.8	15.2	0.0
LOS	D	B	D	C	A	D	B	A	D	B	A
Approach Delay		20.4		40.9			18.6			17.2	
Approach LOS		C		D			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 79.5	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 19.5	Intersection LOS: B
Intersection Capacity Utilization 66.8%	ICU Level of Service C
Analysis Period (min) 15	

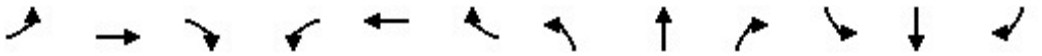
Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	32	197	254	92	28	110	2817	223	154	2173	68
v/c Ratio	0.17	0.48	0.73	0.14	0.02	0.39	0.84	0.14	0.69	0.64	0.04
Control Delay	38.1	17.5	49.5	29.6	0.0	38.6	19.3	0.2	53.8	15.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.1	17.5	49.5	29.6	0.0	38.6	19.3	0.2	53.8	15.2	0.0
Queue Length 50th (ft)	7	17	44	18	0	26	320	0	39	222	0
Queue Length 95th (ft)	22	47	#82	43	0	53	408	0	#85	285	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	193	822	349	873	1583	297	3356	1583	224	3411	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.24	0.73	0.11	0.02	0.37	0.84	0.14	0.69	0.64	0.04

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



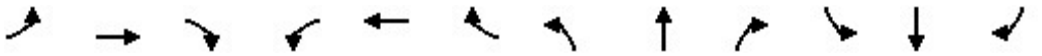
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	63	114	229	83	25	99	2535	201	139	1956	61
Future Volume (veh/h)	29	63	114	229	83	25	99	2535	201	139	1956	61
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1575	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	32	70	127	254	92	0	110	2817	0	154	2173	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	98	197	176	347	573		176	3295		220	3387	
Arrive On Green	0.03	0.11	0.11	0.08	0.16	0.00	0.06	0.51	0.00	0.07	0.53	0.00
Sat Flow, veh/h	3092	1777	1585	4230	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	32	70	127	254	92	0	110	2817	0	154	2173	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1410	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	0.8	2.9	6.2	4.7	1.8	0.0	2.8	30.6	0.0	3.9	19.4	0.0
Cycle Q Clear(g_c), s	0.8	2.9	6.2	4.7	1.8	0.0	2.8	30.6	0.0	3.9	19.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	98	197	176	347	573		176	3295		220	3387	
V/C Ratio(X)	0.33	0.35	0.72	0.73	0.16		0.63	0.85		0.70	0.64	
Avail Cap(c_a), veh/h	192	397	354	347	865		296	3325		223	3387	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.1	33.1	34.6	36.1	29.1	0.0	37.1	17.0	0.0	36.5	13.6	0.0
Incr Delay (d2), s/veh	1.9	1.1	5.5	7.7	0.1	0.0	3.6	2.4	0.0	9.2	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.3	2.6	1.8	0.8	0.0	1.1	10.6	0.0	1.7	6.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.0	34.2	40.0	43.8	29.2	0.0	40.8	19.4	0.0	45.7	14.0	0.0
LnGrp LOS	D	C	D	D	C		D	B		D	B	
Approach Vol, veh/h		229			346	A		2927	A		2327	A
Approach Delay, s/veh		38.2			39.9			20.2			16.1	
Approach LOS		D			D			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	45.7	11.1	13.4	9.1	46.9	7.1	17.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.8	41.6	6.6	18.0	7.7	39.7	5.0	19.6
Max Q Clear Time (g_c+I1), s	5.9	32.6	6.7	8.2	4.8	21.4	2.8	3.8
Green Ext Time (p_c), s	0.0	8.6	0.0	0.7	0.1	14.7	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	20.5
HCM 6th LOS	C

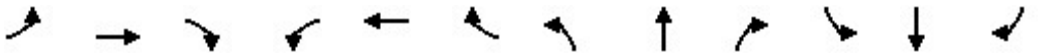
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1900	1900	1900	1900	1800	1900	1900	1800	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.990			0.977			0.994			0.982	
Flt Protected	0.950	0.956			0.968		0.950			0.950		
Satd. Flow (prot)	1593	1675	0	0	1762	0	1676	5055	0	1676	4994	0
Flt Permitted	0.950	0.956					0.950			0.950		
Satd. Flow (perm)	1593	1675	0	0	1820	0	1676	5055	0	1676	4994	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		143			1			7			29	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



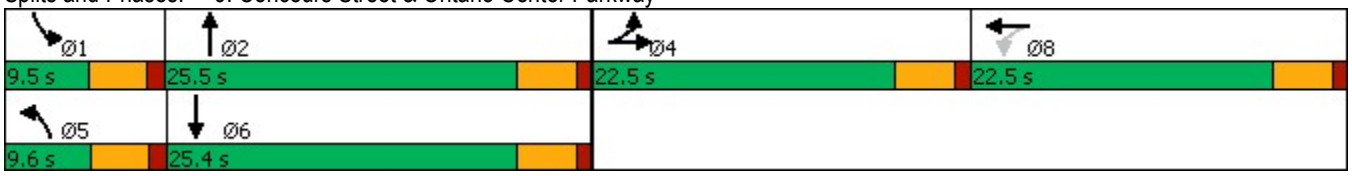
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	101	0	4	4	1	1	64	693	29	1	956	129
Future Volume (vph)	101	0	4	4	1	1	64	693	29	1	956	129
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	112	0	4	4	1	1	71	770	32	1	1062	143
Shared Lane Traffic (%)	48%											
Lane Group Flow (vph)	58	58	0	0	6	0	71	802	0	1	1205	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	101	0	4	1	64	693	1	956
Future Volume (vph)	101	0	4	1	64	693	1	956
Turn Type	Split	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	4	4		8	5	2	1	6
Permitted Phases			8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	9.6	25.5	9.5	25.4
Total Split (%)	28.1%	28.1%	28.1%	28.1%	12.0%	31.9%	11.9%	31.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	7.4	7.4		6.0	5.3	31.9	5.2	26.2
Actuated g/C Ratio	0.16	0.16		0.13	0.11	0.67	0.11	0.55
v/c Ratio	0.23	0.15		0.03	0.38	0.24	0.01	0.44
Control Delay	22.3	0.8		20.8	30.1	6.5	23.0	10.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	0.8		20.8	30.1	6.5	23.0	10.6
LOS	C	A		C	C	A	C	B
Approach Delay		11.6		20.8		8.5		10.6
Approach LOS		B		C		A		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 47.6	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 9.8	Intersection LOS: A
Intersection Capacity Utilization 40.9%	ICU Level of Service A
Analysis Period (min) 15	

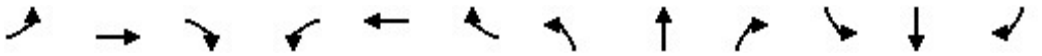
Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	58	58	6	71	802	1	1205
v/c Ratio	0.23	0.15	0.03	0.38	0.24	0.01	0.44
Control Delay	22.3	0.8	20.8	30.1	6.5	23.0	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	0.8	20.8	30.1	6.5	23.0	10.6
Queue Length 50th (ft)	14	0	1	18	23	0	76
Queue Length 95th (ft)	49	0	11	#70	110	5	174
Internal Link Dist (ft)		319	68		111		176
Turn Bay Length (ft)	170			115		120	
Base Capacity (vph)	630	749	720	187	3391	184	2765
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.08	0.01	0.38	0.24	0.01	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



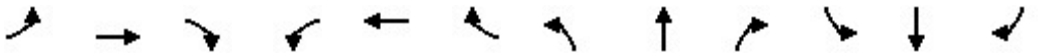
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	101	0	4	4	1	1	64	693	29	1	956	129
Future Volume (veh/h)	101	0	4	4	1	1	64	693	29	1	956	129
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1870	1870	1870	1870	1870	1772	1870	1870	1772	1870	1870
Adj Flow Rate, veh/h	116	0	0	4	1	1	71	770	32	1	1062	143
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	305	169	0	9	2	2	115	2281	95	4	1761	237
Arrive On Green	0.09	0.00	0.00	0.01	0.01	0.01	0.07	0.45	0.45	0.00	0.39	0.39
Sat Flow, veh/h	3375	1870	0	1173	293	293	1688	5029	208	1688	4552	612
Grp Volume(v), veh/h	116	0	0	6	0	0	71	521	281	1	794	411
Grp Sat Flow(s),veh/h/ln	1688	1870	0	1759	0	0	1688	1702	1833	1688	1702	1760
Q Serve(g_s), s	1.3	0.0	0.0	0.1	0.0	0.0	1.6	4.0	4.0	0.0	7.5	7.5
Cycle Q Clear(g_c), s	1.3	0.0	0.0	0.1	0.0	0.0	1.6	4.0	4.0	0.0	7.5	7.5
Prop In Lane	1.00		0.00	0.67		0.17	1.00		0.11	1.00		0.35
Lane Grp Cap(c), veh/h	305	169	0	14	0	0	115	1544	831	4	1317	681
V/C Ratio(X)	0.38	0.00	0.00	0.42	0.00	0.00	0.62	0.34	0.34	0.24	0.60	0.60
Avail Cap(c_a), veh/h	1508	836	0	786	0	0	214	1774	955	209	1766	913
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.3	0.0	0.0	19.9	0.0	0.0	18.3	7.1	7.1	20.1	9.9	9.9
Incr Delay (d2), s/veh	0.8	0.0	0.0	18.8	0.0	0.0	5.3	0.1	0.2	27.0	0.4	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	0.1	0.0	0.0	0.7	1.0	1.1	0.0	2.1	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.1	0.0	0.0	38.7	0.0	0.0	23.6	7.2	7.3	47.1	10.3	10.7
LnGrp LOS	B	A	A	D	A	A	C	A	A	D	B	B
Approach Vol, veh/h		116			6			873			1206	
Approach Delay, s/veh		18.1			38.7			8.6			10.5	
Approach LOS		B			D			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	22.8		8.1	7.2	20.1		4.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	21.0		18.0	5.1	20.9		18.0				
Max Q Clear Time (g_c+I1), s	2.0	6.0		3.3	3.6	9.5		2.1				
Green Ext Time (p_c), s	0.0	4.6		0.3	0.0	6.1		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		10.2
HCM 6th LOS		B

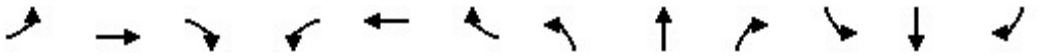
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			234			234			234			357
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



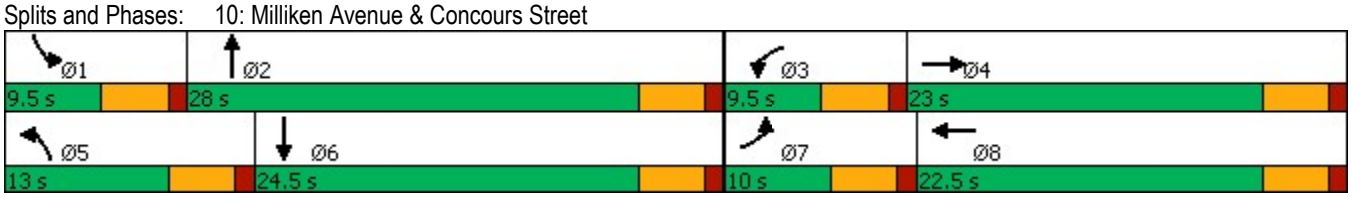
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	128	34	141	68	109	55	252	1314	83	103	1259	344
Future Volume (vph)	128	34	141	68	109	55	252	1314	83	103	1259	344
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	149	40	164	79	127	64	293	1528	97	120	1464	400
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	40	164	79	127	64	293	1528	97	120	1464	400

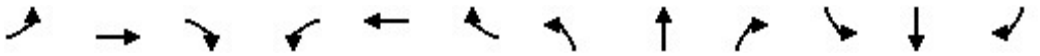
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	128	34	141	68	109	55	252	1314	83	103	1259	344
Future Volume (vph)	128	34	141	68	109	55	252	1314	83	103	1259	344
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	10.0	23.0		9.5	22.5		13.0	28.0		9.5	24.5	
Total Split (%)	14.3%	32.9%		13.6%	32.1%		18.6%	40.0%		13.6%	35.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	5.8	9.4	54.9	7.6	7.6	54.9	8.7	28.2	54.9	5.3	20.3	54.9
Actuated g/C Ratio	0.11	0.17	1.00	0.14	0.14	1.00	0.16	0.51	1.00	0.10	0.37	1.00
v/c Ratio	0.46	0.07	0.10	0.19	0.26	0.04	0.60	0.46	0.06	0.41	0.62	0.25
Control Delay	31.3	22.4	0.1	25.4	24.9	0.1	30.4	13.4	0.1	31.0	17.2	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	22.4	0.1	25.4	24.9	0.1	30.4	13.4	0.1	31.0	17.2	0.4
LOS	C	C	A	C	C	A	C	B	A	C	B	A
Approach Delay		15.8			19.1			15.3			14.7	
Approach LOS		B			B			B			B	

Intersection Summary		
Cycle Length: 70		
Actuated Cycle Length: 54.9		
Natural Cycle: 65		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.62		
Intersection Signal Delay: 15.3	Intersection LOS: B	
Intersection Capacity Utilization 48.3%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 10: Milliken Avenue & Concours Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	149	40	164	79	127	64	293	1528	97	120	1464	400
v/c Ratio	0.46	0.07	0.10	0.19	0.26	0.04	0.60	0.46	0.06	0.41	0.62	0.25
Control Delay	31.3	22.4	0.1	25.4	24.9	0.1	30.4	13.4	0.1	31.0	17.2	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	22.4	0.1	25.4	24.9	0.1	30.4	13.4	0.1	31.0	17.2	0.4
Queue Length 50th (ft)	26	6	0	10	22	0	52	121	0	21	128	0
Queue Length 95th (ft)	51	17	0	31	41	0	#88	153	0	42	161	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	323	1252	1583	422	1218	1583	499	3291	1583	293	2451	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.03	0.10	0.19	0.10	0.04	0.59	0.46	0.06	0.41	0.60	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

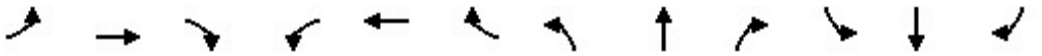
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	128	34	141	68	109	55	252	1314	83	103	1259	344
Future Volume (veh/h)	128	34	141	68	109	55	252	1314	83	103	1259	344
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	149	40	0	79	127	0	293	1528	0	120	1464	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	264	404		203	334		406	2528		246	2194	
Arrive On Green	0.09	0.11	0.00	0.07	0.09	0.00	0.13	0.39	0.00	0.08	0.34	0.00
Sat Flow, veh/h	3092	3554	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	149	40	0	79	127	0	293	1528	0	120	1464	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	2.4	0.5	0.0	1.3	1.7	0.0	4.7	9.8	0.0	1.9	10.0	0.0
Cycle Q Clear(g_c), s	2.4	0.5	0.0	1.3	1.7	0.0	4.7	9.8	0.0	1.9	10.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	264	404		203	334		406	2528		246	2194	
V/C Ratio(X)	0.56	0.10		0.39	0.38		0.72	0.60		0.49	0.67	
Avail Cap(c_a), veh/h	329	1272		299	1238		509	2926		299	2490	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.7	20.5	0.0	23.2	22.0	0.0	21.5	12.5	0.0	22.8	14.5	0.0
Incr Delay (d2), s/veh	1.9	0.1	0.0	1.2	0.7	0.0	3.7	0.3	0.0	1.5	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.2	0.0	0.5	0.7	0.0	1.8	3.0	0.0	0.7	3.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.6	20.6	0.0	24.4	22.7	0.0	25.3	12.8	0.0	24.3	15.1	0.0
LnGrp LOS	C	C		C	C		C	B		C	B	
Approach Vol, veh/h		189	A		206	A		1821	A		1584	A
Approach Delay, s/veh		23.8			23.3			14.8			15.8	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	24.8	7.9	10.4	11.3	22.1	8.9	9.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	23.5	5.0	18.5	8.5	20.0	5.5	18.0
Max Q Clear Time (g_c+I1), s	3.9	11.8	3.3	2.5	6.7	12.0	4.4	3.7
Green Ext Time (p_c), s	0.0	7.9	0.0	0.1	0.2	5.6	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	16.1
HCM 6th LOS	B

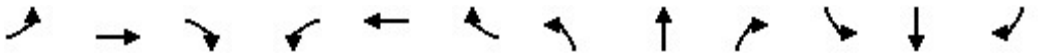
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1600	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3539	1583	4202	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3539	1583	4202	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			236			434			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



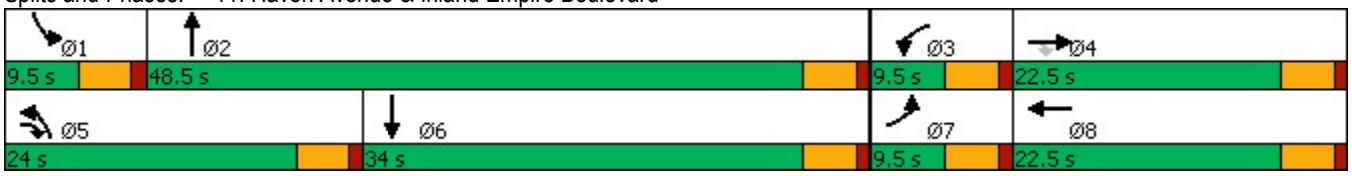
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	90	137	335	165	144	29	644	2927	906	73	1925	128
Future Volume (vph)	90	137	335	165	144	29	644	2927	906	73	1925	128
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	97	147	360	177	155	31	692	3147	974	78	2070	138
Shared Lane Traffic (%)												
Lane Group Flow (vph)	97	147	360	177	155	31	692	3147	974	78	2070	138

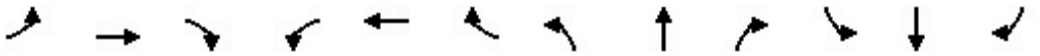
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	137	335	165	144	29	644	2927	906	73	1925	128
Future Volume (vph)	90	137	335	165	144	29	644	2927	906	73	1925	128
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	24.0	9.5	22.5		24.0	48.5		9.5	34.0	
Total Split (%)	10.6%	25.0%	26.7%	10.6%	25.0%		26.7%	53.9%		10.6%	37.8%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.0	8.9	32.9	5.0	10.8	80.9	19.5	46.0	80.9	5.0	29.5	80.9
Actuated g/C Ratio	0.06	0.11	0.41	0.06	0.13	1.00	0.24	0.57	1.00	0.06	0.36	1.00
v/c Ratio	0.51	0.38	0.52	0.68	0.33	0.02	0.93	0.86	0.62	0.41	0.89	0.09
Control Delay	47.2	36.3	17.3	52.3	34.9	0.0	52.4	19.3	1.8	44.0	30.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.2	36.3	17.3	52.3	34.9	0.0	52.4	19.3	1.8	44.0	30.2	0.1
LOS	D	D	B	D	C	A	D	B	A	D	C	A
Approach Delay		26.7			40.4			20.5			28.9	
Approach LOS		C			D			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 80.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 24.2	Intersection LOS: C
Intersection Capacity Utilization 71.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	97	147	360	177	155	31	692	3147	974	78	2070	138
v/c Ratio	0.51	0.38	0.52	0.68	0.33	0.02	0.93	0.86	0.62	0.41	0.89	0.09
Control Delay	47.2	36.3	17.3	52.3	34.9	0.0	52.4	19.3	1.8	44.0	30.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.2	36.3	17.3	52.3	34.9	0.0	52.4	19.3	1.8	44.0	30.2	0.1
Queue Length 50th (ft)	25	36	105	31	38	0	177	386	0	20	280	0
Queue Length 95th (ft)	50	64	183	#63	67	0	#294	481	0	42	#356	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	189	787	686	259	787	1583	741	3642	1583	189	2338	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.19	0.52	0.68	0.20	0.02	0.93	0.86	0.62	0.41	0.89	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	137	335	165	144	29	644	2927	906	73	1925	128
Future Volume (veh/h)	90	137	335	165	144	29	644	2927	906	73	1925	128
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1575	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	97	147	360	177	155	0	692	3147	0	78	2070	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	157	697	656	236	715		673	3212		148	2119	
Arrive On Green	0.05	0.20	0.20	0.06	0.20	0.00	0.22	0.50	0.00	0.05	0.33	0.00
Sat Flow, veh/h	3092	3554	1585	4230	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	97	147	360	177	155	0	692	3147	0	78	2070	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1410	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	2.8	3.1	15.4	3.7	3.3	0.0	19.5	43.0	0.0	2.2	28.5	0.0
Cycle Q Clear(g_c), s	2.8	3.1	15.4	3.7	3.3	0.0	19.5	43.0	0.0	2.2	28.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	157	697	656	236	715		673	3212		148	2119	
V/C Ratio(X)	0.62	0.21	0.55	0.75	0.22		1.03	0.98		0.53	0.98	
Avail Cap(c_a), veh/h	173	714	664	236	715		673	3212		173	2119	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	41.7	30.2	19.9	41.7	29.9	0.0	35.0	22.0	0.0	41.7	29.7	0.0
Incr Delay (d2), s/veh	5.6	0.1	0.9	12.5	0.2	0.0	42.1	11.6	0.0	2.9	14.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	1.3	5.6	1.5	1.4	0.0	11.1	17.3	0.0	0.9	12.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.3	30.3	20.8	54.2	30.0	0.0	77.1	33.6	0.0	44.6	44.2	0.0
LnGrp LOS	D	C	C	D	C		F	C		D	D	
Approach Vol, veh/h		604			332	A		3839	A		2148	A
Approach Delay, s/veh		27.4			42.9			41.4			44.2	
Approach LOS		C			D			D			D	

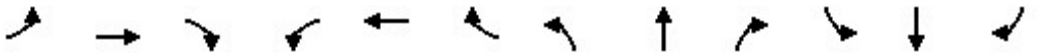
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.8	49.2	9.5	22.1	24.0	34.0	9.1	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	44.0	5.0	18.0	19.5	29.5	5.0	18.0
Max Q Clear Time (g_c+I1), s	4.2	45.0	5.7	17.4	21.5	30.5	4.8	5.3
Green Ext Time (p_c), s	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	41.1
HCM 6th LOS	D

Notes

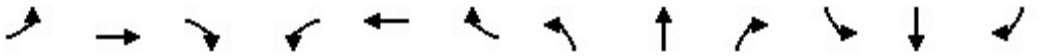
User approved changes to right turn type.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			236			236			236			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



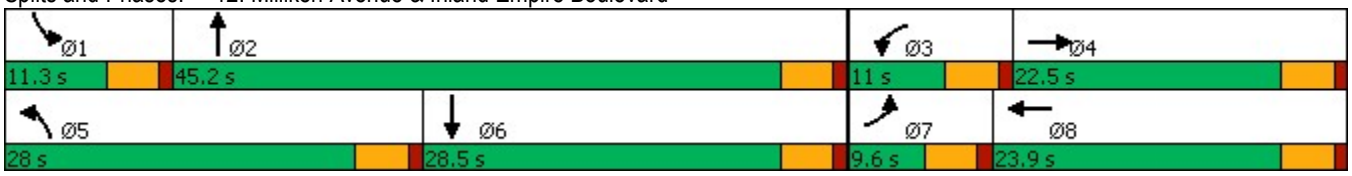
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	89	47	73	138	109	35	568	1505	154	82	1224	182
Future Volume (vph)	89	47	73	138	109	35	568	1505	154	82	1224	182
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	103	55	85	160	127	41	660	1750	179	95	1423	212
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	55	85	160	127	41	660	1750	179	95	1423	212

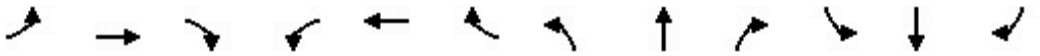
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	47	73	138	109	35	568	1505	154	82	1224	182
Future Volume (vph)	89	47	73	138	109	35	568	1505	154	82	1224	182
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.6	22.5		11.0	23.9		28.0	45.2		11.3	28.5	
Total Split (%)	10.7%	25.0%		12.2%	26.6%		31.1%	50.2%		12.6%	31.7%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	5.2	7.0	73.1	8.7	8.3	73.1	20.3	39.9	73.1	6.7	23.5	73.1
Actuated g/C Ratio	0.07	0.10	1.00	0.12	0.11	1.00	0.28	0.55	1.00	0.09	0.32	1.00
v/c Ratio	0.47	0.16	0.05	0.44	0.32	0.03	0.77	0.50	0.11	0.34	0.69	0.13
Control Delay	43.3	33.9	0.1	37.9	34.3	0.0	32.0	12.4	0.1	37.6	24.8	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.3	33.9	0.1	37.9	34.3	0.0	32.0	12.4	0.1	37.6	24.8	0.2
LOS	D	C	A	D	C	A	C	B	A	D	C	A
Approach Delay		26.0			31.7			16.6			22.5	
Approach LOS		C			C			B			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 73.1	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 20.2	Intersection LOS: C
Intersection Capacity Utilization 58.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	103	55	85	160	127	41	660	1750	179	95	1423	212
v/c Ratio	0.47	0.16	0.05	0.44	0.32	0.03	0.77	0.50	0.11	0.34	0.69	0.13
Control Delay	43.3	33.9	0.1	37.9	34.3	0.0	32.0	12.4	0.1	37.6	24.8	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.3	33.9	0.1	37.9	34.3	0.0	32.0	12.4	0.1	37.6	24.8	0.2
Queue Length 50th (ft)	25	13	0	39	30	0	148	156	0	22	174	0
Queue Length 95th (ft)	48	29	0	#73	54	0	202	186	0	44	215	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	218	891	1583	366	960	1583	1010	3649	1583	292	2152	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.06	0.05	0.44	0.13	0.03	0.65	0.48	0.11	0.33	0.66	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	47	73	138	109	35	568	1505	154	82	1224	182
Future Volume (veh/h)	89	47	73	138	109	35	568	1505	154	82	1224	182
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	103	55	0	160	127	0	660	1750	0	95	1423	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	199	268		239	313		797	3298		193	2041	
Arrive On Green	0.06	0.08	0.00	0.08	0.09	0.00	0.26	0.51	0.00	0.06	0.32	0.00
Sat Flow, veh/h	3092	3554	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	103	55	0	160	127	0	660	1750	0	95	1423	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	2.1	1.0	0.0	3.3	2.2	0.0	13.3	12.0	0.0	2.0	12.8	0.0
Cycle Q Clear(g_c), s	2.1	1.0	0.0	3.3	2.2	0.0	13.3	12.0	0.0	2.0	12.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	199	268		239	313		797	3298		193	2041	
V/C Ratio(X)	0.52	0.21		0.67	0.41		0.83	0.53		0.49	0.70	
Avail Cap(c_a), veh/h	239	968		304	1044		1100	3964		318	2338	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.9	28.7	0.0	29.7	28.5	0.0	23.1	10.8	0.0	30.0	19.8	0.0
Incr Delay (d2), s/veh	2.1	0.4	0.0	3.8	0.8	0.0	3.9	0.1	0.0	1.9	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.4	0.0	1.3	0.9	0.0	4.9	3.7	0.0	0.8	4.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.0	29.1	0.0	33.5	29.3	0.0	27.0	10.9	0.0	31.9	20.5	0.0
LnGrp LOS	C	C		C	C		C	B		C	C	
Approach Vol, veh/h		158	A		287	A		2410	A		1518	A
Approach Delay, s/veh		31.0			31.7			15.3			21.3	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	38.4	9.6	9.5	21.5	25.5	8.7	10.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.8	40.7	6.5	18.0	23.5	24.0	5.1	19.4
Max Q Clear Time (g_c+I1), s	4.0	14.0	5.3	3.0	15.3	14.8	4.1	4.2
Green Ext Time (p_c), s	0.1	15.8	0.1	0.2	1.7	6.1	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	19.0
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1800	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.943	0.850				
Flt Protected	0.970					
Satd. Flow (prot)	3132	1441	6408	0	0	6408
Flt Permitted	0.970					
Satd. Flow (perm)	3132	1441	6408	0	0	6408
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

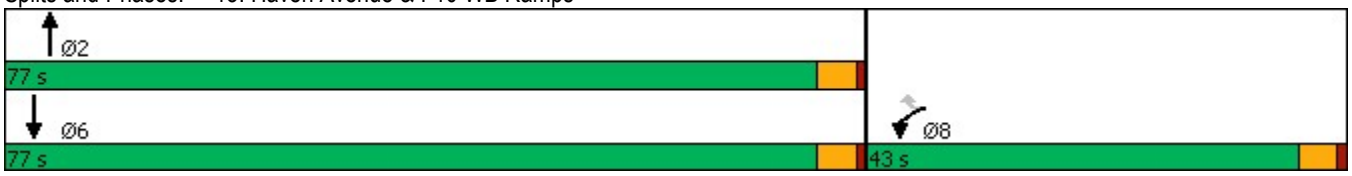
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	695	951	3661	0	0	2153
Future Volume (vph)	695	951	3661	0	0	2153
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	764	1045	4023	0	0	2366
Shared Lane Traffic (%)		45%				
Lane Group Flow (vph)	1234	575	4023	0	0	2366

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	695	951	3661	2153
Future Volume (vph)	695	951	3661	2153
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	43.0	43.0	77.0	77.0
Total Split (%)	35.8%	35.8%	64.2%	64.2%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	38.5	38.5	72.5	72.5
Actuated g/C Ratio	0.32	0.32	0.60	0.60
v/c Ratio	1.23	1.24	1.04	0.61
Control Delay	148.0	163.0	50.3	15.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	148.0	163.0	50.3	15.8
LOS	F	F	D	B
Approach Delay	152.8		50.3	15.8
Approach LOS	F		D	B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.24	
Intersection Signal Delay: 62.9	Intersection LOS: E
Intersection Capacity Utilization 103.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps



Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1234	575	4023	2366
v/c Ratio	1.23	1.24	1.04	0.61
Control Delay	148.0	163.0	50.3	15.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	148.0	163.0	50.3	15.8
Queue Length 50th (ft)	~607	~608	~977	314
Queue Length 95th (ft)	#742	#851	#1030	348
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	1004	462	3871	3871
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.23	1.24	1.04	0.61

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

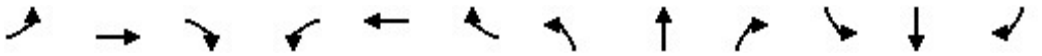
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	695	951	3661	0	0	2153
Future Volume (veh/h)	695	951	3661	0	0	2153
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1772	1870	1870	0	0	1870
Adj Flow Rate, veh/h	603	1217	4023	0	0	2366
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	541	1017	3887	0	0	3887
Arrive On Green	0.32	0.32	0.60	0.00	0.00	0.60
Sat Flow, veh/h	1688	3170	6958	0	0	6958
Grp Volume(v), veh/h	603	1217	4023	0	0	2366
Grp Sat Flow(s),veh/h/ln	1688	1585	1609	0	0	1609
Q Serve(g_s), s	38.5	38.5	72.5	0.0	0.0	27.6
Cycle Q Clear(g_c), s	38.5	38.5	72.5	0.0	0.0	27.6
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	541	1017	3887	0	0	3887
V/C Ratio(X)	1.11	1.20	1.03	0.00	0.00	0.61
Avail Cap(c_a), veh/h	541	1017	3887	0	0	3887
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	40.8	40.8	23.8	0.0	0.0	14.9
Incr Delay (d2), s/veh	73.8	98.2	24.5	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	26.8	28.6	31.9	0.0	0.0	9.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	114.5	138.9	48.3	0.0	0.0	15.1
LnGrp LOS	F	F	F	A	A	B
Approach Vol, veh/h	1820		4023			2366
Approach Delay, s/veh	130.8		48.3			15.1
Approach LOS	F		D			B

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	77.0			77.0	43.0
Change Period (Y+Rc), s	4.5			4.5	4.5
Max Green Setting (Gmax), s	72.5			72.5	38.5
Max Q Clear Time (g_c+I1), s	74.5			29.6	40.5
Green Ext Time (p_c), s	0.0			30.9	0.0

Intersection Summary	
HCM 6th Ctrl Delay	57.0
HCM 6th LOS	E

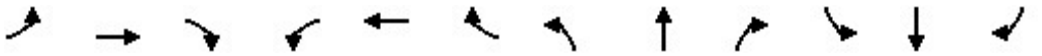
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	1863	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	1863	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			220			182			473			130
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



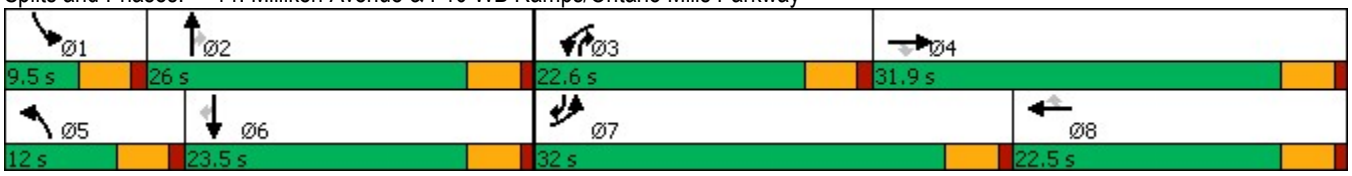
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	852	125	332	227	259	48	216	1256	421	117	835	354
Future Volume (vph)	852	125	332	227	259	48	216	1256	421	117	835	354
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	957	140	373	255	291	54	243	1411	473	131	938	398
Shared Lane Traffic (%)												
Lane Group Flow (vph)	957	140	373	255	291	54	243	1411	473	131	938	398

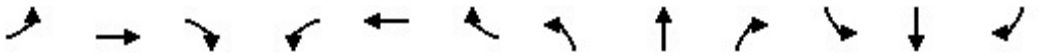
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	852	125	332	227	259	48	216	1256	421	117	835	354
Future Volume (vph)	852	125	332	227	259	48	216	1256	421	117	835	354
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	32.0	31.9	31.9	22.6	22.5	22.5	12.0	26.0	22.6	9.5	23.5	32.0
Total Split (%)	35.6%	35.4%	35.4%	25.1%	25.0%	25.0%	13.3%	28.9%	25.1%	10.6%	26.1%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	27.5	27.0	27.0	12.9	12.4	12.4	7.5	21.5	39.0	5.0	19.0	51.1
Actuated g/C Ratio	0.33	0.32	0.32	0.15	0.15	0.15	0.09	0.25	0.46	0.06	0.22	0.60
v/c Ratio	0.96	0.24	0.57	0.54	0.56	0.14	0.89	0.86	0.48	0.72	0.65	0.39
Control Delay	49.4	23.4	13.9	37.3	37.7	0.8	73.3	37.3	3.1	63.2	32.5	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.4	23.4	13.9	37.3	37.7	0.8	73.3	37.3	3.1	63.2	32.5	7.3
LOS	D	C	B	D	D	A	E	D	A	E	C	A
Approach Delay		37.9			34.2			33.8			28.4	
Approach LOS		D			C			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 84.5	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 33.5	Intersection LOS: C
Intersection Capacity Utilization 71.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway

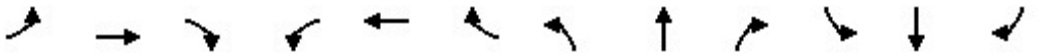




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	957	140	373	255	291	54	243	1411	473	131	938	398
v/c Ratio	0.96	0.24	0.57	0.54	0.56	0.14	0.89	0.86	0.48	0.72	0.65	0.39
Control Delay	49.4	23.4	13.9	37.3	37.7	0.8	73.3	37.3	3.1	63.2	32.5	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.4	23.4	13.9	37.3	37.7	0.8	73.3	37.3	3.1	63.2	32.5	7.3
Queue Length 50th (ft)	252	54	61	64	76	0	66	206	0	36	131	61
Queue Length 95th (ft)	#405	106	156	100	114	0	#141	#286	45	#83	175	130
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	1001	606	664	659	755	480	273	1633	1053	182	1443	1008
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.23	0.56	0.39	0.39	0.11	0.89	0.86	0.45	0.72	0.65	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	852	125	332	227	259	48	216	1256	421	117	835	354
Future Volume (veh/h)	852	125	332	227	259	48	216	1256	421	117	835	354
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	957	140	373	255	291	54	243	1411	473	131	938	398
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1024	636	539	345	427	190	286	1706	597	191	1507	896
Arrive On Green	0.33	0.34	0.34	0.11	0.12	0.12	0.09	0.27	0.27	0.06	0.23	0.23
Sat Flow, veh/h	3092	1870	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	957	140	373	255	291	54	243	1411	473	131	938	398
Grp Sat Flow(s),veh/h/ln	1546	1870	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	24.3	4.3	16.5	6.5	6.4	2.5	6.3	16.7	21.5	3.4	10.6	11.8
Cycle Q Clear(g_c), s	24.3	4.3	16.5	6.5	6.4	2.5	6.3	16.7	21.5	3.4	10.6	11.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1024	636	539	345	427	190	286	1706	597	191	1507	896
V/C Ratio(X)	0.93	0.22	0.69	0.74	0.68	0.28	0.85	0.83	0.79	0.69	0.62	0.44
Avail Cap(c_a), veh/h	1048	636	539	690	789	352	286	1706	597	191	1507	896
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.3	19.1	23.1	34.9	34.2	32.5	36.2	28.1	22.5	37.3	27.8	10.2
Incr Delay (d2), s/veh	14.5	0.2	3.8	3.1	1.9	0.8	20.8	3.5	7.2	9.9	0.8	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.5	1.8	6.4	2.5	2.8	1.0	3.1	6.6	8.7	1.5	4.0	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.7	19.3	26.9	38.0	36.1	33.3	57.1	31.6	29.7	47.2	28.6	10.6
LnGrp LOS	D	B	C	D	D	C	E	C	C	D	C	B
Approach Vol, veh/h		1470			600			2127			1467	
Approach Delay, s/veh		35.2			36.7			34.1			25.4	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	26.0	13.5	32.1	12.0	23.5	31.4	14.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	21.5	18.1	27.4	7.5	19.0	27.5	18.0
Max Q Clear Time (g_c+I1), s	5.4	23.5	8.5	18.5	8.3	13.8	26.3	8.4
Green Ext Time (p_c), s	0.0	0.0	0.6	1.5	0.0	3.3	0.6	1.4

Intersection Summary	
HCM 6th Ctrl Delay	32.4
HCM 6th LOS	C

Notes

User approved changes to right turn type.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.993	0.850				
Flt Protected	0.954					
Satd. Flow (prot)	3243	1441	0	6408	6408	0
Flt Permitted	0.954					
Satd. Flow (perm)	3243	1441	0	6408	6408	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

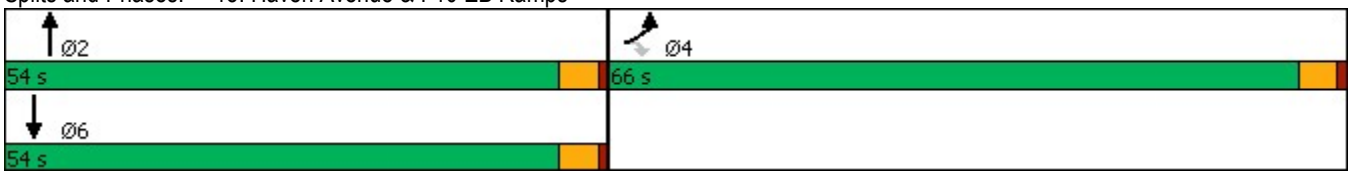
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	1749	816	0	2373	2137	0
Future Volume (vph)	1749	816	0	2373	2137	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1965	917	0	2666	2401	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	2057	825	0	2666	2401	0

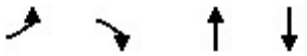
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1749	816	2373	2137
Future Volume (vph)	1749	816	2373	2137
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	66.0	66.0	54.0	54.0
Total Split (%)	55.0%	55.0%	45.0%	45.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	61.5	61.5	49.5	49.5
Actuated g/C Ratio	0.51	0.51	0.41	0.41
v/c Ratio	1.24	1.12	1.01	0.91
Control Delay	140.7	99.7	54.9	39.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	140.7	99.7	54.9	39.3
LOS	F	F	D	D
Approach Delay	129.0		54.9	39.3
Approach LOS	F		D	D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.24	
Intersection Signal Delay: 77.1	Intersection LOS: E
Intersection Capacity Utilization 103.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	2057	825	2666	2401
v/c Ratio	1.24	1.12	1.01	0.91
Control Delay	140.7	99.7	54.9	39.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	140.7	99.7	54.9	39.3
Queue Length 50th (ft)	~1018	~807	~603	500
Queue Length 95th (ft)	#1133	#1054	#686	543
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	1662	738	2643	2643
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.24	1.12	1.01	0.91

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1749	816	0	2373	2137	0
Future Volume (veh/h)	1749	816	0	2373	2137	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1772	1870	0	1870	1870	0
Adj Flow Rate, veh/h	1965	917	0	2666	2401	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	1730	812	0	2654	2654	0
Arrive On Green	0.51	0.51	0.00	0.41	0.41	0.00
Sat Flow, veh/h	3375	1585	0	6958	6958	0
Grp Volume(v), veh/h	1965	917	0	2666	2401	0
Grp Sat Flow(s),veh/h/ln	1688	1585	0	1609	1609	0
Q Serve(g_s), s	61.5	61.5	0.0	49.5	42.0	0.0
Cycle Q Clear(g_c), s	61.5	61.5	0.0	49.5	42.0	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	1730	812	0	2654	2654	0
V/C Ratio(X)	1.14	1.13	0.00	1.00	0.90	0.00
Avail Cap(c_a), veh/h	1730	812	0	2654	2654	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.3	29.3	0.0	35.3	33.0	0.0
Incr Delay (d2), s/veh	68.9	73.3	0.0	18.6	4.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	40.2	38.8	0.0	22.3	16.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	98.2	102.6	0.0	53.8	37.9	0.0
LnGrp LOS	F	F	A	F	D	A
Approach Vol, veh/h	2882			2666	2401	
Approach Delay, s/veh	99.6			53.8	37.9	
Approach LOS	F			D	D	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		54.0		66.0		54.0
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		49.5		61.5		49.5
Max Q Clear Time (g_c+I1), s		51.5		63.5		44.0
Green Ext Time (p_c), s		0.0		0.0		5.2

Intersection Summary		
HCM 6th Ctrl Delay	65.6	
HCM 6th LOS	E	

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1700	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3072	1583	3072	6408	6408	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3072	1583	3072	6408	6408	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		1				288
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	916	822	223	983	1028	443
Future Volume (vph)	916	822	223	983	1028	443
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1053	945	256	1130	1182	509
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1053	945	256	1130	1182	509

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	916	822	223	983	1028	443
Future Volume (vph)	916	822	223	983	1028	443
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	38.0	27.0	27.0	52.0	25.0	38.0
Total Split (%)	42.2%	30.0%	30.0%	57.8%	27.8%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	32.3	56.9	20.1	45.0	20.3	57.1
Actuated g/C Ratio	0.37	0.66	0.23	0.52	0.24	0.66
v/c Ratio	0.92	0.91	0.36	0.34	0.78	0.44
Control Delay	40.0	26.5	29.4	12.4	35.9	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.0	26.5	29.4	12.4	35.9	4.3
LOS	D	C	C	B	D	A
Approach Delay	33.6			15.5	26.4	
Approach LOS	C			B	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 86.3	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 26.3	Intersection LOS: C
Intersection Capacity Utilization 73.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	1053	945	256	1130	1182	509
v/c Ratio	0.92	0.91	0.36	0.34	0.78	0.44
Control Delay	40.0	26.5	29.4	12.4	35.9	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.0	26.5	29.4	12.4	35.9	4.3
Queue Length 50th (ft)	289	383	61	100	186	46
Queue Length 95th (ft)	#393	#681	91	118	217	87
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	1199	1090	805	3547	1530	1166
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.87	0.32	0.32	0.77	0.44

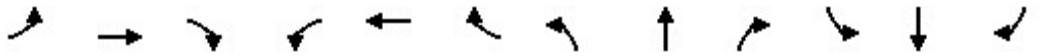
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	916	822	223	983	1028	443
Future Volume (veh/h)	916	822	223	983	1028	443
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1870	1673	1870	1870	1870
Adj Flow Rate, veh/h	1053	945	256	1130	1182	509
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1389	896	358	2767	1633	1114
Arrive On Green	0.45	0.45	0.12	0.43	0.25	0.25
Sat Flow, veh/h	3092	1585	3092	6696	6696	1585
Grp Volume(v), veh/h	1053	945	256	1130	1182	509
Grp Sat Flow(s),veh/h/ln	1546	1585	1546	1609	1609	1585
Q Serve(g_s), s	21.2	33.5	6.0	9.1	12.5	10.5
Cycle Q Clear(g_c), s	21.2	33.5	6.0	9.1	12.5	10.5
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1389	896	358	2767	1633	1114
V/C Ratio(X)	0.76	1.05	0.71	0.41	0.72	0.46
Avail Cap(c_a), veh/h	1389	896	933	4098	1769	1148
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.2	16.2	31.8	14.7	25.4	4.8
Incr Delay (d2), s/veh	2.5	45.6	2.7	0.1	1.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	38.0	2.3	3.1	4.7	9.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.6	61.8	34.4	14.8	26.8	5.1
LnGrp LOS	B	F	C	B	C	A
Approach Vol, veh/h	1998			1386	1691	
Approach Delay, s/veh	39.6			18.4	20.3	
Approach LOS	D			B	C	

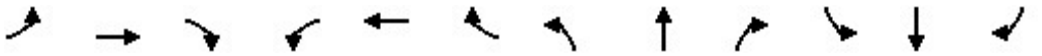
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		36.6		38.0	13.1	23.4
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		47.5		33.5	22.5	20.5
Max Q Clear Time (g_c+I1), s		11.1		35.5	8.0	14.5
Green Ext Time (p_c), s		10.3		0.0	0.7	4.4

Intersection Summary	
HCM 6th Ctrl Delay	27.4
HCM 6th LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.964				0.850			0.850		0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	4902	0	3072	3539	1583	3072	5085	1583	3072	6216	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	4902	0	3072	3539	1583	3072	5085	1583	3072	6216	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		64				136			177		65	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	510	976	303	237	835	168	353	2139	278	234	2057	519
Future Volume (vph)	510	976	303	237	835	168	353	2139	278	234	2057	519
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	554	1061	329	258	908	183	384	2325	302	254	2236	564
Shared Lane Traffic (%)												
Lane Group Flow (vph)	554	1390	0	258	908	183	384	2325	302	254	2800	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	510	976	237	835	168	353	2139	278	234	2057
Future Volume (vph)	510	976	237	835	168	353	2139	278	234	2057
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	22.0	37.0	14.0	29.0	29.0	14.0	57.0		12.0	55.0
Total Split (%)	18.3%	30.8%	11.7%	24.2%	24.2%	11.7%	47.5%		10.0%	45.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	17.5	32.5	9.5	24.5	24.5	9.5	52.5	120.0	7.5	50.5
Actuated g/C Ratio	0.15	0.27	0.08	0.20	0.20	0.08	0.44	1.00	0.06	0.42
v/c Ratio	1.24	1.01	1.06	1.26	0.42	1.58	1.05	0.19	1.32	1.06
Control Delay	167.3	68.7	127.4	167.0	15.7	316.0	65.7	0.3	220.1	67.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	167.3	68.7	127.4	167.0	15.7	316.0	65.7	0.3	220.1	67.8
LOS	F	E	F	F	B	F	E	A	F	E
Approach Delay		96.8		138.9			91.0			80.4
Approach LOS		F		F			F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.58	
Intersection Signal Delay: 95.7	Intersection LOS: F
Intersection Capacity Utilization 104.1%	ICU Level of Service G
Analysis Period (min) 15	

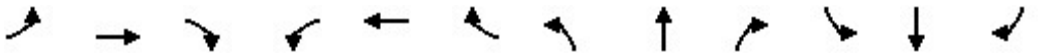
Splits and Phases: 1: Haven Avenue & 4th Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	554	1390	258	908	183	384	2325	302	254	2800
v/c Ratio	1.24	1.01	1.06	1.26	0.42	1.58	1.05	0.19	1.32	1.06
Control Delay	167.3	68.7	127.4	167.0	15.7	316.0	65.7	0.3	220.1	67.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	167.3	68.7	127.4	167.0	15.7	316.0	65.7	0.3	220.1	67.8
Queue Length 50th (ft)	~274	~389	~113	~463	30	~218	~716	0	~131	~682
Queue Length 95th (ft)	#386	#498	#200	#593	98	#318	#809	0	#217	#753
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	448	1374	243	722	431	243	2224	1583	192	2653
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.24	1.01	1.06	1.26	0.42	1.58	1.05	0.19	1.32	1.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



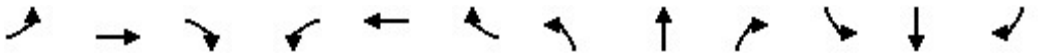
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	510	976	303	237	835	168	353	2139	278	234	2057	519
Future Volume (veh/h)	510	976	303	237	835	168	353	2139	278	234	2057	519
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	554	1061	329	258	908	183	384	2325	0	254	2236	564
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	451	1046	324	245	726	324	245	2234		193	2183	538
Arrive On Green	0.15	0.27	0.27	0.08	0.20	0.20	0.08	0.44	0.00	0.06	0.42	0.42
Sat Flow, veh/h	3092	3862	1197	3092	3554	1585	3092	5106	1585	3092	5186	1279
Grp Volume(v), veh/h	554	935	455	258	908	183	384	2325	0	254	2077	723
Grp Sat Flow(s),veh/h/ln	1546	1702	1655	1546	1777	1585	1546	1702	1585	1546	1609	1640
Q Serve(g_s), s	17.5	32.5	32.5	9.5	24.5	12.5	9.5	52.5	0.0	7.5	50.5	50.5
Cycle Q Clear(g_c), s	17.5	32.5	32.5	9.5	24.5	12.5	9.5	52.5	0.0	7.5	50.5	50.5
Prop In Lane	1.00		0.72	1.00		1.00	1.00		1.00	1.00		0.78
Lane Grp Cap(c), veh/h	451	922	448	245	726	324	245	2234		193	2031	690
V/C Ratio(X)	1.23	1.01	1.01	1.05	1.25	0.57	1.57	1.04		1.31	1.02	1.05
Avail Cap(c_a), veh/h	451	922	448	245	726	324	245	2234		193	2031	690
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.2	43.8	43.8	55.3	47.8	43.0	55.3	33.8	0.0	56.3	34.8	34.8
Incr Delay (d2), s/veh	121.1	33.3	46.3	72.4	124.4	2.3	274.8	30.7	0.0	173.3	26.0	47.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.3	17.8	18.9	6.2	23.3	5.1	13.0	27.3	0.0	7.6	24.1	28.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	172.4	77.0	90.0	127.7	172.1	45.2	330.1	64.4	0.0	229.5	60.7	82.1
LnGrp LOS	F	F	F	F	F	D	F	F		F	F	F
Approach Vol, veh/h		1944			1349			2709	A		3054	
Approach Delay, s/veh		107.2			146.4			102.1			79.8	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	57.0	14.0	37.0	14.0	55.0	22.0	29.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	52.5	9.5	32.5	9.5	50.5	17.5	24.5
Max Q Clear Time (g_c+I1), s	9.5	54.5	11.5	34.5	11.5	52.5	19.5	26.5
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	102.3
HCM 6th LOS	F

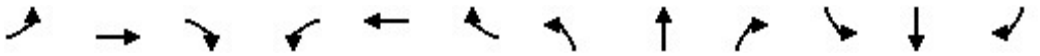
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.996				0.850			0.850		0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	6382	0	1676	5085	1583	1676	1863	1583	1676	3008	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1676	6382	0	1676	5085	1583	1676	1863	1583	1676	3008	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				160			132		162	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	6	2522	67	1	1546	193	69	0	13	151	0	17
Future Volume (vph)	6	2522	67	1	1546	193	69	0	13	151	0	17
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	6	2655	71	1	1627	203	73	0	14	159	0	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	6	2726	0	1	1627	203	73	0	14	159	18	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	6	2522	1	1546	193	69	13	151	0
Future Volume (vph)	6	2522	1	1546	193	69	13	151	0
Turn Type	Prot	NA	Prot	NA	Perm	Prot	Perm	Prot	NA
Protected Phases	7	4	3	8		5		1	6
Permitted Phases					8		2		
Detector Phase	7	4	3	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.5	42.4	9.5	42.4	42.4	11.8	23.7	14.4	26.3
Total Split (%)	10.6%	47.1%	10.6%	47.1%	47.1%	13.1%	26.3%	16.0%	29.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.0	38.0	5.0	38.0	38.0	7.0	5.5	9.8	10.5
Actuated g/C Ratio	0.07	0.55	0.07	0.55	0.55	0.10	0.08	0.14	0.15
v/c Ratio	0.05	0.77	0.01	0.58	0.21	0.43	0.06	0.66	0.03
Control Delay	32.5	14.3	32.0	11.5	3.3	38.1	0.5	44.3	0.1
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Total Delay	32.5	14.3	32.0	11.7	3.3	38.1	0.5	44.3	0.1
LOS	C	B	C	B	A	D	A	D	A
Approach Delay		14.3		10.8					39.8
Approach LOS		B		B					D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 68.6	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 61.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	6	2726	1	1627	203	73	14	159	18
v/c Ratio	0.05	0.77	0.01	0.58	0.21	0.43	0.06	0.66	0.03
Control Delay	32.5	14.3	32.0	11.5	3.3	38.1	0.5	44.3	0.1
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Total Delay	32.5	14.3	32.0	11.7	3.3	38.1	0.5	44.3	0.1
Queue Length 50th (ft)	2	219	0	139	7	28	0	62	0
Queue Length 95th (ft)	14	365	5	245	42	74	0	#163	0
Internal Link Dist (ft)		2546		362					358
Turn Bay Length (ft)	130		130		145	165	165	50	
Base Capacity (vph)	122	3537	122	2816	948	179	539	242	1068
Starvation Cap Reductn	0	0	0	394	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.77	0.01	0.67	0.21	0.41	0.03	0.66	0.02

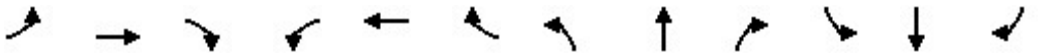
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	2522	67	1	1546	193	69	0	13	151	0	17
Future Volume (veh/h)	6	2522	67	1	1546	193	69	0	13	151	0	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1870	1870	1772	1870	1870	1772	1870	1870	1772	1870	1870
Adj Flow Rate, veh/h	6	2655	71	1	1627	203	73	0	14	159	0	18
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	13	3514	94	3	2731	848	93	139	117	196	240	214
Arrive On Green	0.01	0.54	0.54	0.00	0.53	0.53	0.06	0.00	0.07	0.12	0.00	0.14
Sat Flow, veh/h	1688	6491	173	1688	5106	1585	1688	1870	1585	1688	1777	1585
Grp Volume(v), veh/h	6	1972	754	1	1627	203	73	0	14	159	0	18
Grp Sat Flow(s),veh/h/ln	1688	1609	1839	1688	1702	1585	1688	1870	1585	1688	1777	1585
Q Serve(g_s), s	0.2	21.4	21.5	0.0	14.7	4.6	2.9	0.0	0.6	6.2	0.0	0.7
Cycle Q Clear(g_c), s	0.2	21.4	21.5	0.0	14.7	4.6	2.9	0.0	0.6	6.2	0.0	0.7
Prop In Lane	1.00		0.09	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	13	2612	996	3	2731	848	93	139	117	196	240	214
V/C Ratio(X)	0.45	0.75	0.76	0.40	0.60	0.24	0.78	0.00	0.12	0.81	0.00	0.08
Avail Cap(c_a), veh/h	125	2711	1033	125	2869	890	183	532	451	248	574	512
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.3	12.0	12.0	33.7	10.7	8.4	31.5	0.0	29.2	29.1	0.0	25.5
Incr Delay (d2), s/veh	22.1	1.2	3.2	79.9	0.3	0.1	13.3	0.0	0.4	14.6	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	6.6	8.2	0.1	4.7	1.4	1.5	0.0	0.2	3.2	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.4	13.2	15.2	113.6	11.0	8.5	44.7	0.0	29.6	43.7	0.0	25.7
LnGrp LOS	E	B	B	F	B	A	D	A	C	D	A	C
Approach Vol, veh/h		2732			1831			87			177	
Approach Delay, s/veh		13.8			10.8			42.3			41.9	
Approach LOS		B			B			D			D	

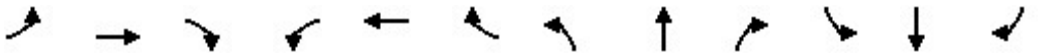
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.3	9.5	4.6	41.0	8.2	13.6	5.0	40.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.9	19.2	5.0	37.9	7.3	21.8	5.0	37.9
Max Q Clear Time (g_c+I1), s	8.2	2.6	2.0	23.5	4.9	2.7	2.2	16.7
Green Ext Time (p_c), s	0.1	0.0	0.0	13.0	0.0	0.0	0.0	13.4

Intersection Summary	
HCM 6th Ctrl Delay	14.2
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1800	1900	1900	1800	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.995				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.953	
Satd. Flow (prot)	3072	6401	0	1676	5060	0	1676	1863	1583	0	1775	1583
Flt Permitted	0.950			0.950			0.715				0.730	
Satd. Flow (perm)	3072	6401	0	1676	5060	0	1262	1863	1583	0	1360	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			10				152			94
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



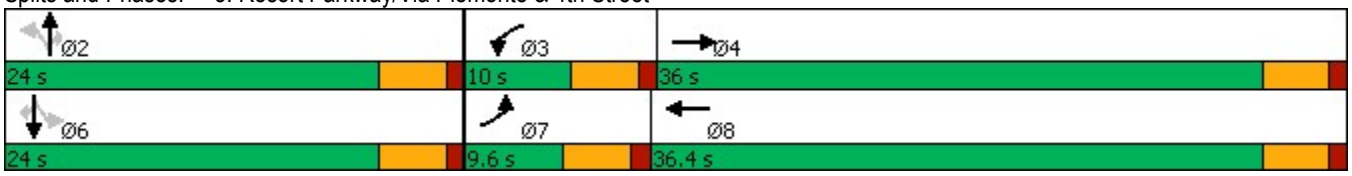
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	41	2545	12	67	1521	54	41	0	53	60	1	28
Future Volume (vph)	41	2545	12	67	1521	54	41	0	53	60	1	28
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	43	2679	13	71	1601	57	43	0	56	63	1	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	2692	0	71	1658	0	43	0	56	0	64	29

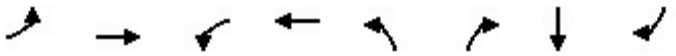
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	41	2545	67	1521	41	53	60	1	28
Future Volume (vph)	41	2545	67	1521	41	53	60	1	28
Turn Type	Prot	NA	Prot	NA	Perm	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8				6	
Permitted Phases					2	2	6		6
Detector Phase	7	4	3	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.6	36.0	10.0	36.4	24.0	24.0	24.0	24.0	24.0
Total Split (%)	13.7%	51.4%	14.3%	52.0%	34.3%	34.3%	34.3%	34.3%	34.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min
Act Effct Green (s)	5.2	32.0	5.6	34.0	8.0	8.0		8.0	8.0
Actuated g/C Ratio	0.10	0.59	0.10	0.62	0.15	0.15		0.15	0.15
v/c Ratio	0.15	0.72	0.42	0.53	0.23	0.16		0.32	0.09
Control Delay	26.7	10.8	33.8	7.7	25.3	0.9		26.8	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	26.7	10.8	33.8	7.7	25.3	0.9		26.8	0.6
LOS	C	B	C	A	C	A		C	A
Approach Delay		11.1		8.7				18.6	
Approach LOS		B		A				B	

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 54.6	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 10.4	Intersection LOS: B
Intersection Capacity Utilization 62.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street





Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBT	SBR
Lane Group Flow (vph)	43	2692	71	1658	43	56	64	29
v/c Ratio	0.15	0.72	0.42	0.53	0.23	0.16	0.32	0.09
Control Delay	26.7	10.8	33.8	7.7	25.3	0.9	26.8	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.7	10.8	33.8	7.7	25.3	0.9	26.8	0.6
Queue Length 50th (ft)	7	196	24	67	14	0	21	0
Queue Length 95th (ft)	21	277	#67	190	38	0	52	0
Internal Link Dist (ft)		362		428			378	
Turn Bay Length (ft)	220		125		115	115		110
Base Capacity (vph)	291	3752	171	3173	457	671	493	634
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.72	0.42	0.52	0.09	0.08	0.13	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	2545	12	67	1521	54	41	0	53	60	1	28
Future Volume (veh/h)	41	2545	12	67	1521	54	41	0	53	60	1	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1772	1870	1870	1772	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	43	2679	13	71	1601	57	43	0	56	63	1	29
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	137	3780	18	103	2959	105	231	218	185	289	4	185
Arrive On Green	0.04	0.57	0.57	0.06	0.58	0.58	0.12	0.00	0.12	0.12	0.12	0.12
Sat Flow, veh/h	3092	6658	32	1688	5062	180	1307	1870	1585	1325	31	1585
Grp Volume(v), veh/h	43	1941	751	71	1077	581	43	0	56	64	0	29
Grp Sat Flow(s),veh/h/ln	1546	1609	1865	1688	1702	1838	1307	1870	1585	1356	0	1585
Q Serve(g_s), s	0.7	15.4	15.4	2.2	10.2	10.2	1.7	0.0	1.7	2.3	0.0	0.9
Cycle Q Clear(g_c), s	0.7	15.4	15.4	2.2	10.2	10.2	4.0	0.0	1.7	2.3	0.0	0.9
Prop In Lane	1.00		0.02	1.00		0.10	1.00		1.00	0.98		1.00
Lane Grp Cap(c), veh/h	137	2740	1059	103	1990	1075	231	218	185	293	0	185
V/C Ratio(X)	0.31	0.71	0.71	0.69	0.54	0.54	0.19	0.00	0.30	0.22	0.00	0.16
Avail Cap(c_a), veh/h	297	2867	1108	175	2048	1106	559	688	583	633	0	583
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.6	8.3	8.3	24.4	6.7	6.7	23.6	0.0	21.5	21.7	0.0	21.1
Incr Delay (d2), s/veh	1.3	0.8	2.0	7.9	0.3	0.5	0.4	0.0	0.9	0.4	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	4.0	5.0	1.0	2.6	2.9	0.5	0.0	0.6	0.7	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.9	9.1	10.3	32.3	7.0	7.2	23.9	0.0	22.4	22.1	0.0	21.5
LnGrp LOS	C	A	B	C	A	A	C	A	C	C	A	C
Approach Vol, veh/h		2735			1729			99			93	
Approach Delay, s/veh		9.7			8.1			23.1			21.9	
Approach LOS		A			A			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		10.7	7.7	34.6		10.7	6.8	35.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		19.5	5.5	31.5		19.5	5.1	31.9				
Max Q Clear Time (g_c+I1), s		6.0	4.2	17.4		4.3	2.7	12.2				
Green Ext Time (p_c), s		0.2	0.0	12.7		0.3	0.0	11.8				

Intersection Summary	
HCM 6th Ctrl Delay	9.6
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.995					0.865
Flt Protected						
Satd. Flow (prot)	5060	0	0	5085	0	1611
Flt Permitted						
Satd. Flow (perm)	5060	0	0	5085	0	1611
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	2580	89	0	1604	0	63
Future Volume (vph)	2580	89	0	1604	0	63
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	2688	93	0	1671	0	66
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2781	0	0	1671	0	66

Intersection Summary

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2580	89	0	1604	0	63
Future Vol, veh/h	2580	89	0	1604	0	63
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2688	93	0	1671	0	66

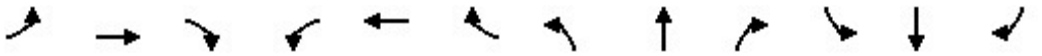
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1391
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	113
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	113
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	73.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	113	-	-	-
HCM Lane V/C Ratio	0.581	-	-	-
HCM Control Delay (s)	73.8	-	-	-
HCM Lane LOS	F	-	-	-
HCM 95th %tile Q(veh)	2.8	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.980	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	5085	1583	3072	5085	1583	3072	6408	1583	3072	6280	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	5085	1583	3072	5085	1583	3072	6408	1583	3072	6280	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			181			280			55		31	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



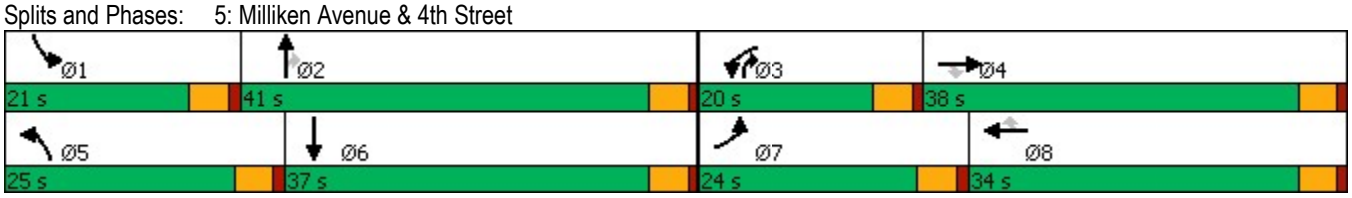
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	610	1550	288	531	1244	385	426	2108	523	605	1318	201
Future Volume (vph)	610	1550	288	531	1244	385	426	2108	523	605	1318	201
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	635	1615	300	553	1296	401	444	2196	545	630	1373	209
Shared Lane Traffic (%)												
Lane Group Flow (vph)	635	1615	300	553	1296	401	444	2196	545	630	1582	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	610	1550	288	531	1244	385	426	2108	523	605	1318
Future Volume (vph)	610	1550	288	531	1244	385	426	2108	523	605	1318
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	24.0	38.0	38.0	20.0	34.0	34.0	25.0	41.0	20.0	21.0	37.0
Total Split (%)	20.0%	31.7%	31.7%	16.7%	28.3%	28.3%	20.8%	34.2%	16.7%	17.5%	30.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	19.5	33.5	33.5	15.5	29.5	29.5	19.9	36.5	56.5	16.5	33.1
Actuated g/C Ratio	0.16	0.28	0.28	0.13	0.25	0.25	0.17	0.30	0.47	0.14	0.28
v/c Ratio	1.27	1.14	0.52	1.40	1.04	0.67	0.87	1.13	0.70	1.49	0.90
Control Delay	178.8	111.0	17.7	232.2	79.7	18.3	67.5	103.2	28.4	270.5	49.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	178.8	111.0	17.7	232.2	79.7	18.3	67.5	103.2	28.4	270.5	49.3
LOS	F	F	B	F	E	B	E	F	C	F	D
Approach Delay		116.9			106.2			85.4			112.3
Approach LOS		F			F			F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.49	
Intersection Signal Delay: 103.7	Intersection LOS: F
Intersection Capacity Utilization 111.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 5: Milliken Avenue & 4th Street

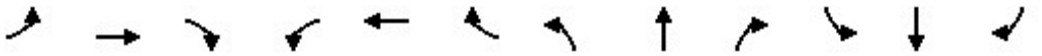


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	635	1615	300	553	1296	401	444	2196	545	630	1582
v/c Ratio	1.27	1.14	0.52	1.40	1.04	0.67	0.87	1.13	0.70	1.49	0.90
Control Delay	178.8	111.0	17.7	232.2	79.7	18.3	67.5	103.2	28.4	270.5	49.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	178.8	111.0	17.7	232.2	79.7	18.3	67.5	103.2	28.4	270.5	49.3
Queue Length 50th (ft)	~320	~534	73	~294	~395	80	173	~572	295	~347	340
Queue Length 95th (ft)	#437	#631	162	#407	#491	196	#256	#647	434	#464	#398
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	499	1419	572	396	1250	600	524	1949	774	422	1755
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.27	1.14	0.52	1.40	1.04	0.67	0.85	1.13	0.70	1.49	0.90

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

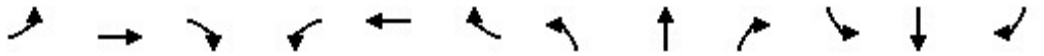
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	610	1550	288	531	1244	385	426	2108	523	605	1318	201
Future Volume (veh/h)	610	1550	288	531	1244	385	426	2108	523	605	1318	201
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	635	1615	300	553	1296	401	444	2196	545	630	1373	209
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	502	1425	442	399	1255	390	495	1957	687	425	1599	243
Arrive On Green	0.16	0.28	0.28	0.13	0.25	0.25	0.16	0.30	0.30	0.14	0.28	0.28
Sat Flow, veh/h	3092	5106	1585	3092	5106	1585	3092	6434	1585	3092	5678	862
Grp Volume(v), veh/h	635	1615	300	553	1296	401	444	2196	545	630	1166	416
Grp Sat Flow(s),veh/h/ln	1546	1702	1585	1546	1702	1585	1546	1609	1585	1546	1609	1715
Q Serve(g_s), s	19.5	33.5	20.2	15.5	29.5	29.5	16.9	36.5	35.6	16.5	27.5	27.6
Cycle Q Clear(g_c), s	19.5	33.5	20.2	15.5	29.5	29.5	16.9	36.5	35.6	16.5	27.5	27.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	502	1425	442	399	1255	390	495	1957	687	425	1359	483
V/C Ratio(X)	1.26	1.13	0.68	1.38	1.03	1.03	0.90	1.12	0.79	1.48	0.86	0.86
Avail Cap(c_a), veh/h	502	1425	442	399	1255	390	528	1957	687	425	1359	483
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.3	43.3	38.5	52.3	45.3	45.2	49.4	41.8	29.4	51.8	40.8	40.9
Incr Delay (d2), s/veh	133.9	69.1	4.1	188.0	34.1	53.3	17.3	62.4	6.4	229.2	5.7	14.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.8	23.1	8.3	16.4	16.3	17.3	7.7	22.7	14.5	19.9	11.5	13.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	184.2	112.4	42.6	240.3	79.4	98.5	66.8	104.1	35.7	280.9	46.6	55.5
LnGrp LOS	F	F	D	F	F	F	E	F	D	F	D	E
Approach Vol, veh/h		2550			2250			3185			2212	
Approach Delay, s/veh		122.1			122.3			87.2			115.0	
Approach LOS		F			F			F			F	

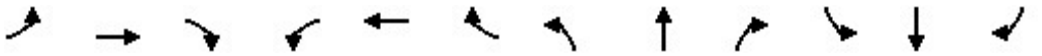
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	41.0	20.0	38.0	23.7	38.3	24.0	34.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	36.5	15.5	33.5	20.5	32.5	19.5	29.5
Max Q Clear Time (g_c+I1), s	18.5	38.5	17.5	35.5	18.9	29.6	21.5	31.5
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.3	2.3	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	109.7
HCM 6th LOS	F



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1800	1900	1900	1800	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.925	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	5085	1583	3072	5085	1583	1676	3539	1583	1676	3136	1441
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	5085	1583	3072	5085	1583	1676	3539	1583	1676	3136	1441
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			142			150			259		194	468
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



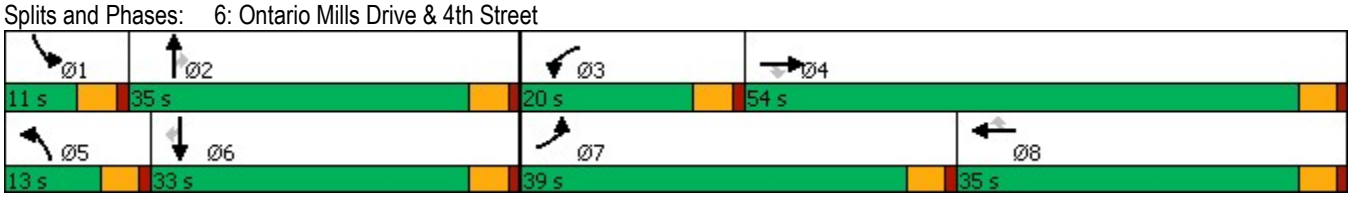
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1339	1749	168	316	1378	456	198	434	492	109	437	862
Future Volume (vph)	1339	1749	168	316	1378	456	198	434	492	109	437	862
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1455	1901	183	343	1498	496	215	472	535	118	475	937
Shared Lane Traffic (%)												50%
Lane Group Flow (vph)	1455	1901	183	343	1498	496	215	472	535	118	944	468

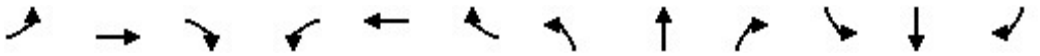
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1339	1749	168	316	1378	456	198	434	492	109	437	862
Future Volume (vph)	1339	1749	168	316	1378	456	198	434	492	109	437	862
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	39.0	54.0	54.0	20.0	35.0	35.0	13.0	35.0	35.0	11.0	33.0	33.0
Total Split (%)	32.5%	45.0%	45.0%	16.7%	29.2%	29.2%	10.8%	29.2%	29.2%	9.2%	27.5%	27.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	34.5	49.7	49.7	15.3	30.5	30.5	8.5	30.5	30.5	6.5	28.5	28.5
Actuated g/C Ratio	0.29	0.41	0.41	0.13	0.25	0.25	0.07	0.25	0.25	0.05	0.24	0.24
v/c Ratio	1.65	0.90	0.25	0.88	1.16	0.96	1.82	0.53	0.90	1.31	1.06	0.67
Control Delay	326.6	40.2	7.1	74.8	121.1	63.3	432.7	41.0	41.7	243.2	82.0	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	326.6	40.2	7.1	74.8	121.1	63.3	432.7	41.0	41.7	243.2	82.0	8.7
LOS	F	D	A	E	F	E	F	D	D	F	F	A
Approach Delay		156.2			102.1			110.2			72.0	
Approach LOS		F			F			F			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.82	
Intersection Signal Delay: 120.1	Intersection LOS: F
Intersection Capacity Utilization 117.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 6: Ontario Mills Drive & 4th Street



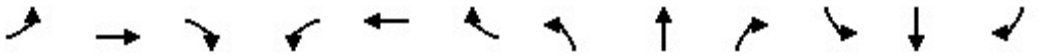


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1455	1901	183	343	1498	496	215	472	535	118	944	468
v/c Ratio	1.65	0.90	0.25	0.88	1.16	0.96	1.82	0.53	0.90	1.31	1.06	0.67
Control Delay	326.6	40.2	7.1	74.8	121.1	63.3	432.7	41.0	41.7	243.2	82.0	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	326.6	40.2	7.1	74.8	121.1	63.3	432.7	41.0	41.7	243.2	82.0	8.7
Queue Length 50th (ft)	~841	498	19	136	~502	283	~251	166	226	~117	~373	0
Queue Length 95th (ft)	#978	570	65	#216	#599	#506	#407	221	#439	#240	#513	107
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	883	2105	738	396	1292	514	118	899	595	90	892	699
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.65	0.90	0.25	0.87	1.16	0.96	1.82	0.53	0.90	1.31	1.06	0.67

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



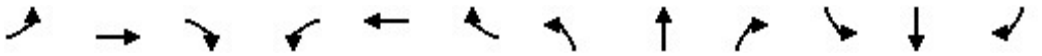
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1339	1749	168	316	1378	456	198	434	492	109	437	862
Future Volume (veh/h)	1339	1749	168	316	1378	456	198	434	492	109	437	862
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1772	1870	1870	1772	1870	1870
Adj Flow Rate, veh/h	1455	1901	183	343	1498	496	215	472	535	118	475	937
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	889	2121	659	390	1298	403	120	903	403	91	444	753
Arrive On Green	0.29	0.42	0.42	0.13	0.25	0.25	0.07	0.25	0.25	0.05	0.24	0.24
Sat Flow, veh/h	3092	5106	1585	3092	5106	1585	1688	3554	1585	1688	1870	3170
Grp Volume(v), veh/h	1455	1901	183	343	1498	496	215	472	535	118	475	937
Grp Sat Flow(s),veh/h/ln	1546	1702	1585	1546	1702	1585	1688	1777	1585	1688	1870	1585
Q Serve(g_s), s	34.5	41.6	9.2	13.1	30.5	30.5	8.5	13.7	30.5	6.5	28.5	28.5
Cycle Q Clear(g_c), s	34.5	41.6	9.2	13.1	30.5	30.5	8.5	13.7	30.5	6.5	28.5	28.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	889	2121	659	390	1298	403	120	903	403	91	444	753
V/C Ratio(X)	1.64	0.90	0.28	0.88	1.15	1.23	1.80	0.52	1.33	1.29	1.07	1.24
Avail Cap(c_a), veh/h	889	2121	659	399	1298	403	120	903	403	91	444	753
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.8	32.7	23.2	51.5	44.8	44.7	55.7	38.5	44.7	56.8	45.7	45.7
Incr Delay (d2), s/veh	291.7	5.5	0.2	19.3	78.6	124.0	390.6	0.5	163.9	190.8	62.4	121.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	49.0	17.8	3.5	6.1	22.2	25.7	16.6	6.0	30.2	7.6	20.8	23.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	334.4	38.1	23.4	70.8	123.3	168.7	446.3	39.0	208.6	247.6	108.2	166.8
LnGrp LOS	F	D	C	E	F	F	F	D	F	F	F	F
Approach Vol, veh/h		3539			2337			1222			1530	
Approach Delay, s/veh		159.2			125.3			184.9			154.9	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	35.0	19.6	54.4	13.0	33.0	39.0	35.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	30.5	15.5	49.5	8.5	28.5	34.5	30.5
Max Q Clear Time (g_c+I1), s	8.5	32.5	15.1	43.6	10.5	30.5	36.5	32.5
Green Ext Time (p_c), s	0.0	0.0	0.1	5.1	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	152.9
HCM 6th LOS	F

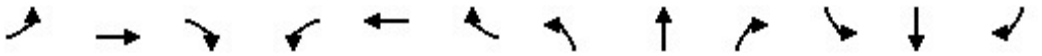
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.973			0.936				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.982	
Satd. Flow (prot)	3072	5085	1583	1676	4948	0	1676	3313	0	1593	1738	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.982	
Satd. Flow (perm)	3072	5085	1583	1676	4948	0	1676	3313	0	1593	1738	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			107		39			85				190
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



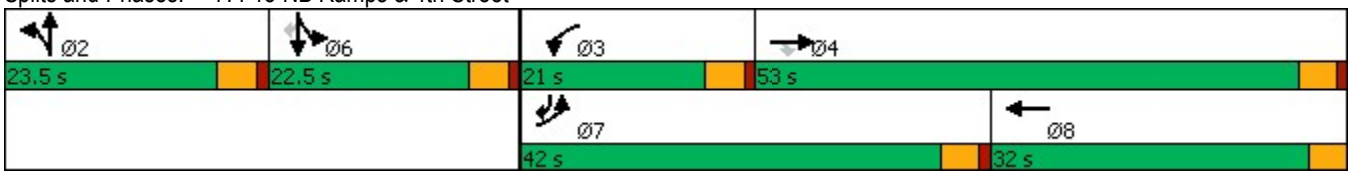
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1194	1008	135	111	1071	239	166	108	82	201	95	876
Future Volume (vph)	1194	1008	135	111	1071	239	166	108	82	201	95	876
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1244	1050	141	116	1116	249	173	113	85	209	99	913
Shared Lane Traffic (%)										27%		
Lane Group Flow (vph)	1244	1050	141	116	1365	0	173	198	0	153	155	913

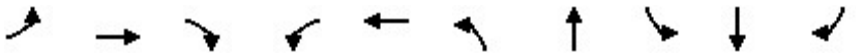
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	1194	1008	135	111	1071	166	108	201	95	876
Future Volume (vph)	1194	1008	135	111	1071	166	108	201	95	876
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	42.0	53.0	53.0	21.0	32.0	23.5	23.5	22.5	22.5	42.0
Total Split (%)	35.0%	44.2%	44.2%	17.5%	26.7%	19.6%	19.6%	18.8%	18.8%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	37.6	52.5	52.5	12.7	28.6	15.8	15.8	14.9	14.9	57.1
Actuated g/C Ratio	0.33	0.46	0.46	0.11	0.25	0.14	0.14	0.13	0.13	0.50
v/c Ratio	1.23	0.45	0.18	0.62	1.07	0.75	0.37	0.74	0.68	0.64
Control Delay	145.6	23.1	7.4	63.7	88.1	67.7	27.2	69.0	63.4	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	145.6	23.1	7.4	63.7	88.1	67.7	27.2	69.0	63.4	18.8
LOS	F	C	A	E	F	E	C	E	E	B
Approach Delay		84.8			86.2		46.1		30.8	
Approach LOS		F			F		D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 114	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.23	
Intersection Signal Delay: 70.6	Intersection LOS: E
Intersection Capacity Utilization 96.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street



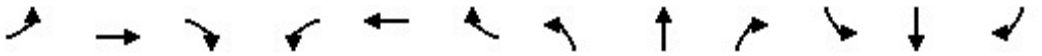


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1244	1050	141	116	1365	173	198	153	155	913
v/c Ratio	1.23	0.45	0.18	0.62	1.07	0.75	0.37	0.74	0.68	0.64
Control Delay	145.6	23.1	7.4	63.7	88.1	67.7	27.2	69.0	63.4	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	145.6	23.1	7.4	63.7	88.1	67.7	27.2	69.0	63.4	18.8
Queue Length 50th (ft)	~604	198	14	84	~419	125	40	116	116	221
Queue Length 95th (ft)	#769	264	57	147	#540	206	77	196	195	306
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	1014	2342	786	243	1270	280	625	252	275	1417
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.23	0.45	0.18	0.48	1.07	0.62	0.32	0.61	0.56	0.64

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1194	1008	135	111	1071	239	166	108	82	201	95	876
Future Volume (veh/h)	1194	1008	135	111	1071	239	166	108	82	201	95	876
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1772	1870	1870	1772	1870	1870	1772	1870	1772
Adj Flow Rate, veh/h	1244	1050	141	116	1116	249	173	112	85	154	176	912
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	996	2466	765	142	1022	228	209	247	173	261	289	1432
Arrive On Green	0.32	0.48	0.48	0.08	0.24	0.24	0.12	0.12	0.12	0.15	0.15	0.15
Sat Flow, veh/h	3092	5106	1585	1688	4175	931	1688	1996	1399	1688	1870	3003
Grp Volume(v), veh/h	1244	1050	141	116	910	455	173	99	98	154	176	912
Grp Sat Flow(s),veh/h/ln	1546	1702	1585	1688	1702	1703	1688	1777	1618	1688	1870	1502
Q Serve(g_s), s	37.5	15.6	5.9	7.9	28.5	28.5	11.7	6.0	6.6	9.9	10.2	18.0
Cycle Q Clear(g_c), s	37.5	15.6	5.9	7.9	28.5	28.5	11.7	6.0	6.6	9.9	10.2	18.0
Prop In Lane	1.00		1.00	1.00		0.55	1.00		0.86	1.00		1.00
Lane Grp Cap(c), veh/h	996	2466	765	142	833	417	209	220	201	261	289	1432
V/C Ratio(X)	1.25	0.43	0.18	0.82	1.09	1.09	0.83	0.45	0.49	0.59	0.61	0.64
Avail Cap(c_a), veh/h	996	2466	765	239	833	417	275	290	264	261	289	1432
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	19.6	17.1	52.5	44.0	44.0	49.8	47.3	47.6	45.8	45.9	22.9
Incr Delay (d2), s/veh	120.6	0.1	0.1	11.0	59.3	71.3	14.5	1.4	1.8	3.5	3.7	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	30.7	6.1	2.2	3.8	18.7	20.1	5.7	2.7	2.8	4.4	5.0	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	160.0	19.7	17.2	63.4	103.2	115.3	64.2	48.7	49.4	49.3	49.6	23.8
LnGrp LOS	F	B	B	E	F	F	E	D	D	D	D	C
Approach Vol, veh/h		2435			1481			370			1242	
Approach Delay, s/veh		91.3			103.8			56.2			30.6	
Approach LOS		F			F			E			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		18.9	14.3	60.7		22.5	42.0	33.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	* 4.5				
Max Green Setting (Gmax), s		19.0	16.5	48.5		18.0	37.5	* 29				
Max Q Clear Time (g_c+I1), s		13.7	9.9	17.6		20.0	39.5	30.5				
Green Ext Time (p_c), s		0.8	0.1	9.6		0.0	0.0	0.0				

Intersection Summary		
HCM 6th Ctrl Delay	78.7	
HCM 6th LOS	E	

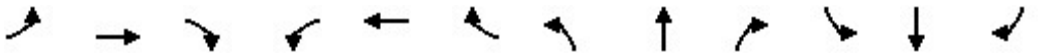
Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1600	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.907				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3210	0	4202	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3210	0	4202	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		92				149			149			149
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



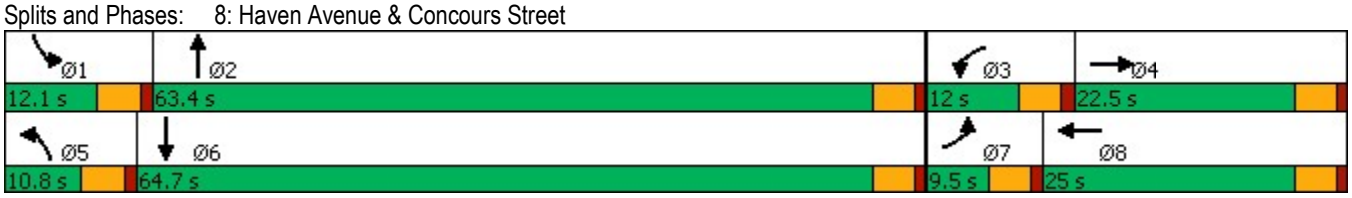
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	36	55	90	249	133	135	67	3307	286	178	2707	39
Future Volume (vph)	36	55	90	249	133	135	67	3307	286	178	2707	39
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	37	56	92	254	136	138	68	3374	292	182	2762	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	148	0	254	136	138	68	3374	292	182	2762	40

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	36	55	249	133	135	67	3307	286	178	2707	39
Future Volume (vph)	36	55	249	133	135	67	3307	286	178	2707	39
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	12.0	25.0		10.8	63.4		12.1	64.7	
Total Split (%)	8.6%	20.5%	10.9%	22.7%		9.8%	57.6%		11.0%	58.8%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.0	7.4	7.5	13.8	99.4	6.2	58.9	99.4	7.6	62.4	99.4
Actuated g/C Ratio	0.05	0.07	0.08	0.14	1.00	0.06	0.59	1.00	0.08	0.63	1.00
v/c Ratio	0.24	0.46	0.80	0.28	0.09	0.36	0.89	0.18	0.78	0.69	0.03
Control Delay	50.0	23.2	65.3	41.5	0.1	50.7	21.6	0.3	68.3	14.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	23.2	65.3	41.5	0.1	50.7	21.6	0.3	68.3	14.0	0.0
LOS	D	C	E	D	A	D	C	A	E	B	A
Approach Delay		28.6		42.1			20.5			17.1	
Approach LOS		C		D			C			B	

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 99.4	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 20.8	Intersection LOS: C
Intersection Capacity Utilization 78.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	37	148	254	136	138	68	3374	292	182	2762	40
v/c Ratio	0.24	0.46	0.80	0.28	0.09	0.36	0.89	0.18	0.78	0.69	0.03
Control Delay	50.0	23.2	65.3	41.5	0.1	50.7	21.6	0.3	68.3	14.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	23.2	65.3	41.5	0.1	50.7	21.6	0.3	68.3	14.0	0.0
Queue Length 50th (ft)	11	17	57	43	0	21	494	0	59	323	0
Queue Length 95th (ft)	28	48	#103	73	0	44	597	0	#118	395	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	154	656	316	729	1583	194	3796	1583	234	4022	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.23	0.80	0.19	0.09	0.35	0.89	0.18	0.78	0.69	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	55	90	249	133	135	67	3307	286	178	2707	39
Future Volume (veh/h)	36	55	90	249	133	135	67	3307	286	178	2707	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1575	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	37	56	92	254	136	0	68	3374	0	182	2762	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	145	129	317	443		131	3779		235	3995	
Arrive On Green	0.03	0.08	0.08	0.08	0.12	0.00	0.04	0.59	0.00	0.08	0.62	0.00
Sat Flow, veh/h	3092	1777	1585	4230	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	37	56	92	254	136	0	68	3374	0	182	2762	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1410	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	1.2	3.0	5.7	5.9	3.5	0.0	2.2	45.5	0.0	5.8	28.5	0.0
Cycle Q Clear(g_c), s	1.2	3.0	5.7	5.9	3.5	0.0	2.2	45.5	0.0	5.8	28.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	99	145	129	317	443		131	3779		235	3995	
V/C Ratio(X)	0.37	0.39	0.71	0.80	0.31		0.52	0.89		0.77	0.69	
Avail Cap(c_a), veh/h	155	320	285	317	729		195	3790		235	3995	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	47.4	43.5	44.8	45.5	39.8	0.0	46.9	17.9	0.0	45.4	12.6	0.0
Incr Delay (d2), s/veh	2.3	1.7	7.0	13.6	0.4	0.0	3.1	3.1	0.0	14.8	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.4	2.5	2.5	1.5	0.0	0.9	16.0	0.0	2.7	9.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.7	45.2	51.8	59.1	40.2	0.0	50.0	21.0	0.0	60.2	13.1	0.0
LnGrp LOS	D	D	D	E	D		D	C		E	B	
Approach Vol, veh/h		185			390	A		3442	A		2944	A
Approach Delay, s/veh		49.4			52.5			21.6			16.0	
Approach LOS		D			D			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.1	63.2	12.0	12.7	8.7	66.6	7.7	17.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.6	58.9	7.5	18.0	6.3	60.2	5.0	20.5
Max Q Clear Time (g_c+I1), s	7.8	47.5	7.9	7.7	4.2	30.5	3.2	5.5
Green Ext Time (p_c), s	0.0	11.2	0.0	0.5	0.0	26.3	0.0	0.6

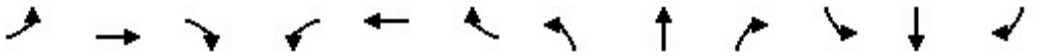
Intersection Summary	
HCM 6th Ctrl Delay	21.7
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1900	1900	1900	1900	1800	1900	1900	1800	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.975			0.946						0.985	
Flt Protected	0.950	0.960			0.971		0.950			0.950		
Satd. Flow (prot)	1593	1656	0	0	1711	0	1676	5085	0	1676	5009	0
Flt Permitted	0.950	0.960					0.950			0.950		
Satd. Flow (perm)	1593	1656	0	0	1762	0	1676	5085	0	1676	5009	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		95			95						22	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



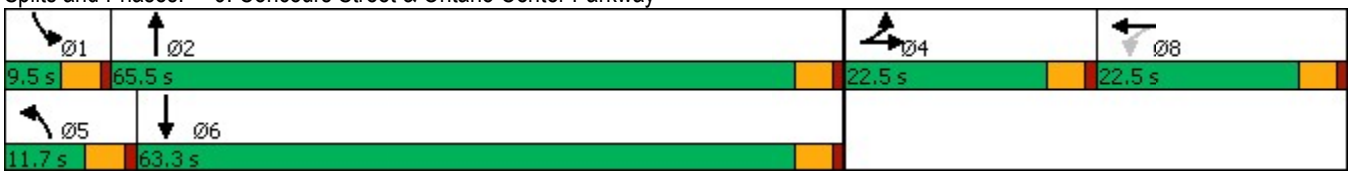
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	189	0	17	20	0	13	36	2522	7	1	1521	169
Future Volume (vph)	189	0	17	20	0	13	36	2522	7	1	1521	169
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	199	0	18	21	0	14	38	2655	7	1	1601	178
Shared Lane Traffic (%)	45%											
Lane Group Flow (vph)	109	108	0	0	35	0	38	2662	0	1	1779	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	189	0	20	0	36	2522	1	1521
Future Volume (vph)	189	0	20	0	36	2522	1	1521
Turn Type	Split	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	4	4		8	5	2	1	6
Permitted Phases			8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	11.7	65.5	9.5	63.3
Total Split (%)	18.8%	18.8%	18.8%	18.8%	9.8%	54.6%	7.9%	52.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	12.0	12.0		5.5	6.7	66.9	5.0	61.9
Actuated g/C Ratio	0.13	0.13		0.06	0.07	0.70	0.05	0.65
v/c Ratio	0.55	0.37		0.18	0.32	0.75	0.01	0.55
Control Delay	50.2	14.6		2.1	52.3	13.1	48.0	12.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	50.2	14.6		2.1	52.3	13.1	48.0	12.3
LOS	D	B		A	D	B	D	B
Approach Delay		32.5		2.1		13.6		12.3
Approach LOS		C		A		B		B

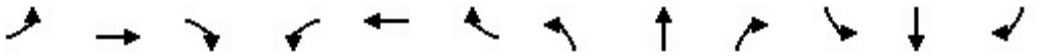
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 95.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 13.9	Intersection LOS: B
Intersection Capacity Utilization 65.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	109	108	35	38	2662	1	1779
v/c Ratio	0.55	0.37	0.18	0.32	0.75	0.01	0.55
Control Delay	50.2	14.6	2.1	52.3	13.1	48.0	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.2	14.6	2.1	52.3	13.1	48.0	12.3
Queue Length 50th (ft)	63	7	0	21	358	1	255
Queue Length 95th (ft)	130	58	0	60	652	7	341
Internal Link Dist (ft)		319	68		111		176
Turn Bay Length (ft)	170			115		120	
Base Capacity (vph)	303	392	412	127	3567	88	3369
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.28	0.08	0.30	0.75	0.01	0.53

Intersection Summary



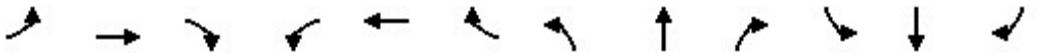
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	189	0	17	20	0	13	36	2522	7	1	1521	169
Future Volume (veh/h)	189	0	17	20	0	13	36	2522	7	1	1521	169
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1870	1870	1870	1870	1870	1772	1870	1870	1772	1870	1870
Adj Flow Rate, veh/h	216	0	0	21	0	14	38	2655	7	1	1601	178
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	308	170	0	34	0	22	59	3484	9	2	2934	326
Arrive On Green	0.09	0.00	0.00	0.03	0.00	0.03	0.03	0.66	0.66	0.00	0.63	0.63
Sat Flow, veh/h	3375	1870	0	1018	0	679	1688	5258	14	1688	4664	518
Grp Volume(v), veh/h	216	0	0	35	0	0	38	1718	944	1	1168	611
Grp Sat Flow(s),veh/h/ln	1688	1870	0	1697	0	0	1688	1702	1868	1688	1702	1777
Q Serve(g_s), s	5.3	0.0	0.0	1.7	0.0	0.0	1.9	29.2	29.3	0.1	16.5	16.5
Cycle Q Clear(g_c), s	5.3	0.0	0.0	1.7	0.0	0.0	1.9	29.2	29.3	0.1	16.5	16.5
Prop In Lane	1.00		0.00	0.60		0.40	1.00		0.01	1.00		0.29
Lane Grp Cap(c), veh/h	308	170	0	56	0	0	59	2256	1238	2	2142	1118
V/C Ratio(X)	0.70	0.00	0.00	0.62	0.00	0.00	0.65	0.76	0.76	0.43	0.55	0.55
Avail Cap(c_a), veh/h	715	396	0	360	0	0	143	2444	1341	99	2355	1230
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.5	0.0	0.0	40.6	0.0	0.0	40.5	9.8	9.8	42.4	8.9	8.9
Incr Delay (d2), s/veh	2.9	0.0	0.0	10.8	0.0	0.0	11.3	1.3	2.4	93.4	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.0	0.9	0.0	0.0	1.0	9.2	10.5	0.1	5.3	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.4	0.0	0.0	51.3	0.0	0.0	51.8	11.1	12.2	135.8	9.1	9.3
LnGrp LOS	D	A	A	D	A	A	D	B	B	F	A	A
Approach Vol, veh/h		216			35			2700			1780	
Approach Delay, s/veh		40.4			51.3			12.1			9.3	
Approach LOS		D			D			B			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	60.8		12.2	7.5	58.0		7.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	61.0		18.0	7.2	58.8		18.0				
Max Q Clear Time (g_c+I1), s	2.1	31.3		7.3	3.9	18.5		3.7				
Green Ext Time (p_c), s	0.0	25.0		0.5	0.0	19.3		0.1				

Intersection Summary		
HCM 6th Ctrl Delay		12.6
HCM 6th LOS		B

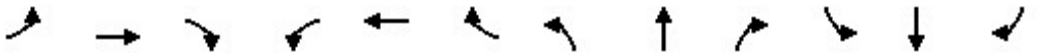
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			299			193			193			193
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



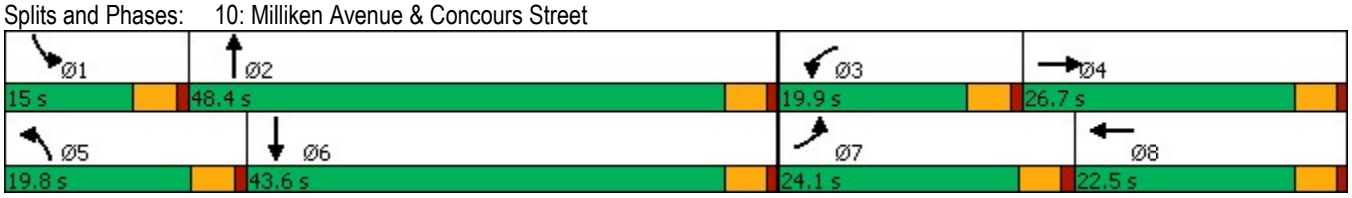
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	512	186	287	242	96	168	366	2329	182	258	1735	226
Future Volume (vph)	512	186	287	242	96	168	366	2329	182	258	1735	226
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	533	194	299	252	100	175	381	2426	190	269	1807	235
Shared Lane Traffic (%)												
Lane Group Flow (vph)	533	194	299	252	100	175	381	2426	190	269	1807	235

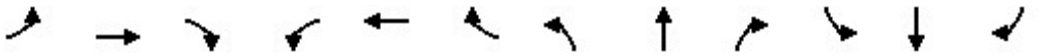
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	512	186	287	242	96	168	366	2329	182	258	1735	226
Future Volume (vph)	512	186	287	242	96	168	366	2329	182	258	1735	226
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	24.1	26.7		19.9	22.5		19.8	48.4		15.0	43.6	
Total Split (%)	21.9%	24.3%		18.1%	20.5%		18.0%	44.0%		13.6%	39.6%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	19.6	14.8	100.2	13.0	8.2	100.2	15.1	43.9	100.2	10.5	39.3	100.2
Actuated g/C Ratio	0.20	0.15	1.00	0.13	0.08	1.00	0.15	0.44	1.00	0.10	0.39	1.00
v/c Ratio	0.89	0.37	0.19	0.63	0.34	0.11	0.83	0.86	0.12	0.84	0.72	0.15
Control Delay	57.9	41.4	0.3	48.7	46.7	0.1	57.7	29.8	0.2	67.3	28.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.9	41.4	0.3	48.7	46.7	0.1	57.7	29.8	0.2	67.3	28.0	0.2
LOS	E	D	A	D	D	A	E	C	A	E	C	A
Approach Delay		38.0			32.2			31.5			29.7	
Approach LOS		D			C			C			C	

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 100.2	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 31.9	Intersection LOS: C
Intersection Capacity Utilization 77.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 10: Milliken Avenue & Concours Street

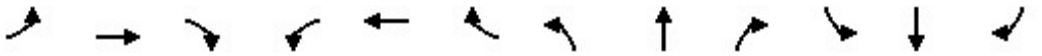




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	533	194	299	252	100	175	381	2426	190	269	1807	235
v/c Ratio	0.89	0.37	0.19	0.63	0.34	0.11	0.83	0.86	0.12	0.84	0.72	0.15
Control Delay	57.9	41.4	0.3	48.7	46.7	0.1	57.7	29.8	0.2	67.3	28.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.9	41.4	0.3	48.7	46.7	0.1	57.7	29.8	0.2	67.3	28.0	0.2
Queue Length 50th (ft)	172	60	0	79	32	0	123	397	0	88	279	0
Queue Length 95th (ft)	#273	96	0	120	58	0	#200	467	0	#160	335	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	600	784	1583	471	635	1583	468	2806	1583	321	2515	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.25	0.19	0.54	0.16	0.11	0.81	0.86	0.12	0.84	0.72	0.15

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



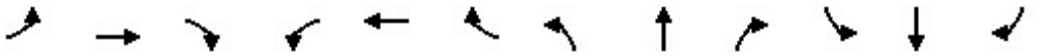
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	512	186	287	242	96	168	366	2329	182	258	1735	226
Future Volume (veh/h)	512	186	287	242	96	168	366	2329	182	258	1735	226
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	533	194	0	252	100	0	381	2426	0	269	1807	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	599	504		325	189		447	2929		330	2686	
Arrive On Green	0.19	0.14	0.00	0.11	0.05	0.00	0.14	0.46	0.00	0.11	0.42	0.00
Sat Flow, veh/h	3092	3554	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	533	194	0	252	100	0	381	2426	0	269	1807	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	15.8	4.7	0.0	7.5	2.6	0.0	11.3	31.0	0.0	8.0	21.4	0.0
Cycle Q Clear(g_c), s	15.8	4.7	0.0	7.5	2.6	0.0	11.3	31.0	0.0	8.0	21.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	599	504		325	189		447	2929		330	2686	
V/C Ratio(X)	0.89	0.39		0.78	0.53		0.85	0.83		0.81	0.67	
Avail Cap(c_a), veh/h	644	838		506	679		502	3000		345	2686	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	37.0	36.7	0.0	41.1	43.4	0.0	39.3	22.4	0.0	41.1	22.2	0.0
Incr Delay (d2), s/veh	13.9	0.5	0.0	4.0	2.3	0.0	12.2	2.0	0.0	13.5	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	2.0	0.0	3.0	1.2	0.0	5.0	11.5	0.0	3.6	7.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.9	37.2	0.0	45.0	45.7	0.0	51.4	24.4	0.0	54.7	22.9	0.0
LnGrp LOS	D	D		D	D		D	C		D	C	
Approach Vol, veh/h		727	A		352	A		2807	A		2076	A
Approach Delay, s/veh		47.2			45.2			28.1			27.0	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.6	47.4	14.4	17.8	18.1	43.8	22.7	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	43.9	15.4	22.2	15.3	39.1	19.6	18.0
Max Q Clear Time (g_c+I1), s	10.0	33.0	9.5	6.7	13.3	23.4	17.8	4.6
Green Ext Time (p_c), s	0.1	9.8	0.4	1.0	0.3	11.3	0.4	0.4

Intersection Summary	
HCM 6th Ctrl Delay	31.1
HCM 6th LOS	C

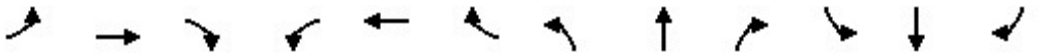
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1600	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3539	1583	4202	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3539	1583	4202	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55			177			238			177
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



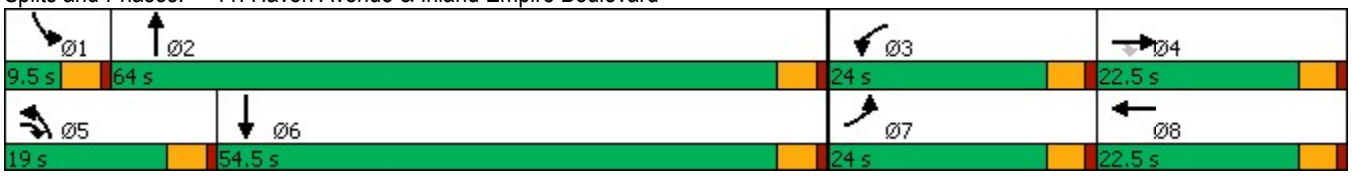
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	278	306	676	893	220	57	492	2692	609	58	3132	151
Future Volume (vph)	278	306	676	893	220	57	492	2692	609	58	3132	151
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	299	329	727	960	237	61	529	2895	655	62	3368	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	299	329	727	960	237	61	529	2895	655	62	3368	162

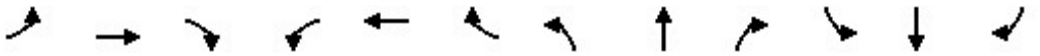
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	278	306	676	893	220	57	492	2692	609	58	3132	151
Future Volume (vph)	278	306	676	893	220	57	492	2692	609	58	3132	151
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	24.0	22.5	19.0	24.0	22.5		19.0	64.0		9.5	54.5	
Total Split (%)	20.0%	18.8%	15.8%	20.0%	18.8%		15.8%	53.3%		7.9%	45.4%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	16.3	15.6	34.6	19.5	18.9	117.7	14.5	61.5	117.7	5.0	50.0	117.7
Actuated g/C Ratio	0.14	0.13	0.29	0.17	0.16	1.00	0.12	0.52	1.00	0.04	0.42	1.00
v/c Ratio	0.71	0.70	1.44	1.38	0.42	0.04	1.40	0.86	0.41	0.48	1.24	0.10
Control Delay	57.9	57.3	240.1	217.2	47.6	0.1	233.1	28.8	0.8	68.1	141.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.9	57.3	240.1	217.2	47.6	0.1	233.1	28.8	0.8	68.1	141.1	0.1
LOS	E	E	F	F	D	A	F	C	A	E	F	A
Approach Delay		155.5			174.7			50.8			133.5	
Approach LOS		F			F			D			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.44	
Intersection Signal Delay: 108.7	Intersection LOS: F
Intersection Capacity Utilization 118.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	299	329	727	960	237	61	529	2895	655	62	3368	162
v/c Ratio	0.71	0.70	1.44	1.38	0.42	0.04	1.40	0.86	0.41	0.48	1.24	0.10
Control Delay	57.9	57.3	240.1	217.2	47.6	0.1	233.1	28.8	0.8	68.1	141.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.9	57.3	240.1	217.2	47.6	0.1	233.1	28.8	0.8	68.1	141.1	0.1
Queue Length 50th (ft)	113	127	~723	~345	86	0	~278	561	0	24	~928	0
Queue Length 95th (ft)	160	177	#961	#442	131	0	#395	637	0	48	#1015	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	509	541	504	696	567	1583	378	3348	1583	130	2724	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.61	1.44	1.38	0.42	0.04	1.40	0.86	0.41	0.48	1.24	0.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

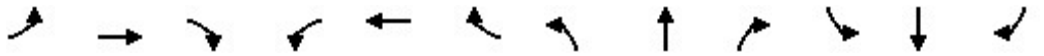
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	278	306	676	893	220	57	492	2692	609	58	3132	151
Future Volume (veh/h)	278	306	676	893	220	57	492	2692	609	58	3132	151
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1575	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	299	329	727	960	237	0	529	2895	0	62	3368	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	358	533	429	687	699		374	3224		113	2681	
Arrive On Green	0.12	0.15	0.15	0.16	0.20	0.00	0.12	0.50	0.00	0.04	0.42	0.00
Sat Flow, veh/h	3092	3554	1585	4230	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	299	329	727	960	237	0	529	2895	0	62	3368	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1410	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	11.4	10.4	18.0	19.5	6.9	0.0	14.5	49.0	0.0	2.4	50.0	0.0
Cycle Q Clear(g_c), s	11.4	10.4	18.0	19.5	6.9	0.0	14.5	49.0	0.0	2.4	50.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	358	533	429	687	699		374	3224		113	2681	
V/C Ratio(X)	0.83	0.62	1.69	1.40	0.34		1.42	0.90		0.55	1.26	
Avail Cap(c_a), veh/h	502	533	429	687	699		374	3224		129	2681	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	51.9	47.8	43.7	50.3	41.5	0.0	52.8	27.1	0.0	56.9	35.0	0.0
Incr Delay (d2), s/veh	8.3	2.1	322.0	187.3	0.3	0.0	202.3	3.8	0.0	4.2	118.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	4.8	51.0	18.8	3.1	0.0	16.1	18.9	0.0	1.0	41.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.2	49.9	365.8	237.5	41.8	0.0	255.1	31.0	0.0	61.0	153.5	0.0
LnGrp LOS	E	D	F	F	D		F	C		E	F	
Approach Vol, veh/h		1355			1197	A		3424	A		3430	A
Approach Delay, s/veh		221.7			198.7			65.6			151.9	
Approach LOS		F			F			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.9	64.6	24.0	22.5	19.0	54.5	18.4	28.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	59.5	19.5	18.0	14.5	50.0	19.5	18.0
Max Q Clear Time (g_c+I1), s	4.4	51.0	21.5	20.0	16.5	52.0	13.4	8.9
Green Ext Time (p_c), s	0.0	8.2	0.0	0.0	0.0	0.0	0.5	0.9

Intersection Summary	
HCM 6th Ctrl Delay	136.5
HCM 6th LOS	F

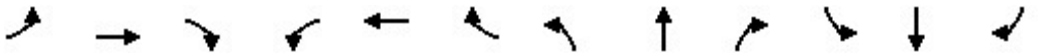
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			397			177			177			177
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



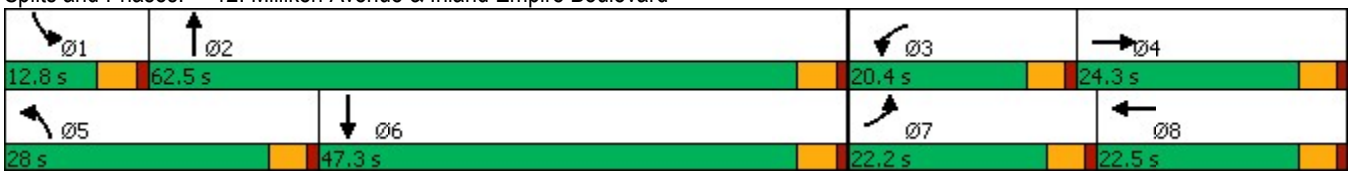
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	412	402	452	297	109	137	548	2316	511	135	2037	166
Future Volume (vph)	412	402	452	297	109	137	548	2316	511	135	2037	166
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	434	423	476	313	115	144	577	2438	538	142	2144	175
Shared Lane Traffic (%)												
Lane Group Flow (vph)	434	423	476	313	115	144	577	2438	538	142	2144	175

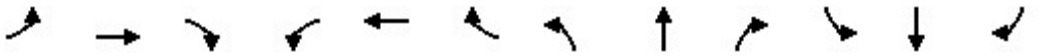
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	412	402	452	297	109	137	548	2316	511	135	2037	166
Future Volume (vph)	412	402	452	297	109	137	548	2316	511	135	2037	166
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	22.2	24.3		20.4	22.5		28.0	62.5		12.8	47.3	
Total Split (%)	18.5%	20.3%		17.0%	18.8%		23.3%	52.1%		10.7%	39.4%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	17.7	18.0	117.4	15.1	15.4	117.4	23.4	58.1	117.4	8.2	42.9	117.4
Actuated g/C Ratio	0.15	0.15	1.00	0.13	0.13	1.00	0.20	0.49	1.00	0.07	0.37	1.00
v/c Ratio	0.94	0.78	0.30	0.79	0.25	0.09	0.94	0.77	0.34	0.67	0.92	0.11
Control Delay	78.7	58.8	0.5	65.3	46.8	0.1	71.6	26.6	0.6	69.6	43.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.7	58.8	0.5	65.3	46.8	0.1	71.6	26.6	0.6	69.6	43.3	0.1
LOS	E	E	A	E	D	A	E	C	A	E	D	A
Approach Delay		44.4			45.2			30.0			41.7	
Approach LOS		D			D			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.4	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 37.1	Intersection LOS: D
Intersection Capacity Utilization 82.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	434	423	476	313	115	144	577	2438	538	142	2144	175
v/c Ratio	0.94	0.78	0.30	0.79	0.25	0.09	0.94	0.77	0.34	0.67	0.92	0.11
Control Delay	78.7	58.8	0.5	65.3	46.8	0.1	71.6	26.6	0.6	69.6	43.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.7	58.8	0.5	65.3	46.8	0.1	71.6	26.6	0.6	69.6	43.3	0.1
Queue Length 50th (ft)	173	165	0	121	41	0	229	442	0	56	460	0
Queue Length 95th (ft)	#276	222	0	#184	71	0	#343	492	0	#97	#525	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	463	597	1583	416	543	1583	615	3172	1583	217	2339	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.71	0.30	0.75	0.21	0.09	0.94	0.77	0.34	0.65	0.92	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	412	402	452	297	109	137	548	2316	511	135	2037	166
Future Volume (veh/h)	412	402	452	297	109	137	548	2316	511	135	2037	166
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	434	423	0	313	115	0	577	2438	0	142	2144	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	482	510		370	381		627	3312		193	2410	
Arrive On Green	0.16	0.14	0.00	0.12	0.11	0.00	0.20	0.51	0.00	0.06	0.37	0.00
Sat Flow, veh/h	3092	3554	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	434	423	0	313	115	0	577	2438	0	142	2144	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	15.5	13.1	0.0	11.2	3.4	0.0	20.6	33.4	0.0	5.1	35.3	0.0
Cycle Q Clear(g_c), s	15.5	13.1	0.0	11.2	3.4	0.0	20.6	33.4	0.0	5.1	35.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	482	510		370	381		627	3312		193	2410	
V/C Ratio(X)	0.90	0.83		0.85	0.30		0.92	0.74		0.73	0.89	
Avail Cap(c_a), veh/h	485	624		436	567		644	3312		228	2441	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	46.8	47.0	0.0	48.6	46.4	0.0	44.1	21.4	0.0	52.0	33.1	0.0
Incr Delay (d2), s/veh	19.6	7.7	0.0	12.7	0.4	0.0	18.4	0.9	0.0	9.8	4.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	6.3	0.0	5.0	1.5	0.0	9.4	12.3	0.0	2.2	14.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.4	54.7	0.0	61.3	46.9	0.0	62.4	22.3	0.0	61.7	37.6	0.0
LnGrp LOS	E	D		E	D		E	C		E	D	
Approach Vol, veh/h		857	A		428	A		3015	A		2286	A
Approach Delay, s/veh		60.6			57.4			30.0			39.1	
Approach LOS		E			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.6	62.6	18.0	20.7	27.4	46.7	22.1	16.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.3	58.0	15.9	19.8	23.5	42.8	17.7	18.0
Max Q Clear Time (g_c+I1), s	7.1	35.4	13.2	15.1	22.6	37.3	17.5	5.4
Green Ext Time (p_c), s	0.0	19.1	0.3	1.1	0.2	5.0	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	38.9
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1800	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.984	0.850				
Flt Protected	0.957					
Satd. Flow (prot)	3224	1441	6408	0	0	6408
Flt Permitted	0.957					
Satd. Flow (perm)	3224	1441	6408	0	0	6408
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	698	440	3167	0	0	3173
Future Volume (vph)	698	440	3167	0	0	3173
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	727	458	3299	0	0	3305
Shared Lane Traffic (%)		19%				
Lane Group Flow (vph)	814	371	3299	0	0	3305

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	698	440	3167	3173
Future Volume (vph)	698	440	3167	3173
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	41.0	41.0
Total Split (%)	36.9%	36.9%	63.1%	63.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	19.0	19.0	36.5	36.5
Actuated g/C Ratio	0.29	0.29	0.57	0.57
v/c Ratio	0.86	0.88	0.91	0.91
Control Delay	32.6	46.0	17.8	17.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	32.6	46.0	17.8	17.9
LOS	C	D	B	B
Approach Delay	36.8		17.8	17.9
Approach LOS	D		B	B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 64.5	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 20.8	Intersection LOS: C
Intersection Capacity Utilization 83.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	814	371	3299	3305
v/c Ratio	0.86	0.88	0.91	0.91
Control Delay	32.6	46.0	17.8	17.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	32.6	46.0	17.8	17.9
Queue Length 50th (ft)	154	150	309	310
Queue Length 95th (ft)	#246	#307	#375	#378
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	975	436	3628	3628
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.83	0.85	0.91	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

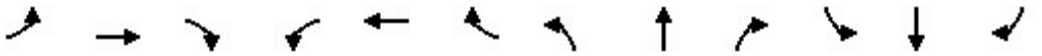
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	698	440	3167	0	0	3173
Future Volume (veh/h)	698	440	3167	0	0	3173
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1772	1870	1870	0	0	1870
Adj Flow Rate, veh/h	786	395	3299	0	0	3305
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	970	456	3677	0	0	3677
Arrive On Green	0.29	0.29	0.57	0.00	0.00	0.57
Sat Flow, veh/h	3375	1585	6958	0	0	6958
Grp Volume(v), veh/h	786	395	3299	0	0	3305
Grp Sat Flow(s),veh/h/ln	1688	1585	1609	0	0	1609
Q Serve(g_s), s	13.8	15.1	28.8	0.0	0.0	28.9
Cycle Q Clear(g_c), s	13.8	15.1	28.8	0.0	0.0	28.9
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	970	456	3677	0	0	3677
V/C Ratio(X)	0.81	0.87	0.90	0.00	0.00	0.90
Avail Cap(c_a), veh/h	1032	485	3683	0	0	3683
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	21.1	21.6	12.0	0.0	0.0	12.0
Incr Delay (d2), s/veh	4.7	14.7	3.3	0.0	0.0	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	7.0	8.8	0.0	0.0	8.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	25.8	36.2	15.4	0.0	0.0	15.4
LnGrp LOS	C	D	B	A	A	B
Approach Vol, veh/h	1181		3299			3305
Approach Delay, s/veh	29.3		15.4			15.4
Approach LOS	C		B			B

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		40.9			40.9	22.8
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		36.5			36.5	19.5
Max Q Clear Time (g_c+I1), s		30.8			30.9	17.1
Green Ext Time (p_c), s		5.7			5.6	1.2

Intersection Summary	
HCM 6th Ctrl Delay	17.5
HCM 6th LOS	B

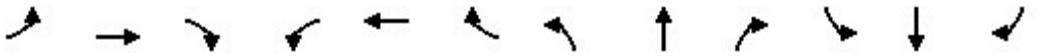
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	1863	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	1863	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			147			136			182			55
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



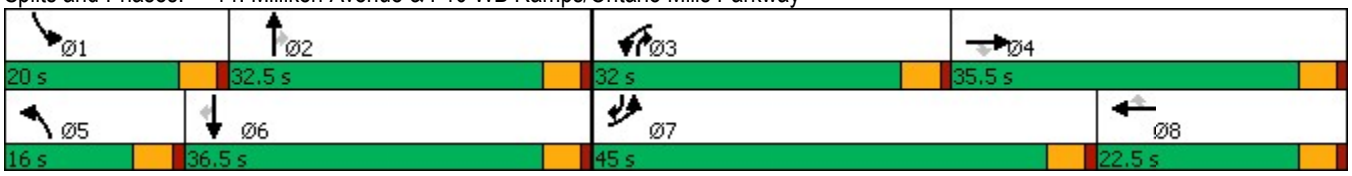
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1162	275	332	354	421	89	337	1441	634	465	1572	670
Future Volume (vph)	1162	275	332	354	421	89	337	1441	634	465	1572	670
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1210	286	346	369	439	93	351	1501	660	484	1638	698
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1210	286	346	369	439	93	351	1501	660	484	1638	698

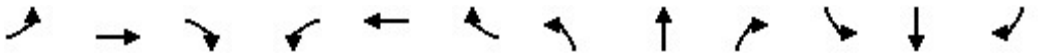
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1162	275	332	354	421	89	337	1441	634	465	1572	670
Future Volume (vph)	1162	275	332	354	421	89	337	1441	634	465	1572	670
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	45.0	35.5	35.5	32.0	22.5	22.5	16.0	32.5	32.0	20.0	36.5	45.0
Total Split (%)	37.5%	29.6%	29.6%	26.7%	18.8%	18.8%	13.3%	27.1%	26.7%	16.7%	30.4%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	40.5	36.3	36.3	21.7	17.5	17.5	11.5	28.0	54.2	15.5	32.0	77.0
Actuated g/C Ratio	0.34	0.30	0.30	0.18	0.15	0.15	0.10	0.23	0.45	0.13	0.27	0.64
v/c Ratio	1.16	0.51	0.59	0.66	0.85	0.27	1.19	1.00	0.81	1.22	0.95	0.67
Control Delay	120.5	39.3	25.5	51.0	65.9	4.3	160.0	69.0	28.2	162.4	56.6	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	120.5	39.3	25.5	51.0	65.9	4.3	160.0	69.0	28.2	162.4	56.6	16.2
LOS	F	D	C	D	E	A	F	E	C	F	E	B
Approach Delay		90.0			53.5			71.0			64.8	
Approach LOS		F			D			E			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.5	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.22	
Intersection Signal Delay: 71.2	Intersection LOS: E
Intersection Capacity Utilization 99.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway



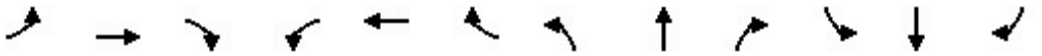


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1210	286	346	369	439	93	351	1501	660	484	1638	698
v/c Ratio	1.16	0.51	0.59	0.66	0.85	0.27	1.19	1.00	0.81	1.22	0.95	0.67
Control Delay	120.5	39.3	25.5	51.0	65.9	4.3	160.0	69.0	28.2	162.4	56.6	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	120.5	39.3	25.5	51.0	65.9	4.3	160.0	69.0	28.2	162.4	56.6	16.2
Queue Length 50th (ft)	~574	180	128	139	175	0	~169	~342	330	~237	364	292
Queue Length 95th (ft)	#708	288	249	179	#254	18	#266	#429	456	#345	#444	427
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	1041	566	583	707	532	354	295	1502	885	398	1716	1039
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.16	0.51	0.59	0.52	0.83	0.26	1.19	1.00	0.75	1.22	0.95	0.67

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1162	275	332	354	421	89	337	1441	634	465	1572	670
Future Volume (veh/h)	1162	275	332	354	421	89	337	1441	634	465	1572	670
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	1210	286	346	369	439	93	351	1501	660	484	1638	698
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1053	638	540	439	506	225	299	1515	598	403	1731	966
Arrive On Green	0.34	0.34	0.34	0.14	0.14	0.14	0.10	0.24	0.24	0.13	0.27	0.27
Sat Flow, veh/h	3092	1870	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	1210	286	346	369	439	93	351	1501	660	484	1638	698
Grp Sat Flow(s),veh/h/ln	1546	1870	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	40.5	14.1	21.9	13.8	14.4	6.4	11.5	27.7	28.0	15.5	29.7	32.0
Cycle Q Clear(g_c), s	40.5	14.1	21.9	13.8	14.4	6.4	11.5	27.7	28.0	15.5	29.7	32.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1053	638	540	439	506	225	299	1515	598	403	1731	966
V/C Ratio(X)	1.15	0.45	0.64	0.84	0.87	0.41	1.17	0.99	1.10	1.20	0.95	0.72
Avail Cap(c_a), veh/h	1053	638	540	715	538	240	299	1515	598	403	1731	966
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.2	30.5	33.0	49.7	49.9	46.5	53.7	45.3	37.0	51.7	42.6	16.2
Incr Delay (d2), s/veh	78.4	0.5	2.5	4.9	13.6	1.2	107.7	20.9	68.5	112.0	11.4	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	26.6	6.5	8.7	5.6	7.3	2.6	8.9	13.2	28.3	12.3	13.0	13.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	117.6	31.0	35.6	54.6	63.5	47.7	161.5	66.2	105.5	163.7	54.0	18.9
LnGrp LOS	F	C	D	D	E	D	F	E	F	F	D	B
Approach Vol, veh/h		1842			901			2512			2820	
Approach Delay, s/veh		88.7			58.2			89.8			64.1	
Approach LOS		F			E			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	32.5	21.4	45.0	16.0	36.5	45.0	21.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	28.0	27.5	31.0	11.5	32.0	40.5	18.0
Max Q Clear Time (g_c+I1), s	17.5	30.0	15.8	23.9	13.5	34.0	42.5	16.4
Green Ext Time (p_c), s	0.0	0.0	1.0	1.8	0.0	0.0	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	77.1
HCM 6th LOS	E

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.993	0.850				
Flt Protected	0.954					
Satd. Flow (prot)	3243	1441	0	6408	6408	0
Flt Permitted	0.954					
Satd. Flow (perm)	3243	1441	0	6408	6408	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	2	2				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

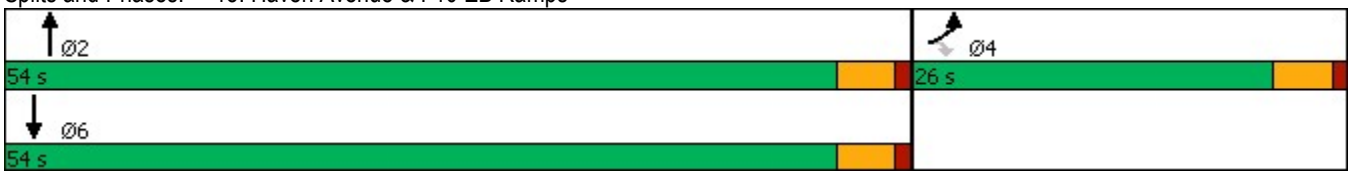
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	746	345	0	3451	2660	0
Future Volume (vph)	746	345	0	3451	2660	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	777	359	0	3595	2771	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	813	323	0	3595	2771	0

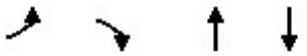
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	746	345	3451	2660
Future Volume (vph)	746	345	3451	2660
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	54.0	54.0
Total Split (%)	32.5%	32.5%	67.5%	67.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	21.5	21.5	49.5	49.5
Actuated g/C Ratio	0.27	0.27	0.62	0.62
v/c Ratio	0.93	0.83	0.91	0.70
Control Delay	47.7	47.9	17.8	11.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	47.7	47.9	17.8	11.5
LOS	D	D	B	B
Approach Delay	47.7		17.8	11.5
Approach LOS	D		B	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 20.0	Intersection LOS: B
Intersection Capacity Utilization 83.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	813	323	3595	2771
v/c Ratio	0.93	0.83	0.91	0.70
Control Delay	47.7	47.9	17.8	11.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	47.7	47.9	17.8	11.5
Queue Length 50th (ft)	203	165	406	241
Queue Length 95th (ft)	#316	#319	472	282
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	873	388	3964	3964
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.93	0.83	0.91	0.70

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	746	345	0	3451	2660	0
Future Volume (veh/h)	746	345	0	3451	2660	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1772	1870	0	1870	1870	0
Adj Flow Rate, veh/h	777	359	0	3595	2771	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	877	412	0	4029	4029	0
Arrive On Green	0.26	0.26	0.00	0.63	0.63	0.00
Sat Flow, veh/h	3375	1585	0	6958	6958	0
Grp Volume(v), veh/h	777	359	0	3595	2771	0
Grp Sat Flow(s),veh/h/ln	1688	1585	0	1609	1609	0
Q Serve(g_s), s	17.5	17.1	0.0	37.4	22.3	0.0
Cycle Q Clear(g_c), s	17.5	17.1	0.0	37.4	22.3	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	877	412	0	4029	4029	0
V/C Ratio(X)	0.89	0.87	0.00	0.89	0.69	0.00
Avail Cap(c_a), veh/h	919	432	0	4035	4035	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.1	28.0	0.0	12.5	9.7	0.0
Incr Delay (d2), s/veh	10.1	16.9	0.0	2.9	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	8.1	0.0	11.7	6.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	38.2	44.9	0.0	15.4	10.2	0.0
LnGrp LOS	D	D	A	B	B	A
Approach Vol, veh/h	1136			3595	2771	
Approach Delay, s/veh	40.3			15.4	10.2	
Approach LOS	D			B	B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		53.9		25.0		53.9
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		49.5		21.5		49.5
Max Q Clear Time (g_c+I1), s		39.4		19.5		24.3
Green Ext Time (p_c), s		10.1		1.0		22.7

Intersection Summary		
HCM 6th Ctrl Delay	17.2	
HCM 6th LOS	B	

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1700	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3072	1583	3072	6408	6408	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3072	1583	3072	6408	6408	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		1				28
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	718	283	456	1701	1435	847
Future Volume (vph)	718	283	456	1701	1435	847
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	740	292	470	1754	1479	873
Shared Lane Traffic (%)						
Lane Group Flow (vph)	740	292	470	1754	1479	873

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	718	283	456	1701	1435	847
Future Volume (vph)	718	283	456	1701	1435	847
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	22.5	14.9	14.9	37.5	22.6	22.5
Total Split (%)	37.5%	24.8%	24.8%	62.5%	37.7%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	17.6	32.5	10.4	33.0	18.1	40.2
Actuated g/C Ratio	0.30	0.55	0.17	0.55	0.30	0.67
v/c Ratio	0.82	0.34	0.88	0.49	0.76	0.81
Control Delay	28.7	8.9	44.9	8.8	21.9	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.7	8.9	44.9	8.8	21.9	14.9
LOS	C	A	D	A	C	B
Approach Delay	23.1			16.4	19.3	
Approach LOS	C			B	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 59.6	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 18.9	Intersection LOS: B
Intersection Capacity Utilization 74.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	740	292	470	1754	1479	873
v/c Ratio	0.82	0.34	0.88	0.49	0.76	0.81
Control Delay	28.7	8.9	44.9	8.8	21.9	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.7	8.9	44.9	8.8	21.9	14.9
Queue Length 50th (ft)	125	52	86	102	139	173
Queue Length 95th (ft)	#207	95	#162	128	177	#452
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	927	863	536	3548	1946	1087
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.34	0.88	0.49	0.76	0.80

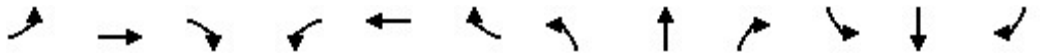
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	718	283	456	1701	1435	847
Future Volume (veh/h)	718	283	456	1701	1435	847
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1870	1673	1870	1870	1870
Adj Flow Rate, veh/h	740	292	470	1754	1479	873
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	870	728	550	3632	1992	937
Arrive On Green	0.28	0.28	0.18	0.56	0.31	0.31
Sat Flow, veh/h	3092	1585	3092	6696	6696	1585
Grp Volume(v), veh/h	740	292	470	1754	1479	873
Grp Sat Flow(s),veh/h/ln	1546	1585	1546	1609	1609	1585
Q Serve(g_s), s	13.2	7.1	8.6	9.5	12.0	18.1
Cycle Q Clear(g_c), s	13.2	7.1	8.6	9.5	12.0	18.1
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	870	728	550	3632	1992	937
V/C Ratio(X)	0.85	0.40	0.85	0.48	0.74	0.93
Avail Cap(c_a), veh/h	952	770	550	3632	1992	937
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	10.5	23.3	7.6	18.1	8.6
Incr Delay (d2), s/veh	6.9	0.4	12.5	0.1	1.5	15.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	7.4	3.8	2.5	4.2	15.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.8	10.8	35.7	7.7	19.6	24.1
LnGrp LOS	C	B	D	A	B	C
Approach Vol, veh/h	1032			2224	2352	
Approach Delay, s/veh	22.2			13.6	21.3	
Approach LOS	C			B	C	

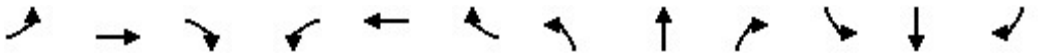
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		37.5		21.0	14.9	22.6
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		33.0		18.0	10.4	18.1
Max Q Clear Time (g_c+I1), s		11.5		15.2	10.6	20.1
Green Ext Time (p_c), s		13.8		1.2	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	18.4
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	295		235	360		185	180		0
Storage Lanes	2		0	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt		0.964				0.850			0.850		0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	4902	0	3072	3539	1583	3072	5085	1583	3072	6344	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	4902	0	3072	3539	1583	3072	5085	1583	3072	6344	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		75				260			268		15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1151			2626			1045			955	
Travel Time (s)		26.2			59.7			23.8			21.7	

Intersection Summary	
Area Type:	Other



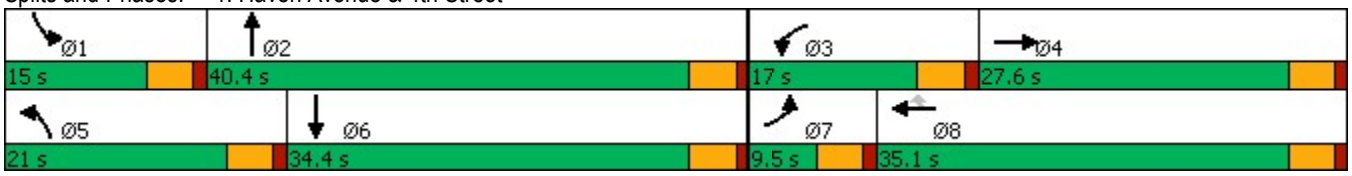
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	73	787	250	371	748	266	306	1607	521	276	1562	111
Future Volume (vph)	73	787	250	371	748	266	306	1607	521	276	1562	111
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	78	837	266	395	796	283	326	1710	554	294	1662	118
Shared Lane Traffic (%)												
Lane Group Flow (vph)	78	1103	0	395	796	283	326	1710	554	294	1780	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	73	787	371	748	266	306	1607	521	276	1562
Future Volume (vph)	73	787	371	748	266	306	1607	521	276	1562
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases					8			Free		
Detector Phase	7	4	3	8	8	5	2		1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5
Total Split (s)	9.5	27.6	17.0	35.1	35.1	21.0	40.4		15.0	34.4
Total Split (%)	9.5%	27.6%	17.0%	35.1%	35.1%	21.0%	40.4%		15.0%	34.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	5.0	23.1	12.5	32.5	32.5	14.8	35.9	100.0	10.5	31.6
Actuated g/C Ratio	0.05	0.23	0.12	0.32	0.32	0.15	0.36	1.00	0.10	0.32
v/c Ratio	0.51	0.93	1.03	0.69	0.41	0.72	0.94	0.35	0.91	0.88
Control Delay	58.3	49.2	97.6	33.8	6.5	49.7	42.1	0.6	77.7	39.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.3	49.2	97.6	33.8	6.5	49.7	42.1	0.6	77.7	39.1
LOS	E	D	F	C	A	D	D	A	E	D
Approach Delay		49.8		45.7			34.2			44.6
Approach LOS		D		D			C			D

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.03	
Intersection Signal Delay: 42.0	Intersection LOS: D
Intersection Capacity Utilization 87.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Haven Avenue & 4th Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	78	1103	395	796	283	326	1710	554	294	1780
v/c Ratio	0.51	0.93	1.03	0.69	0.41	0.72	0.94	0.35	0.91	0.88
Control Delay	58.3	49.2	97.6	33.8	6.5	49.7	42.1	0.6	77.7	39.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.3	49.2	97.6	33.8	6.5	49.7	42.1	0.6	77.7	39.1
Queue Length 50th (ft)	25	238	~139	238	10	102	380	0	97	313
Queue Length 95th (ft)	50	#324	#234	308	71	147	#485	0	#175	#394
Internal Link Dist (ft)		1071		2546			965			875
Turn Bay Length (ft)	170		295		235	360		185	180	
Base Capacity (vph)	153	1190	384	1149	689	506	1825	1583	322	2012
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.93	1.03	0.69	0.41	0.64	0.94	0.35	0.91	0.88

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

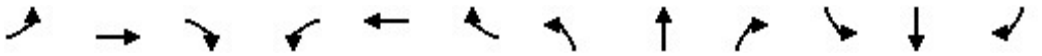
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	787	250	371	748	266	306	1607	521	276	1562	111
Future Volume (veh/h)	73	787	250	371	748	266	306	1607	521	276	1562	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	78	837	266	395	796	283	326	1710	0	294	1662	118
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	137	888	280	386	1108	494	394	1833		325	2079	148
Arrive On Green	0.04	0.23	0.23	0.13	0.31	0.31	0.13	0.36	0.00	0.10	0.34	0.34
Sat Flow, veh/h	3092	3842	1214	3092	3554	1585	3092	5106	1585	3092	6178	439
Grp Volume(v), veh/h	78	741	362	395	796	283	326	1710	0	294	1298	482
Grp Sat Flow(s),veh/h/ln	1546	1702	1652	1546	1777	1585	1546	1702	1585	1546	1609	1791
Q Serve(g_s), s	2.5	21.4	21.6	12.5	19.9	15.0	10.3	32.3	0.0	9.4	24.4	24.4
Cycle Q Clear(g_c), s	2.5	21.4	21.6	12.5	19.9	15.0	10.3	32.3	0.0	9.4	24.4	24.4
Prop In Lane	1.00		0.73	1.00		1.00	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	137	786	382	386	1108	494	394	1833		325	1624	603
V/C Ratio(X)	0.57	0.94	0.95	1.02	0.72	0.57	0.83	0.93		0.91	0.80	0.80
Avail Cap(c_a), veh/h	155	786	382	386	1108	494	510	1833		325	1624	603
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.9	37.8	37.9	43.8	30.5	28.8	42.6	30.9	0.0	44.3	30.1	30.1
Incr Delay (d2), s/veh	3.8	19.4	33.0	51.5	2.3	1.6	8.5	10.2	0.0	27.5	4.2	10.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	10.9	12.1	7.5	8.7	5.8	4.4	14.5	0.0	4.8	9.8	12.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.7	57.2	70.9	95.2	32.8	30.4	51.1	41.1	0.0	71.8	34.3	40.8
LnGrp LOS	D	E	E	F	C	C	D	D		E	C	D
Approach Vol, veh/h		1181			1474			2036	A		2074	
Approach Delay, s/veh		61.0			49.1			42.7			41.1	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	40.4	17.0	27.6	17.2	38.2	8.9	35.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	35.9	12.5	23.1	16.5	29.9	5.0	30.6
Max Q Clear Time (g_c+I1), s	11.4	34.3	14.5	23.6	12.3	26.4	4.5	21.9
Green Ext Time (p_c), s	0.0	1.4	0.0	0.0	0.5	2.9	0.0	4.2

Intersection Summary	
HCM 6th Ctrl Delay	46.8
HCM 6th LOS	D

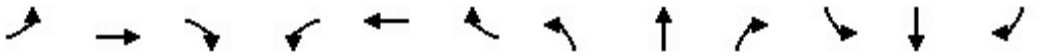
Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	130		145	165		165	50		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.86	0.86	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.994				0.850			0.850		0.850	
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1765	6369	0	1676	5085	1583	1676	1863	1583	1676	3008	0
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1765	6369	0	1676	5085	1583	1676	1863	1583	1676	3008	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11				172			200		264	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2626			442			349			438	
Travel Time (s)		59.7			10.0			7.9			10.0	

Intersection Summary	
Area Type:	Other



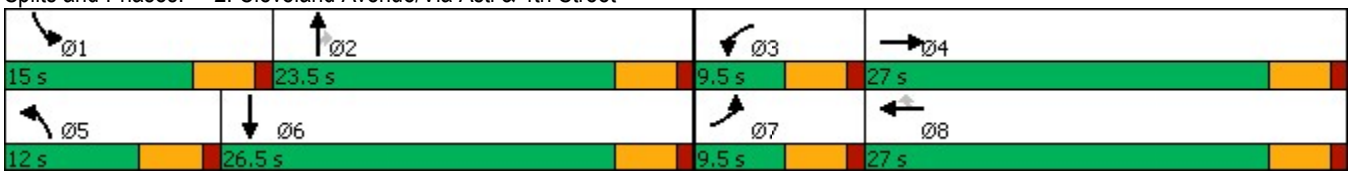
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	1639	66	4	1307	177	59	0	6	174	0	1
Future Volume (vph)	0	1639	66	4	1307	177	59	0	6	174	0	1
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1690	68	4	1347	182	61	0	6	179	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1758	0	4	1347	182	61	0	6	179	1	0

Intersection Summary

Lane Group	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT	Ø7
Lane Configurations									
Traffic Volume (vph)	1639	4	1307	177	59	6	174	0	
Future Volume (vph)	1639	4	1307	177	59	6	174	0	
Turn Type	NA	Prot	NA	Perm	Prot	Perm	Prot	NA	
Protected Phases	4	3	8		5		1	6	7
Permitted Phases				8		2			
Detector Phase	4	3	8	8	5	2	1	6	
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5	9.5
Total Split (s)	27.0	9.5	27.0	27.0	12.0	23.5	15.0	26.5	9.5
Total Split (%)	36.0%	12.7%	36.0%	36.0%	16.0%	31.3%	20.0%	35.3%	13%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min	None
Act Effct Green (s)	22.6	5.0	24.3	24.3	6.8	5.5	9.9	13.0	
Actuated g/C Ratio	0.42	0.09	0.46	0.46	0.13	0.10	0.19	0.24	
v/c Ratio	0.65	0.03	0.58	0.22	0.29	0.02	0.57	0.00	
Control Delay	14.1	24.5	11.9	2.7	25.9	0.2	29.5	0.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	14.1	24.5	11.9	2.7	25.9	0.2	29.5	0.0	
LOS	B	C	B	A	C	A	C	A	
Approach Delay	14.1		10.9					29.3	
Approach LOS	B		B					C	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 53.3	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 13.6	Intersection LOS: B
Intersection Capacity Utilization 50.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Cleveland Avenue/Via Asti & 4th Street



Lane Group	EBT	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	1758	4	1347	182	61	6	179	1
v/c Ratio	0.65	0.03	0.58	0.22	0.29	0.02	0.57	0.00
Control Delay	14.1	24.5	11.9	2.7	25.9	0.2	29.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	24.5	11.9	2.7	25.9	0.2	29.5	0.0
Queue Length 50th (ft)	114	1	109	2	17	0	49	0
Queue Length 95th (ft)	201	9	143	26	52	0	#135	0
Internal Link Dist (ft)	2546		362					358
Turn Bay Length (ft)		130		145	165	165	50	
Base Capacity (vph)	2709	158	2315	814	236	695	332	1402
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.03	0.58	0.22	0.26	0.01	0.54	0.00

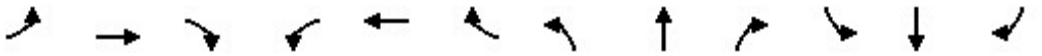
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1639	66	4	1307	177	59	0	6	174	0	1
Future Volume (veh/h)	0	1639	66	4	1307	177	59	0	6	174	0	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1870	1870	1772	1870	1870	1772	1870	1870	1772	1870	1870
Adj Flow Rate, veh/h	0	1690	68	4	1347	182	61	0	6	179	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	3	2561	103	9	2533	786	96	187	159	225	314	280
Arrive On Green	0.00	0.40	0.40	0.01	0.50	0.50	0.06	0.00	0.10	0.13	0.00	0.18
Sat Flow, veh/h	1688	6392	257	1688	5106	1585	1688	1870	1585	1688	1777	1585
Grp Volume(v), veh/h	0	1276	482	4	1347	182	61	0	6	179	0	1
Grp Sat Flow(s),veh/h/ln	1688	1609	1824	1688	1702	1585	1688	1870	1585	1688	1777	1585
Q Serve(g_s), s	0.0	10.8	10.8	0.1	9.0	3.3	1.8	0.0	0.2	5.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	10.8	10.8	0.1	9.0	3.3	1.8	0.0	0.2	5.1	0.0	0.0
Prop In Lane	1.00		0.14	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	3	1933	731	9	2533	786	96	187	159	225	314	280
V/C Ratio(X)	0.00	0.66	0.66	0.44	0.53	0.23	0.63	0.00	0.04	0.79	0.00	0.00
Avail Cap(c_a), veh/h	169	2173	822	169	2533	786	253	711	603	355	782	698
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.2	12.2	24.8	8.6	7.2	23.0	0.0	20.3	21.0	0.0	17.0
Incr Delay (d2), s/veh	0.0	0.6	1.7	29.8	0.2	0.1	6.7	0.0	0.1	6.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.3	3.9	0.1	2.6	0.9	0.8	0.0	0.1	2.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	12.8	13.9	54.6	8.8	7.3	29.7	0.0	20.4	27.4	0.0	17.0
LnGrp LOS	A	B	B	D	A	A	C	A	C	C	A	B
Approach Vol, veh/h		1758			1533			67			180	
Approach Delay, s/veh		13.1			8.8			28.9			27.3	
Approach LOS		B			A			C			C	

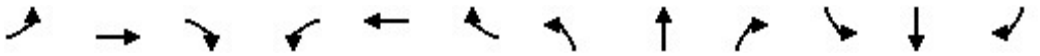
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.2	9.5	4.8	24.5	7.4	13.3	0.0	29.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	19.0	5.0	22.5	7.5	22.0	5.0	22.5
Max Q Clear Time (g_c+I1), s	7.1	2.2	2.1	12.8	3.8	2.0	0.0	11.0
Green Ext Time (p_c), s	0.1	0.0	0.0	7.3	0.0	0.0	0.0	7.3

Intersection Summary	
HCM 6th Ctrl Delay	12.3
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1800	1900	1900	1800	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	125		0	115		115	0		110
Storage Lanes	2		0	1		0	1		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.86	0.86	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.992				0.850			0.850
Flt Protected	0.950			0.950			0.950				0.953	
Satd. Flow (prot)	3072	6401	0	1676	5045	0	1676	1863	1583	0	1775	1583
Flt Permitted	0.950			0.950			0.712				0.729	
Satd. Flow (perm)	3072	6401	0	1676	5045	0	1256	1863	1583	0	1358	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			15				218			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			508			382			458	
Travel Time (s)		10.0			11.5			8.7			10.4	

Intersection Summary	
Area Type:	Other



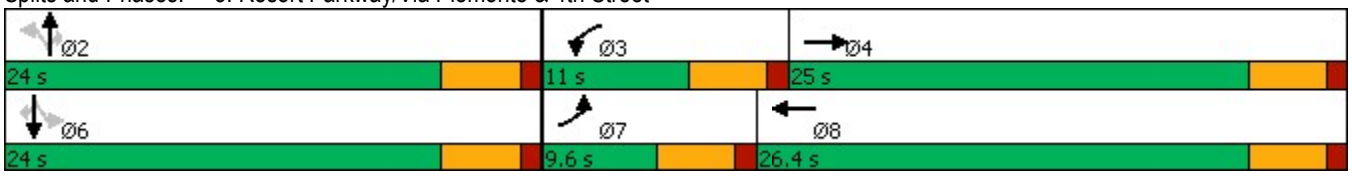
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	16	1611	12	67	1238	66	33	0	41	66	1	22
Future Volume (vph)	16	1611	12	67	1238	66	33	0	41	66	1	22
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	16	1661	12	69	1276	68	34	0	42	68	1	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	1673	0	69	1344	0	34	0	42	0	69	23

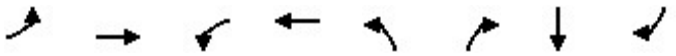
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	16	1611	67	1238	33	41	66	1	22
Future Volume (vph)	16	1611	67	1238	33	41	66	1	22
Turn Type	Prot	NA	Prot	NA	Perm	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8				6	
Permitted Phases					2	2	6		6
Detector Phase	7	4	3	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.6	25.0	11.0	26.4	24.0	24.0	24.0	24.0	24.0
Total Split (%)	16.0%	41.7%	18.3%	44.0%	40.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min
Act Effct Green (s)	5.3	20.5	6.4	24.6	7.7	7.7		7.7	7.7
Actuated g/C Ratio	0.12	0.47	0.15	0.57	0.18	0.18		0.18	0.18
v/c Ratio	0.04	0.55	0.28	0.47	0.15	0.09		0.29	0.06
Control Delay	20.7	10.3	22.5	6.9	18.7	0.4		20.6	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	20.7	10.3	22.5	6.9	18.7	0.4		20.6	0.3
LOS	C	B	C	A	B	A		C	A
Approach Delay		10.4		7.6				15.5	
Approach LOS		B		A				B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 43.3	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 9.3	Intersection LOS: A
Intersection Capacity Utilization 51.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Resort Parkway/Via Piemonte & 4th Street





Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBT	SBR
Lane Group Flow (vph)	16	1673	69	1344	34	42	69	23
v/c Ratio	0.04	0.55	0.28	0.47	0.15	0.09	0.29	0.06
Control Delay	20.7	10.3	22.5	6.9	18.7	0.4	20.6	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.7	10.3	22.5	6.9	18.7	0.4	20.6	0.3
Queue Length 50th (ft)	2	98	18	48	8	0	17	0
Queue Length 95th (ft)	9	145	49	145	27	0	45	0
Internal Link Dist (ft)		362		428			378	
Turn Bay Length (ft)	220		125		115	115		110
Base Capacity (vph)	375	3144	260	3050	586	855	634	797
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.53	0.27	0.44	0.06	0.05	0.11	0.03

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	1611	12	67	1238	66	33	0	41	66	1	22
Future Volume (veh/h)	16	1611	12	67	1238	66	33	0	41	66	1	22
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1772	1870	1870	1772	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	16	1661	12	69	1276	68	34	0	42	68	1	23
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	63	2963	21	115	2451	131	301	246	208	364	4	208
Arrive On Green	0.02	0.45	0.45	0.07	0.49	0.49	0.13	0.00	0.13	0.13	0.13	0.13
Sat Flow, veh/h	3092	6639	48	1688	4962	264	1314	1870	1585	1342	31	1585
Grp Volume(v), veh/h	16	1207	466	69	875	469	34	0	42	69	0	23
Grp Sat Flow(s),veh/h/ln	1546	1609	1862	1688	1702	1823	1314	1870	1585	1373	0	1585
Q Serve(g_s), s	0.2	7.0	7.0	1.5	6.7	6.7	0.9	0.0	0.9	1.7	0.0	0.5
Cycle Q Clear(g_c), s	0.2	7.0	7.0	1.5	6.7	6.7	2.7	0.0	0.9	1.7	0.0	0.5
Prop In Lane	1.00		0.03	1.00		0.15	1.00		1.00	0.99		1.00
Lane Grp Cap(c), veh/h	63	2154	831	115	1681	900	301	246	208	368	0	208
V/C Ratio(X)	0.25	0.56	0.56	0.60	0.52	0.52	0.11	0.00	0.20	0.19	0.00	0.11
Avail Cap(c_a), veh/h	414	2597	1002	288	1957	1048	802	957	811	889	0	811
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.4	7.8	7.8	17.2	6.6	6.6	16.4	0.0	14.8	15.1	0.0	14.6
Incr Delay (d2), s/veh	2.1	0.2	0.6	5.0	0.3	0.5	0.2	0.0	0.5	0.2	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.6	2.0	0.7	1.5	1.7	0.3	0.0	0.3	0.5	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.4	8.0	8.4	22.2	6.8	7.0	16.5	0.0	15.2	15.4	0.0	14.8
LnGrp LOS	C	A	A	C	A	A	B	A	B	B	A	B
Approach Vol, veh/h		1689			1413			76			92	
Approach Delay, s/veh		8.2			7.6			15.8			15.2	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	7.1	21.5		9.5	5.3	23.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		19.5	6.5	20.5		19.5	5.1	21.9				
Max Q Clear Time (g_c+I1), s		4.7	3.5	9.0		3.7	2.2	8.7				
Green Ext Time (p_c), s		0.1	0.0	8.0		0.3	0.0	7.4				

Intersection Summary	
HCM 6th Ctrl Delay	8.4
HCM 6th LOS	A

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.991					0.865
Flt Protected						
Satd. Flow (prot)	5040	0	0	5085	0	1611
Flt Permitted						
Satd. Flow (perm)	5040	0	0	5085	0	1611
Link Speed (mph)	30			30	30	
Link Distance (ft)	508			1697	354	
Travel Time (s)	11.5			38.6	8.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	1613	105	0	1400	0	51
Future Volume (vph)	1613	105	0	1400	0	51
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1698	111	0	1474	0	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1809	0	0	1474	0	54

Intersection Summary

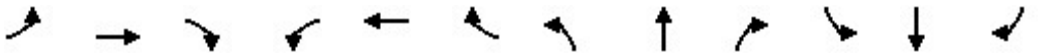
Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1613	105	0	1400	0	51
Future Vol, veh/h	1613	105	0	1400	0	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1698	111	0	1474	0	54

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	905
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	240
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	240
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

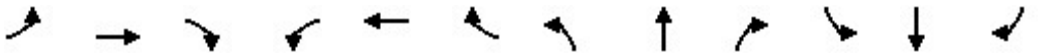
Approach	EB	WB	NB
HCM Control Delay, s	0	0	24.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	240	-	-	-
HCM Lane V/C Ratio	0.224	-	-	-
HCM Control Delay (s)	24.3	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.8	-	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	230		190	405		440	330		320	310		0
Storage Lanes	2		1	2		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.86	1.00	0.97	0.86	0.86
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.977	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	5085	1583	3072	5085	1583	3072	6408	1583	3072	6260	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	5085	1583	3072	5085	1583	3072	6408	1583	3072	6260	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			245			294			95		37	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1697			3633			1030			781	
Travel Time (s)		38.6			82.6			23.4			17.8	

Intersection Summary	
Area Type:	Other



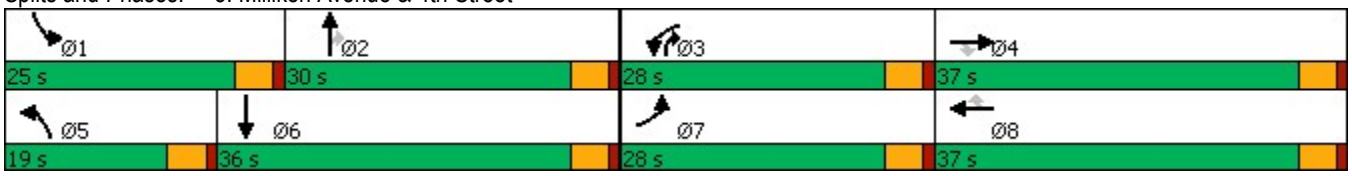
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	383	1344	403	754	987	389	328	1224	525	546	1185	213
Future Volume (vph)	383	1344	403	754	987	389	328	1224	525	546	1185	213
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	403	1415	424	794	1039	409	345	1288	553	575	1247	224
Shared Lane Traffic (%)												
Lane Group Flow (vph)	403	1415	424	794	1039	409	345	1288	553	575	1471	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	383	1344	403	754	987	389	328	1224	525	546	1185
Future Volume (vph)	383	1344	403	754	987	389	328	1224	525	546	1185
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5
Total Split (s)	28.0	37.0	37.0	28.0	37.0	37.0	19.0	30.0	28.0	25.0	36.0
Total Split (%)	23.3%	30.8%	30.8%	23.3%	30.8%	30.8%	15.8%	25.0%	23.3%	20.8%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	20.3	32.5	32.5	23.5	35.7	35.7	14.5	25.5	53.5	20.5	31.5
Actuated g/C Ratio	0.17	0.27	0.27	0.20	0.30	0.30	0.12	0.21	0.45	0.17	0.26
v/c Ratio	0.78	1.03	0.70	1.32	0.69	0.60	0.93	0.95	0.73	1.10	0.88
Control Delay	58.2	74.7	23.0	194.6	40.6	14.7	84.5	61.3	29.0	114.8	48.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.2	74.7	23.0	194.6	40.6	14.7	84.5	61.3	29.0	114.8	48.6
LOS	E	E	C	F	D	B	F	E	C	F	D
Approach Delay		61.9			90.4			56.8			67.2
Approach LOS		E			F			E			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.32	
Intersection Signal Delay: 69.2	Intersection LOS: E
Intersection Capacity Utilization 100.2%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 5: Milliken Avenue & 4th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	403	1415	424	794	1039	409	345	1288	553	575	1471
v/c Ratio	0.78	1.03	0.70	1.32	0.69	0.60	0.93	0.95	0.73	1.10	0.88
Control Delay	58.2	74.7	23.0	194.6	40.6	14.7	84.5	61.3	29.0	114.8	48.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.2	74.7	23.0	194.6	40.6	14.7	84.5	61.3	29.0	114.8	48.6
Queue Length 50th (ft)	154	~428	125	~409	262	69	138	288	290	~259	311
Queue Length 95th (ft)	205	#525	248	#533	324	185	#228	#360	435	#373	359
Internal Link Dist (ft)		1617			3553			950			701
Turn Bay Length (ft)	230		190	405		440	330		320	310	
Base Capacity (vph)	601	1377	607	601	1512	677	371	1361	758	524	1670
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	1.03	0.70	1.32	0.69	0.60	0.93	0.95	0.73	1.10	0.88

Intersection Summary

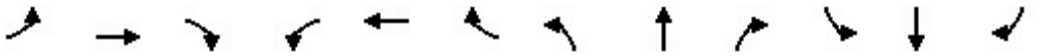
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	383	1344	403	754	987	389	328	1224	525	546	1185	213
Future Volume (veh/h)	383	1344	403	754	987	389	328	1224	525	546	1185	213
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	403	1415	424	794	1039	409	345	1288	553	575	1247	224
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	466	1383	429	606	1613	501	374	1367	647	528	1452	259
Arrive On Green	0.15	0.27	0.27	0.20	0.32	0.32	0.12	0.21	0.21	0.17	0.26	0.26
Sat Flow, veh/h	3092	5106	1585	3092	5106	1585	3092	6434	1585	3092	5530	988
Grp Volume(v), veh/h	403	1415	424	794	1039	409	345	1288	553	575	1087	384
Grp Sat Flow(s),veh/h/ln	1546	1702	1585	1546	1702	1585	1546	1609	1585	1546	1609	1692
Q Serve(g_s), s	15.3	32.5	32.0	23.5	21.0	28.5	13.3	23.7	25.5	20.5	25.7	25.9
Cycle Q Clear(g_c), s	15.3	32.5	32.0	23.5	21.0	28.5	13.3	23.7	25.5	20.5	25.7	25.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.58
Lane Grp Cap(c), veh/h	466	1383	429	606	1613	501	374	1367	647	528	1267	444
V/C Ratio(X)	0.86	1.02	0.99	1.31	0.64	0.82	0.92	0.94	0.85	1.09	0.86	0.86
Avail Cap(c_a), veh/h	606	1383	429	606	1613	501	374	1367	647	528	1267	444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.8	43.8	43.6	48.3	35.2	37.8	52.2	46.5	32.3	49.8	42.1	42.2
Incr Delay (d2), s/veh	10.1	30.3	40.1	151.7	0.9	10.2	28.1	13.0	10.8	65.4	6.1	16.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	17.4	17.2	21.8	8.8	12.4	6.6	10.6	16.2	12.7	10.9	12.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.9	74.0	83.6	199.9	36.1	48.0	80.3	59.5	43.1	115.1	48.2	58.2
LnGrp LOS	E	F	F	F	D	D	F	E	D	F	D	E
Approach Vol, veh/h		2242			2242			2186			2046	
Approach Delay, s/veh		73.3			96.3			58.6			68.9	
Approach LOS		E			F			E			E	

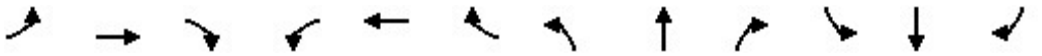
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.0	30.0	28.0	37.0	19.0	36.0	22.6	42.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	20.5	25.5	23.5	32.5	14.5	31.5	23.5	32.5
Max Q Clear Time (g_c+I1), s	22.5	27.5	25.5	34.5	15.3	27.9	17.3	30.5
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	2.7	0.8	1.5

Intersection Summary	
HCM 6th Ctrl Delay	74.5
HCM 6th LOS	E



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1800	1900	1900	1800	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	665		240	260		110	245		275	140		140
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.946	0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	5085	1583	3072	5085	1583	1676	3539	1583	1676	3207	1441
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	5085	1583	3072	5085	1583	1676	3539	1583	1676	3207	1441
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			128			224			354		85	397
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3633			915			558			544	
Travel Time (s)		82.6			20.8			12.7			12.4	

Intersection Summary	
Area Type:	Other



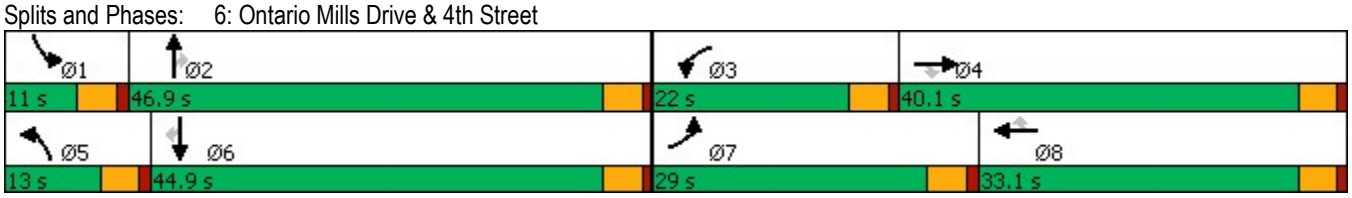
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1023	1556	219	574	1257	589	255	446	683	110	884	1122
Future Volume (vph)	1023	1556	219	574	1257	589	255	446	683	110	884	1122
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1066	1621	228	598	1309	614	266	465	711	115	921	1169
Shared Lane Traffic (%)												44%
Lane Group Flow (vph)	1066	1621	228	598	1309	614	266	465	711	115	1435	655

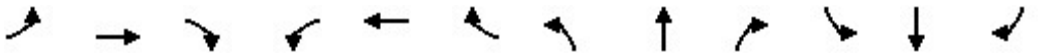
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1023	1556	219	574	1257	589	255	446	683	110	884	1122
Future Volume (vph)	1023	1556	219	574	1257	589	255	446	683	110	884	1122
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	29.0	40.1	40.1	22.0	33.1	33.1	13.0	46.9	46.9	11.0	44.9	44.9
Total Split (%)	24.2%	33.4%	33.4%	18.3%	27.6%	27.6%	10.8%	39.1%	39.1%	9.2%	37.4%	37.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	24.5	35.6	35.6	17.5	28.6	28.6	8.5	42.4	42.4	6.5	40.4	40.4
Actuated g/C Ratio	0.20	0.30	0.30	0.15	0.24	0.24	0.07	0.35	0.35	0.05	0.34	0.34
v/c Ratio	1.70	1.07	0.41	1.33	1.08	1.12	2.25	0.37	0.90	1.28	1.26	0.88
Control Delay	352.9	86.7	16.9	205.3	94.0	104.2	616.4	30.0	34.4	231.7	158.6	28.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	352.9	86.7	16.9	205.3	94.0	104.2	616.4	30.0	34.4	231.7	158.6	28.6
LOS	F	F	B	F	F	F	F	C	C	F	F	C
Approach Delay		178.6			122.9			140.3			123.8	
Approach LOS		F			F			F			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 2.25	
Intersection Signal Delay: 143.7	Intersection LOS: F
Intersection Capacity Utilization 123.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 6: Ontario Mills Drive & 4th Street



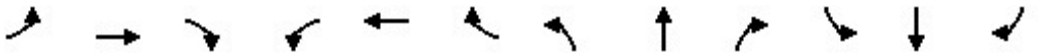


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1066	1621	228	598	1309	614	266	465	711	115	1435	655
v/c Ratio	1.70	1.07	0.41	1.33	1.08	1.12	2.25	0.37	0.90	1.28	1.26	0.88
Control Delay	352.9	86.7	16.9	205.3	94.0	104.2	616.4	30.0	34.4	231.7	158.6	28.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	352.9	86.7	16.9	205.3	94.0	104.2	616.4	30.0	34.4	231.7	158.6	28.6
Queue Length 50th (ft)	~625	~511	58	~310	~415	~408	~333	140	296	~112	~746	232
Queue Length 95th (ft)	#756	#609	131	#425	#511	#636	#504	186	#556	#235	#893	#508
Internal Link Dist (ft)		3553			835			478			464	
Turn Bay Length (ft)	665		240	260		110	245		275	140		140
Base Capacity (vph)	627	1508	559	448	1211	547	118	1250	788	90	1136	748
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.70	1.07	0.41	1.33	1.08	1.12	2.25	0.37	0.90	1.28	1.26	0.88

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



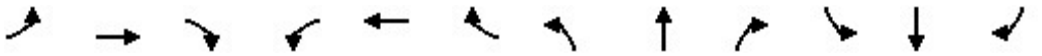
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1023	1556	219	574	1257	589	255	446	683	110	884	1122
Future Volume (veh/h)	1023	1556	219	574	1257	589	255	446	683	110	884	1122
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1772	1870	1870	1772	1870	1870
Adj Flow Rate, veh/h	1066	1621	228	598	1309	614	266	465	711	115	921	1169
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	631	1515	470	451	1217	378	120	1256	560	91	630	1067
Arrive On Green	0.20	0.30	0.30	0.15	0.24	0.24	0.07	0.35	0.35	0.05	0.34	0.34
Sat Flow, veh/h	3092	5106	1585	3092	5106	1585	1688	3554	1585	1688	1870	3170
Grp Volume(v), veh/h	1066	1621	228	598	1309	614	266	465	711	115	921	1169
Grp Sat Flow(s),veh/h/ln	1546	1702	1585	1546	1702	1585	1688	1777	1585	1688	1870	1585
Q Serve(g_s), s	24.5	35.6	14.2	17.5	28.6	28.6	8.5	11.7	42.4	6.5	40.4	40.4
Cycle Q Clear(g_c), s	24.5	35.6	14.2	17.5	28.6	28.6	8.5	11.7	42.4	6.5	40.4	40.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	631	1515	470	451	1217	378	120	1256	560	91	630	1067
V/C Ratio(X)	1.69	1.07	0.48	1.33	1.08	1.63	2.23	0.37	1.27	1.26	1.46	1.10
Avail Cap(c_a), veh/h	631	1515	470	451	1217	378	120	1256	560	91	630	1067
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.8	42.2	34.7	51.2	45.7	45.7	55.7	28.9	38.8	56.8	39.8	39.8
Incr Delay (d2), s/veh	316.7	44.4	0.8	161.5	48.7	293.3	577.5	0.2	134.9	178.6	216.9	57.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	37.1	21.0	5.6	16.9	17.5	41.9	22.8	5.0	37.1	7.3	56.2	24.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	364.5	86.6	35.4	212.8	94.4	339.0	633.2	29.1	173.7	235.3	256.7	97.2
LnGrp LOS	F	F	D	F	F	F	F	C	F	F	F	F
Approach Vol, veh/h		2915			2521			1442			2205	
Approach Delay, s/veh		184.2			182.1			211.8			171.0	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	46.9	22.0	40.1	13.0	44.9	29.0	33.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	42.4	17.5	35.6	8.5	40.4	24.5	28.6
Max Q Clear Time (g_c+I1), s	8.5	44.4	19.5	37.6	10.5	42.4	26.5	30.6
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	184.8
HCM 6th LOS	F

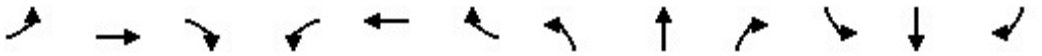
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		120	240		0	100		0	145		145
Storage Lanes	2		1	1		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850		0.982			0.939				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.987	
Satd. Flow (prot)	3072	5085	1583	1676	4994	0	1676	3323	0	1593	1747	2640
Flt Permitted	0.950			0.950			0.950			0.950	0.987	
Satd. Flow (perm)	3072	5085	1583	1676	4994	0	1676	3323	0	1593	1747	2640
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			138		18			70				298
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		915			1496			309			544	
Travel Time (s)		20.8			34.0			7.0			12.4	

Intersection Summary	
Area Type:	Other



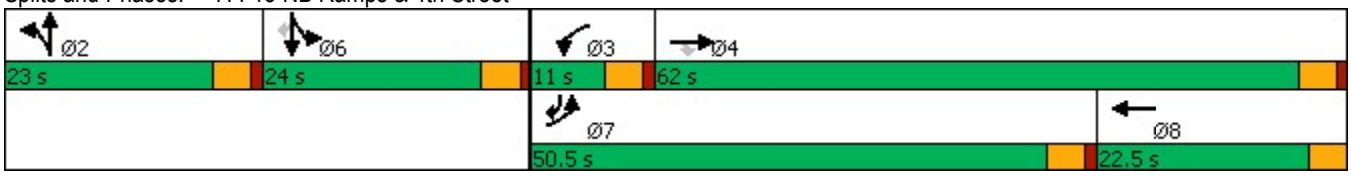
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1456	693	130	45	770	107	133	95	66	175	106	1588
Future Volume (vph)	1456	693	130	45	770	107	133	95	66	175	106	1588
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1549	737	138	48	819	114	141	101	70	186	113	1689
Shared Lane Traffic (%)										21%		
Lane Group Flow (vph)	1549	737	138	48	933	0	141	171	0	147	152	1689

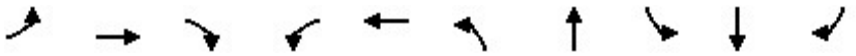
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	1456	693	130	45	770	133	95	175	106	1588
Future Volume (vph)	1456	693	130	45	770	133	95	175	106	1588
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	Split	NA	pm+ov
Protected Phases	7	4		3	8	2	2	6	6	7
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	2	2	6	6	7
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	9.5
Total Split (s)	50.5	62.0	62.0	11.0	22.5	23.0	23.0	24.0	24.0	50.5
Total Split (%)	42.1%	51.7%	51.7%	9.2%	18.8%	19.2%	19.2%	20.0%	20.0%	42.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	46.2	60.2	60.2	6.3	19.1	14.1	14.1	15.0	15.0	65.7
Actuated g/C Ratio	0.41	0.54	0.54	0.06	0.17	0.13	0.13	0.13	0.13	0.59
v/c Ratio	1.22	0.27	0.15	0.51	1.07	0.67	0.35	0.69	0.65	1.01
Control Delay	135.8	15.7	3.2	72.4	95.7	62.5	28.2	63.7	59.7	43.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	135.8	15.7	3.2	72.4	95.7	62.5	28.2	63.7	59.7	43.5
LOS	F	B	A	E	F	E	C	E	E	D
Approach Delay		91.7			94.6		43.7		46.2	
Approach LOS		F			F		D		D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 111.5	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.22	
Intersection Signal Delay: 73.7	Intersection LOS: E
Intersection Capacity Utilization 94.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 7: I-15 NB Ramps & 4th Street





Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1549	737	138	48	933	141	171	147	152	1689
v/c Ratio	1.22	0.27	0.15	0.51	1.07	0.67	0.35	0.69	0.65	1.01
Control Delay	135.8	15.7	3.2	72.4	95.7	62.5	28.2	63.7	59.7	43.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	135.8	15.7	3.2	72.4	95.7	62.5	28.2	63.7	59.7	43.5
Queue Length 50th (ft)	~713	106	0	34	~273	98	34	107	110	~609
Queue Length 95th (ft)	#935	153	34	#86	#402	171	70	185	189	#878
Internal Link Dist (ft)		835			1416		229		464	
Turn Bay Length (ft)	200		120	240		100		145		145
Base Capacity (vph)	1273	2746	918	98	869	279	612	279	306	1678
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.22	0.27	0.15	0.49	1.07	0.51	0.28	0.53	0.50	1.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1456	693	130	45	770	107	133	95	66	175	106	1588
Future Volume (veh/h)	1456	693	130	45	770	107	133	95	66	175	106	1588
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1772	1870	1870	1772	1870	1870	1772	1870	1772
Adj Flow Rate, veh/h	1549	737	138	48	819	114	141	101	70	150	164	1689
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1241	2712	842	60	752	104	179	220	141	287	318	1716
Arrive On Green	0.40	0.53	0.53	0.04	0.17	0.17	0.11	0.11	0.11	0.17	0.17	0.17
Sat Flow, veh/h	3092	5106	1585	1688	4534	627	1688	2076	1332	1688	1870	3003
Grp Volume(v), veh/h	1549	737	138	48	614	319	141	85	86	150	164	1689
Grp Sat Flow(s),veh/h/ln	1546	1702	1585	1688	1702	1757	1688	1777	1631	1688	1870	1502
Q Serve(g_s), s	46.0	9.1	5.1	3.2	19.0	19.0	9.3	5.2	5.7	9.3	9.1	19.5
Cycle Q Clear(g_c), s	46.0	9.1	5.1	3.2	19.0	19.0	9.3	5.2	5.7	9.3	9.1	19.5
Prop In Lane	1.00		1.00	1.00		0.36	1.00		0.82	1.00		1.00
Lane Grp Cap(c), veh/h	1241	2712	842	60	564	291	179	188	173	287	318	1716
V/C Ratio(X)	1.25	0.27	0.16	0.79	1.09	1.10	0.79	0.45	0.50	0.52	0.52	0.98
Avail Cap(c_a), veh/h	1241	2712	842	96	564	291	272	287	263	287	318	1716
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.3	14.7	13.8	54.8	47.8	47.8	50.0	48.1	48.4	43.3	43.3	24.1
Incr Delay (d2), s/veh	118.7	0.1	0.1	20.5	63.9	81.0	8.5	1.7	2.2	1.7	1.4	18.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	37.2	3.5	1.8	1.7	13.0	14.8	4.4	2.4	2.4	4.0	4.4	25.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	153.0	14.8	13.9	75.4	111.7	128.8	58.5	49.8	50.6	45.0	44.7	42.1
LnGrp LOS	F	B	B	E	F	F	E	D	D	D	D	D
Approach Vol, veh/h		2424			981			312			2003	
Approach Delay, s/veh		103.0			115.5			53.9			42.5	
Approach LOS		F			F			D			D	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	16.6	8.6	65.4	24.0	50.5	23.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	* 4.5
Max Green Setting (Gmax), s	18.5	6.5	57.5	19.5	46.0	* 19
Max Q Clear Time (g_c+I1), s	11.3	5.2	11.1	21.5	48.0	21.0
Green Ext Time (p_c), s	0.8	0.0	6.7	0.0	0.0	0.0

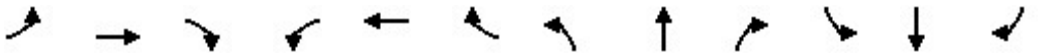
Intersection Summary	
HCM 6th Ctrl Delay	81.3
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

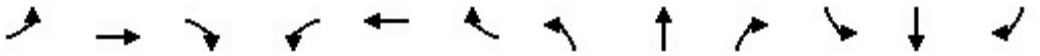
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

User approved changes to right turn type.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1600	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	190		50	225		190	240		295	130		225
Storage Lanes	2		0	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt		0.902				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3192	0	4202	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3192	0	4202	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		70				236			245			236
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		535			701			973			1045	
Travel Time (s)		12.2			15.9			22.1			23.8	

Intersection Summary	
Area Type:	Other



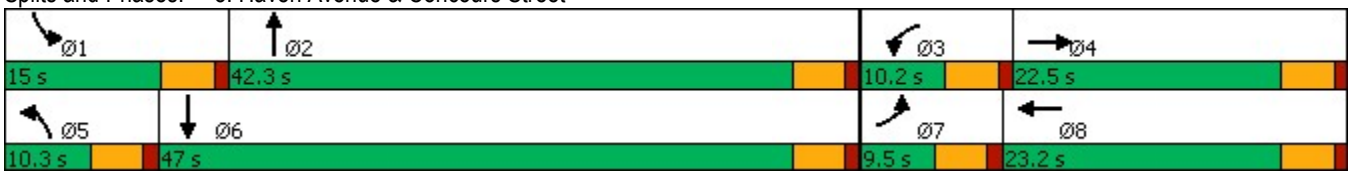
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	17	35	66	195	76	84	63	2234	310	274	2107	44
Future Volume (vph)	17	35	66	195	76	84	63	2234	310	274	2107	44
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	18	37	70	207	81	89	67	2377	330	291	2241	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	107	0	207	81	89	67	2377	330	291	2241	47

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	17	35	195	76	84	63	2234	310	274	2107	44
Future Volume (vph)	17	35	195	76	84	63	2234	310	274	2107	44
Turn Type	Prot	NA	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8		5	2		1	6	
Permitted Phases					Free			Free			Free
Detector Phase	7	4	3	8		5	2		1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	9.5	22.5	10.2	23.2		10.3	42.3		15.0	47.0	
Total Split (%)	10.6%	25.0%	11.3%	25.8%		11.4%	47.0%		16.7%	52.2%	
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	5.0	6.6	5.7	12.7	76.3	5.8	38.0	76.3	10.2	44.8	76.3
Actuated g/C Ratio	0.07	0.09	0.07	0.17	1.00	0.08	0.50	1.00	0.13	0.59	1.00
v/c Ratio	0.09	0.32	0.66	0.14	0.06	0.29	0.75	0.21	0.71	0.60	0.03
Control Delay	36.3	17.5	46.6	28.6	0.1	38.4	17.9	0.3	43.1	12.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	17.5	46.6	28.6	0.1	38.4	17.9	0.3	43.1	12.3	0.0
LOS	D	B	D	C	A	D	B	A	D	B	A
Approach Delay		20.2		31.8			16.3			15.6	
Approach LOS		C		C			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 76.3	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 17.0	Intersection LOS: B
Intersection Capacity Utilization 63.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 8: Haven Avenue & Concours Street



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	18	107	207	81	89	67	2377	330	291	2241	47
v/c Ratio	0.09	0.32	0.66	0.14	0.06	0.29	0.75	0.21	0.71	0.60	0.03
Control Delay	36.3	17.5	46.6	28.6	0.1	38.4	17.9	0.3	43.1	12.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	17.5	46.6	28.6	0.1	38.4	17.9	0.3	43.1	12.3	0.0
Queue Length 50th (ft)	4	8	35	16	0	16	263	0	71	207	0
Queue Length 95th (ft)	14	32	#68	40	0	36	329	0	#126	262	0
Internal Link Dist (ft)		455		621			893			965	
Turn Bay Length (ft)	190		225		190	240		295	130		225
Base Capacity (vph)	202	809	315	871	1583	234	3188	1583	424	3760	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.13	0.66	0.09	0.06	0.29	0.75	0.21	0.69	0.60	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

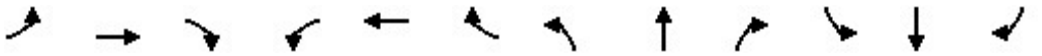
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	35	66	195	76	84	63	2234	310	274	2107	44
Future Volume (veh/h)	17	35	66	195	76	84	63	2234	310	274	2107	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1575	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	18	37	70	207	81	0	67	2377	0	291	2241	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	65	131	117	312	450		156	3144		373	3595	
Arrive On Green	0.02	0.07	0.07	0.07	0.13	0.00	0.05	0.49	0.00	0.12	0.56	0.00
Sat Flow, veh/h	3092	1777	1585	4230	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	18	37	70	207	81	0	67	2377	0	291	2241	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1410	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	0.4	1.5	3.2	3.5	1.5	0.0	1.6	22.2	0.0	6.8	17.5	0.0
Cycle Q Clear(g_c), s	0.4	1.5	3.2	3.5	1.5	0.0	1.6	22.2	0.0	6.8	17.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	65	131	117	312	450		156	3144		373	3595	
V/C Ratio(X)	0.28	0.28	0.60	0.66	0.18		0.43	0.76		0.78	0.62	
Avail Cap(c_a), veh/h	209	432	385	326	898		242	3285		439	3693	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.7	32.4	33.2	33.4	28.9	0.0	34.1	15.4	0.0	31.6	11.1	0.0
Incr Delay (d2), s/veh	2.3	1.2	4.8	4.7	0.2	0.0	1.9	1.0	0.0	7.5	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.7	1.3	1.3	0.6	0.0	0.6	7.4	0.0	2.8	5.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.0	33.6	38.0	38.1	29.1	0.0	36.0	16.3	0.0	39.1	11.4	0.0
LnGrp LOS	D	C	D	D	C		D	B		D	B	
Approach Vol, veh/h		125			288	A		2444	A		2532	A
Approach Delay, s/veh		36.7			35.6			16.9			14.6	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.4	40.7	10.0	10.0	8.2	45.9	6.0	13.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	37.8	5.7	18.0	5.8	42.5	5.0	18.7
Max Q Clear Time (g_c+I1), s	8.8	24.2	5.5	5.2	3.6	19.5	2.4	3.5
Green Ext Time (p_c), s	0.2	12.0	0.0	0.4	0.0	18.2	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	17.3
HCM 6th LOS	B

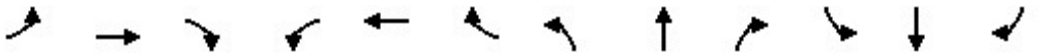
Notes

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1900	1900	1900	1900	1800	1900	1900	1800	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	170		0	0		0	115		0	120		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor												
Frt		0.993									0.947	
Flt Protected	0.950	0.954					0.950					
Satd. Flow (prot)	1593	1676	0	0	1863	0	1676	5085	0	1765	4816	0
Flt Permitted	0.950	0.954					0.950					
Satd. Flow (perm)	1593	1676	0	0	1863	0	1676	5085	0	1765	4816	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		143									161	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		399			148			191			256	
Travel Time (s)		9.1			3.4			4.3			5.8	

Intersection Summary	
Area Type:	Other



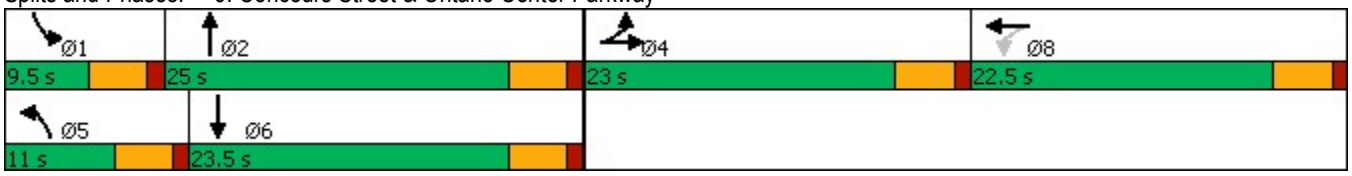
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	162	0	4	0	0	0	37	424	1	0	316	172
Future Volume (vph)	162	0	4	0	0	0	37	424	1	0	316	172
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	180	0	4	0	0	0	41	471	1	0	351	191
Shared Lane Traffic (%)	49%											
Lane Group Flow (vph)	92	92	0	0	0	0	41	472	0	0	542	0

Intersection Summary

Lane Group	EBL	EBT	NBL	NBT	SBT	Ø1	Ø8
Lane Configurations							
Traffic Volume (vph)	162	0	37	424	316		
Future Volume (vph)	162	0	37	424	316		
Turn Type	Split	NA	Prot	NA	NA		
Protected Phases	4	4	5	2	6	1	8
Permitted Phases							
Detector Phase	4	4	5	2	6		
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	9.5	22.5
Total Split (s)	23.0	23.0	11.0	25.0	23.5	9.5	22.5
Total Split (%)	28.8%	28.8%	13.8%	31.3%	29.4%	12%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		
Lead/Lag			Lead	Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	Min	Min	None	None
Act Effct Green (s)	7.8	7.8	6.3	17.2	15.7		
Actuated g/C Ratio	0.25	0.25	0.20	0.56	0.51		
v/c Ratio	0.23	0.17	0.12	0.17	0.21		
Control Delay	11.8	2.4	13.1	5.0	5.5		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	11.8	2.4	13.1	5.0	5.5		
LOS	B	A	B	A	A		
Approach Delay		7.1		5.6	5.5		
Approach LOS		A		A	A		

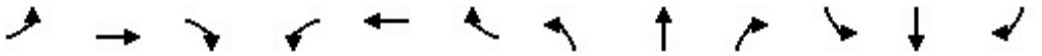
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 30.8	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.23	
Intersection Signal Delay: 5.8	Intersection LOS: A
Intersection Capacity Utilization 30.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Concours Street & Ontario Center Parkway



Lane Group	EBL	EBT	NBL	NBT	SBT
Lane Group Flow (vph)	92	92	41	472	542
v/c Ratio	0.23	0.17	0.12	0.17	0.21
Control Delay	11.8	2.4	13.1	5.0	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	2.4	13.1	5.0	5.5
Queue Length 50th (ft)	9	0	4	13	11
Queue Length 95th (ft)	48	14	28	28	45
Internal Link Dist (ft)		319		111	176
Turn Bay Length (ft)	170		115		
Base Capacity (vph)	991	1097	366	3777	3372
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.09	0.08	0.11	0.12	0.16

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	162	0	4	0	0	0	37	424	1	0	316	172
Future Volume (veh/h)	162	0	4	0	0	0	37	424	1	0	316	172
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1870	1870	1870	1870	1870	1772	1870	1870	1772	1870	1870
Adj Flow Rate, veh/h	184	0	0	0	0	0	41	471	1	0	351	191
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	477	264	0	0	7	0	83	2702	6	6	993	462
Arrive On Green	0.14	0.00	0.00	0.00	0.00	0.00	0.05	0.51	0.51	0.00	0.29	0.29
Sat Flow, veh/h	3375	1870	0	0	1870	0	1688	5261	11	1688	3404	1585
Grp Volume(v), veh/h	184	0	0	0	0	0	41	305	167	0	351	191
Grp Sat Flow(s),veh/h/ln	1688	1870	0	0	1870	0	1688	1702	1868	1688	1702	1585
Q Serve(g_s), s	1.3	0.0	0.0	0.0	0.0	0.0	0.6	1.2	1.2	0.0	2.1	2.5
Cycle Q Clear(g_c), s	1.3	0.0	0.0	0.0	0.0	0.0	0.6	1.2	1.2	0.0	2.1	2.5
Prop In Lane	1.00		0.00	0.00		0.00	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	477	264	0	0	7	0	83	1748	959	6	993	462
V/C Ratio(X)	0.39	0.00	0.00	0.00	0.00	0.00	0.49	0.17	0.17	0.00	0.35	0.41
Avail Cap(c_a), veh/h	2395	1327	0	0	1291	0	421	2677	1469	324	2481	1155
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	10.2	0.0	0.0	0.0	0.0	0.0	12.1	3.4	3.4	0.0	7.3	7.4
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.1	0.0	0.2	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.1	0.0	0.5	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.7	0.0	0.0	0.0	0.0	0.0	16.5	3.4	3.5	0.0	7.5	8.0
LnGrp LOS	B	A	A	A	A	A	B	A	A	A	A	A
Approach Vol, veh/h		184			0			513			542	
Approach Delay, s/veh		10.7			0.0			4.5			7.7	
Approach LOS		B						A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	17.9		8.2	5.8	12.1		0.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	20.5		18.5	6.5	19.0		18.0				
Max Q Clear Time (g_c+I1), s	0.0	3.2		3.3	2.6	4.5		0.0				
Green Ext Time (p_c), s	0.0	2.7		0.5	0.0	3.1		0.0				

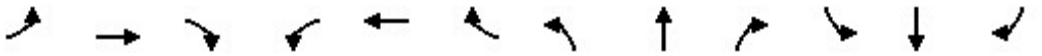
Intersection Summary	
HCM 6th Ctrl Delay	6.8
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		280	140		135	235		135	225		160
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			382			243			215			270
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		635			349			993			1030	
Travel Time (s)		14.4			7.9			22.6			23.4	

Intersection Summary	
Area Type:	Other



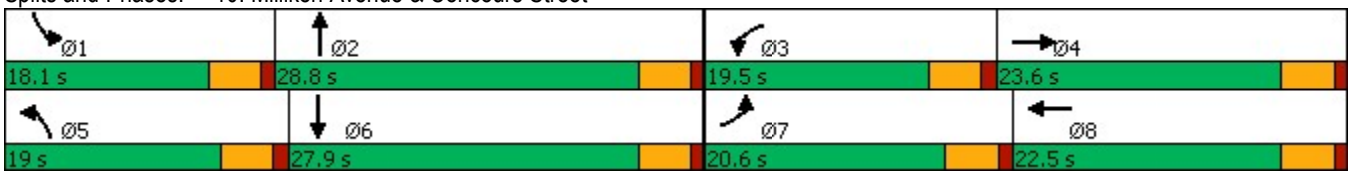
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	466	219	355	366	143	226	417	1400	341	393	1406	374
Future Volume (vph)	466	219	355	366	143	226	417	1400	341	393	1406	374
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	501	235	382	394	154	243	448	1505	367	423	1512	402
Shared Lane Traffic (%)												
Lane Group Flow (vph)	501	235	382	394	154	243	448	1505	367	423	1512	402

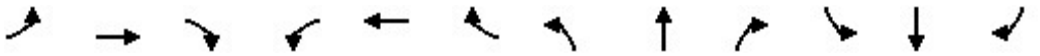
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	466	219	355	366	143	226	417	1400	341	393	1406	374
Future Volume (vph)	466	219	355	366	143	226	417	1400	341	393	1406	374
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	20.6	23.6		19.5	22.5		19.0	28.8		18.1	27.9	
Total Split (%)	22.9%	26.2%		21.7%	25.0%		21.1%	32.0%		20.1%	31.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	15.8	11.3	81.2	14.0	9.4	81.2	14.3	24.3	81.2	13.6	23.5	81.2
Actuated g/C Ratio	0.19	0.14	1.00	0.17	0.12	1.00	0.18	0.30	1.00	0.17	0.29	1.00
v/c Ratio	0.84	0.48	0.24	0.74	0.37	0.15	0.83	0.78	0.23	0.82	0.81	0.25
Control Delay	45.9	36.0	0.4	41.6	35.7	0.2	47.3	29.9	0.3	48.4	31.5	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	36.0	0.4	41.6	35.7	0.2	47.3	29.9	0.3	48.4	31.5	0.4
LOS	D	D	A	D	D	A	D	C	A	D	C	A
Approach Delay		28.3			27.7			28.5			29.2	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 81.2	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 28.6	Intersection LOS: C
Intersection Capacity Utilization 67.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 10: Milliken Avenue & Concours Street

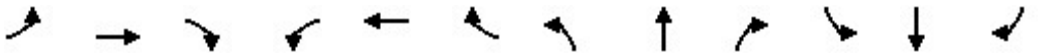




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	501	235	382	394	154	243	448	1505	367	423	1512	402
v/c Ratio	0.84	0.48	0.24	0.74	0.37	0.15	0.83	0.78	0.23	0.82	0.81	0.25
Control Delay	45.9	36.0	0.4	41.6	35.7	0.2	47.3	29.9	0.3	48.4	31.5	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	36.0	0.4	41.6	35.7	0.2	47.3	29.9	0.3	48.4	31.5	0.4
Queue Length 50th (ft)	127	60	0	97	38	0	114	203	0	108	208	0
Queue Length 95th (ft)	#216	94	0	#151	67	0	#198	259	0	#192	265	0
Internal Link Dist (ft)		555			269			913			950	
Turn Bay Length (ft)	200		280	140		135	235		135	225		160
Base Capacity (vph)	609	833	1583	567	785	1583	548	1919	1583	514	1858	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.28	0.24	0.69	0.20	0.15	0.82	0.78	0.23	0.82	0.81	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



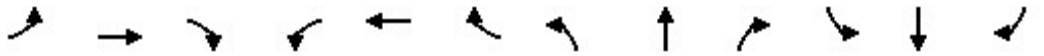
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	466	219	355	366	143	226	417	1400	341	393	1406	374
Future Volume (veh/h)	466	219	355	366	143	226	417	1400	341	393	1406	374
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	501	235	0	394	154	0	448	1505	0	423	1512	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	594	398		491	280		538	2016		511	1959	
Arrive On Green	0.19	0.11	0.00	0.16	0.08	0.00	0.17	0.31	0.00	0.17	0.30	0.00
Sat Flow, veh/h	3092	3554	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	501	235	0	394	154	0	448	1505	0	423	1512	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	11.2	4.5	0.0	8.8	3.0	0.0	10.1	15.1	0.0	9.5	15.3	0.0
Cycle Q Clear(g_c), s	11.2	4.5	0.0	8.8	3.0	0.0	10.1	15.1	0.0	9.5	15.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	594	398		491	280		538	2016		511	1959	
V/C Ratio(X)	0.84	0.59		0.80	0.55		0.83	0.75		0.83	0.77	
Avail Cap(c_a), veh/h	693	945		646	890		624	2176		585	2096	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.0	30.3	0.0	29.1	31.9	0.0	28.7	22.1	0.0	29.0	22.7	0.0
Incr Delay (d2), s/veh	8.2	1.4	0.0	5.5	1.7	0.0	8.4	1.3	0.0	8.6	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	1.9	0.0	3.5	1.3	0.0	4.2	5.5	0.0	4.0	5.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.2	31.7	0.0	34.6	33.6	0.0	37.0	23.5	0.0	37.6	24.4	0.0
LnGrp LOS	D	C		C	C		D	C		D	C	
Approach Vol, veh/h		736	A		548	A		1953	A		1935	A
Approach Delay, s/veh		34.8			34.3			26.6			27.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.4	27.0	15.9	12.6	17.0	26.4	18.3	10.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.6	24.3	15.0	19.1	14.5	23.4	16.1	18.0
Max Q Clear Time (g_c+I1), s	11.5	17.1	10.8	6.5	12.1	17.3	13.2	5.0
Green Ext Time (p_c), s	0.4	5.3	0.6	1.1	0.4	4.5	0.6	0.7

Intersection Summary	
HCM 6th Ctrl Delay	28.8
HCM 6th LOS	C

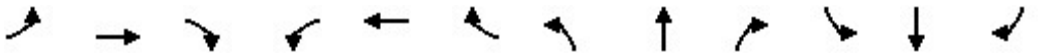
Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1600	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		130	290		230	490		230	145		250
Storage Lanes	2		1	3		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3539	1583	4202	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3539	1583	4202	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			182			466			182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		545			678			1034			973	
Travel Time (s)		12.4			15.4			23.5			22.1	

Intersection Summary	
Area Type:	Other



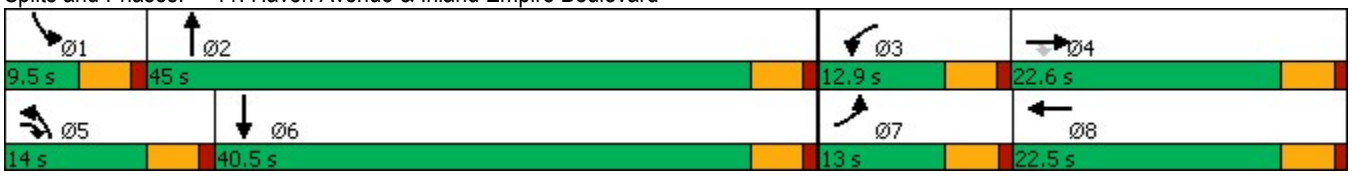
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	224	176	367	265	173	99	252	2404	798	77	2115	199
Future Volume (vph)	224	176	367	265	173	99	252	2404	798	77	2115	199
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	231	181	378	273	178	102	260	2478	823	79	2180	205
Shared Lane Traffic (%)												
Lane Group Flow (vph)	231	181	378	273	178	102	260	2478	823	79	2180	205

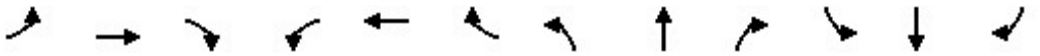
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	224	176	367	265	173	99	252	2404	798	77	2115	199
Future Volume (vph)	224	176	367	265	173	99	252	2404	798	77	2115	199
Turn Type	Prot	NA	pm+ov	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			Free			Free			Free
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	9.5	9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	13.0	22.6	14.0	12.9	22.5		14.0	45.0		9.5	40.5	
Total Split (%)	14.4%	25.1%	15.6%	14.3%	25.0%		15.6%	50.0%		10.6%	45.0%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Act Effct Green (s)	8.5	9.6	23.5	8.3	9.4	81.4	9.4	42.4	81.4	5.0	36.0	81.4
Actuated g/C Ratio	0.10	0.12	0.29	0.10	0.12	1.00	0.12	0.52	1.00	0.06	0.44	1.00
v/c Ratio	0.72	0.43	0.74	0.64	0.44	0.06	0.73	0.74	0.52	0.42	0.77	0.13
Control Delay	50.0	36.7	30.9	42.7	36.9	0.1	48.6	17.7	1.2	44.5	21.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	36.7	30.9	42.7	36.9	0.1	48.6	17.7	1.2	44.5	21.7	0.2
LOS	D	D	C	D	D	A	D	B	A	D	C	A
Approach Delay		37.8			33.0			16.2			20.6	
Approach LOS		D			C			B			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 81.4	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 21.2	Intersection LOS: C
Intersection Capacity Utilization 70.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 11: Haven Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	231	181	378	273	178	102	260	2478	823	79	2180	205
v/c Ratio	0.72	0.43	0.74	0.64	0.44	0.06	0.73	0.74	0.52	0.42	0.77	0.13
Control Delay	50.0	36.7	30.9	42.7	36.9	0.1	48.6	17.7	1.2	44.5	21.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	36.7	30.9	42.7	36.9	0.1	48.6	17.7	1.2	44.5	21.7	0.2
Queue Length 50th (ft)	59	45	140	48	45	0	67	284	0	20	263	0
Queue Length 95th (ft)	#114	76	241	76	76	0	#124	356	0	43	328	0
Internal Link Dist (ft)		465			598			954			893	
Turn Bay Length (ft)	130		130	290		230	490		230	145		250
Base Capacity (vph)	320	787	510	434	783	1583	358	3340	1583	188	2836	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.23	0.74	0.63	0.23	0.06	0.73	0.74	0.52	0.42	0.77	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	224	176	367	265	173	99	252	2404	798	77	2115	199
Future Volume (veh/h)	224	176	367	265	173	99	252	2404	798	77	2115	199
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1575	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	231	181	378	273	178	0	260	2478	0	79	2180	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	295	729	491	366	697		324	2934		150	2571	
Arrive On Green	0.10	0.21	0.21	0.09	0.20	0.00	0.10	0.46	0.00	0.05	0.40	0.00
Sat Flow, veh/h	3092	3554	1585	4230	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	231	181	378	273	178	0	260	2478	0	79	2180	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1410	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	6.4	3.8	18.1	5.6	3.7	0.0	7.3	30.1	0.0	2.2	27.2	0.0
Cycle Q Clear(g_c), s	6.4	3.8	18.1	5.6	3.7	0.0	7.3	30.1	0.0	2.2	27.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	295	729	491	366	697		324	2934		150	2571	
V/C Ratio(X)	0.78	0.25	0.77	0.75	0.26		0.80	0.84		0.53	0.85	
Avail Cap(c_a), veh/h	298	729	491	402	725		333	2952		175	2624	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	39.0	29.4	27.6	39.4	30.0	0.0	38.6	21.2	0.0	41.0	24.1	0.0
Incr Delay (d2), s/veh	12.6	0.2	7.3	6.7	0.2	0.0	12.9	2.4	0.0	2.9	2.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	1.6	8.0	2.1	1.6	0.0	3.3	11.0	0.0	0.9	10.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.7	29.6	34.9	46.1	30.2	0.0	51.5	23.7	0.0	43.9	26.8	0.0
LnGrp LOS	D	C	C	D	C		D	C		D	C	
Approach Vol, veh/h		790			451	A		2738	A		2259	A
Approach Delay, s/veh		38.6			39.8			26.3			27.4	
Approach LOS		D			D			C			C	

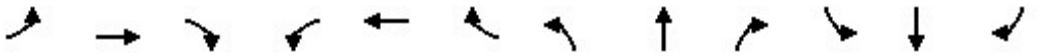
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.8	44.8	12.1	22.6	13.8	39.8	12.9	21.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	40.5	8.4	18.1	9.5	36.0	8.5	18.0
Max Q Clear Time (g_c+I1), s	4.2	32.1	7.6	20.1	9.3	29.2	8.4	5.7
Green Ext Time (p_c), s	0.0	7.8	0.1	0.0	0.0	6.1	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	29.2
HCM 6th LOS	C

Notes

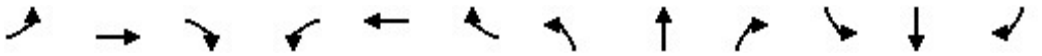
User approved changes to right turn type.

Unsignalized Delay for [NBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		130	255		210	330		160	200		120
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	3539	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			354			197			564			193
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			447			1114			993	
Travel Time (s)		11.9			10.2			25.3			22.6	

Intersection Summary	
Area Type:	Other



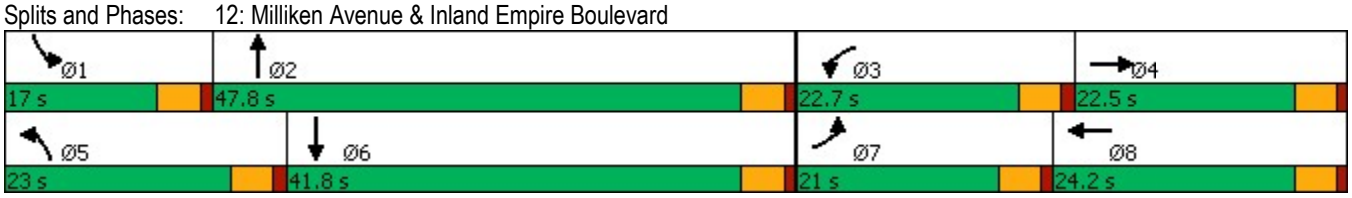
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	251	417	382	504	195	191	488	1643	1112	200	1948	157
Future Volume (vph)	251	417	382	504	195	191	488	1643	1112	200	1948	157
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	259	430	394	520	201	197	503	1694	1146	206	2008	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	259	430	394	520	201	197	503	1694	1146	206	2008	162

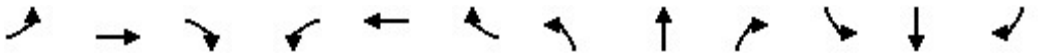
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	251	417	382	504	195	191	488	1643	1112	200	1948	157
Future Volume (vph)	251	417	382	504	195	191	488	1643	1112	200	1948	157
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	21.0	22.5		22.7	24.2		23.0	47.8		17.0	41.8	
Total Split (%)	19.1%	20.5%		20.6%	22.0%		20.9%	43.5%		15.5%	38.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)	14.0	16.8	108.8	18.2	21.0	108.8	18.5	44.4	108.8	11.4	37.3	108.8
Actuated g/C Ratio	0.13	0.15	1.00	0.17	0.19	1.00	0.17	0.41	1.00	0.10	0.34	1.00
v/c Ratio	0.66	0.79	0.25	1.01	0.29	0.12	0.96	0.65	0.72	0.64	0.91	0.10
Control Delay	53.3	55.6	0.4	88.6	39.5	0.2	77.0	27.7	2.9	56.2	42.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.3	55.6	0.4	88.6	39.5	0.2	77.0	27.7	2.9	56.2	42.0	0.1
LOS	D	E	A	F	D	A	E	C	A	E	D	A
Approach Delay		35.0			58.9			26.6			40.4	
Approach LOS		C			E			C			D	

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 108.8	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 35.9	Intersection LOS: D
Intersection Capacity Utilization 86.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 12: Milliken Avenue & Inland Empire Boulevard





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	259	430	394	520	201	197	503	1694	1146	206	2008	162
v/c Ratio	0.66	0.79	0.25	1.01	0.29	0.12	0.96	0.65	0.72	0.64	0.91	0.10
Control Delay	53.3	55.6	0.4	88.6	39.5	0.2	77.0	27.7	2.9	56.2	42.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.3	55.6	0.4	88.6	39.5	0.2	77.0	27.7	2.9	56.2	42.0	0.1
Queue Length 50th (ft)	90	154	0	~202	64	0	184	282	0	72	393	0
Queue Length 95th (ft)	131	210	0	#309	101	0	#292	324	0	111	#451	0
Internal Link Dist (ft)		443			367			1034			913	
Turn Bay Length (ft)	125		130	255		210	330		160	200		120
Base Capacity (vph)	465	585	1583	514	682	1583	522	2614	1583	353	2197	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.74	0.25	1.01	0.29	0.12	0.96	0.65	0.72	0.58	0.91	0.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	251	417	382	504	195	191	488	1643	1112	200	1948	157
Future Volume (veh/h)	251	417	382	504	195	191	488	1643	1112	200	1948	157
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	259	430	0	520	201	0	503	1694	0	206	2008	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	323	514		525	746		534	2778		265	2219	
Arrive On Green	0.10	0.14	0.00	0.17	0.21	0.00	0.17	0.43	0.00	0.09	0.34	0.00
Sat Flow, veh/h	3092	3554	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	259	430	0	520	201	0	503	1694	0	206	2008	0
Grp Sat Flow(s),veh/h/ln	1546	1777	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	8.8	12.6	0.0	18.0	5.1	0.0	17.2	21.8	0.0	7.0	31.8	0.0
Cycle Q Clear(g_c), s	8.8	12.6	0.0	18.0	5.1	0.0	17.2	21.8	0.0	7.0	31.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	323	514		525	746		534	2778		265	2219	
V/C Ratio(X)	0.80	0.84		0.99	0.27		0.94	0.61		0.78	0.90	
Avail Cap(c_a), veh/h	476	597		525	746		534	2778		361	2240	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	46.9	44.6	0.0	44.4	35.4	0.0	43.8	23.5	0.0	48.0	33.4	0.0
Incr Delay (d2), s/veh	6.0	9.0	0.0	36.6	0.2	0.0	25.3	0.4	0.0	7.2	5.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	6.2	0.0	9.5	2.2	0.0	8.4	8.1	0.0	2.9	13.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.9	53.6	0.0	81.0	35.6	0.0	69.1	23.9	0.0	55.2	39.1	0.0
LnGrp LOS	D	D		F	D		E	C		E	D	
Approach Vol, veh/h		689	A		721	A		2197	A		2214	A
Approach Delay, s/veh		53.3			68.3			34.2			40.6	
Approach LOS		D			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.7	50.8	22.7	20.0	23.0	41.4	15.7	27.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	43.3	18.2	18.0	18.5	37.3	16.5	19.7
Max Q Clear Time (g_c+I1), s	9.0	23.8	20.0	14.6	19.2	33.8	10.8	7.1
Green Ext Time (p_c), s	0.2	12.5	0.0	0.9	0.0	3.1	0.4	0.9

Intersection Summary	
HCM 6th Ctrl Delay	43.1
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1800	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	175	0		0	0	
Storage Lanes	2	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	0.91	0.86	1.00	1.00	0.86
Ped Bike Factor						
Frt	0.925	0.850				
Flt Protected	0.976					
Satd. Flow (prot)	3091	1441	6408	0	0	6408
Flt Permitted	0.976					
Satd. Flow (perm)	3091	1441	6408	0	0	6408
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	1	1				
Link Speed (mph)	30		30			30
Link Distance (ft)	592		1067			1034
Travel Time (s)	13.5		24.3			23.5

Intersection Summary	
Area Type:	Other

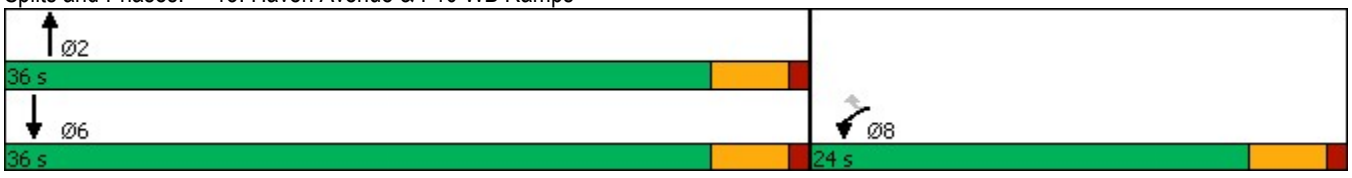
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	339	677	2709	0	0	1817
Future Volume (vph)	339	677	2709	0	0	1817
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.98	0.98	0.98	0.92	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	346	691	2764	0	0	1854
Shared Lane Traffic (%)		50%				
Lane Group Flow (vph)	692	345	2764	0	0	1854

Intersection Summary

Lane Group	WBL	WBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	339	677	2709	1817
Future Volume (vph)	339	677	2709	1817
Turn Type	Prot	Perm	NA	NA
Protected Phases	8		2	6
Permitted Phases		8		
Detector Phase	8	8	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	36.0	36.0
Total Split (%)	40.0%	40.0%	60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	17.5	17.5	31.6	31.6
Actuated g/C Ratio	0.30	0.30	0.54	0.54
v/c Ratio	0.74	0.79	0.79	0.53
Control Delay	23.7	34.1	13.2	9.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.7	34.1	13.2	9.6
LOS	C	C	B	A
Approach Delay	27.2		13.2	9.6
Approach LOS	C		B	A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 58.1	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 14.6	Intersection LOS: B
Intersection Capacity Utilization 89.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 13: Haven Avenue & I-10 WB Ramps



Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	692	345	2764	1854
v/c Ratio	0.74	0.79	0.79	0.53
Control Delay	23.7	34.1	13.2	9.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.7	34.1	13.2	9.6
Queue Length 50th (ft)	109	118	221	118
Queue Length 95th (ft)	162	#249	271	148
Internal Link Dist (ft)	512		987	954
Turn Bay Length (ft)	175			
Base Capacity (vph)	1040	485	3482	3482
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.67	0.71	0.79	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

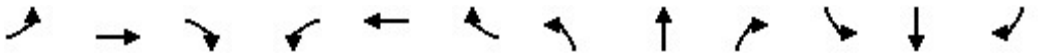
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	339	677	2709	0	0	1817
Future Volume (veh/h)	339	677	2709	0	0	1817
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1772	1870	1870	0	0	1870
Adj Flow Rate, veh/h	346	691	2764	0	0	1854
Peak Hour Factor	0.98	0.98	0.98	0.92	0.98	0.98
Percent Heavy Veh, %	2	2	2	0	0	2
Cap, veh/h	473	888	3587	0	0	3587
Arrive On Green	0.28	0.28	0.56	0.00	0.00	0.56
Sat Flow, veh/h	1688	3170	6958	0	0	6958
Grp Volume(v), veh/h	346	691	2764	0	0	1854
Grp Sat Flow(s),veh/h/ln	1688	1585	1609	0	0	1609
Q Serve(g_s), s	10.3	11.1	18.5	0.0	0.0	9.9
Cycle Q Clear(g_c), s	10.3	11.1	18.5	0.0	0.0	9.9
Prop In Lane	1.00	1.00		0.00	0.00	
Lane Grp Cap(c), veh/h	473	888	3587	0	0	3587
V/C Ratio(X)	0.73	0.78	0.77	0.00	0.00	0.52
Avail Cap(c_a), veh/h	593	1115	3655	0	0	3655
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	18.1	18.4	9.5	0.0	0.0	7.6
Incr Delay (d2), s/veh	3.5	2.8	1.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	4.0	5.0	0.0	0.0	2.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.6	21.2	10.5	0.0	0.0	7.7
LnGrp LOS	C	C	B	A	A	A
Approach Vol, veh/h	1037		2764			1854
Approach Delay, s/veh	21.3		10.5			7.7
Approach LOS	C		B			A

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	35.4			35.4	20.0
Change Period (Y+Rc), s	4.5			4.5	4.5
Max Green Setting (Gmax), s	31.5			31.5	19.5
Max Q Clear Time (g_c+I1), s	20.5			11.9	13.1
Green Ext Time (p_c), s	10.4			13.6	2.4

Intersection Summary	
HCM 6th Ctrl Delay	11.6
HCM 6th LOS	B

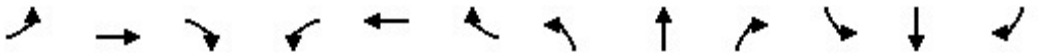
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	1863	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	1863	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			155			125			55
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



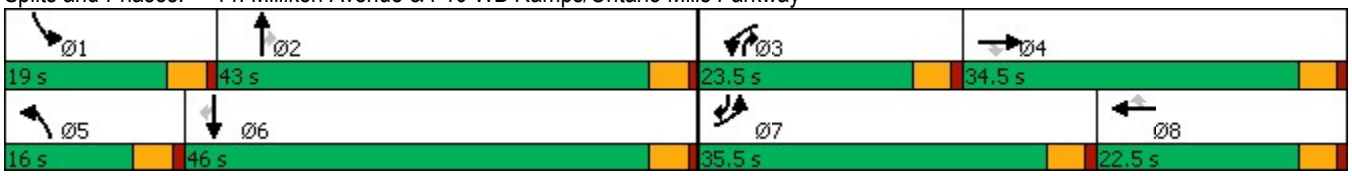
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	941	320	182	388	484	144	294	1907	589	427	1489	1117
Future Volume (vph)	941	320	182	388	484	144	294	1907	589	427	1489	1117
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1012	344	196	417	520	155	316	2051	633	459	1601	1201
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1012	344	196	417	520	155	316	2051	633	459	1601	1201

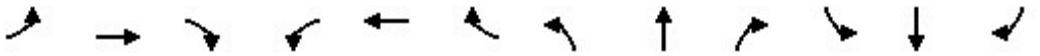
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	941	320	182	388	484	144	294	1907	589	427	1489	1117
Future Volume (vph)	941	320	182	388	484	144	294	1907	589	427	1489	1117
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	35.5	34.5	34.5	23.5	22.5	22.5	16.0	43.0	23.5	19.0	46.0	35.5
Total Split (%)	29.6%	28.8%	28.8%	19.6%	18.8%	18.8%	13.3%	35.8%	19.6%	15.8%	38.3%	29.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	31.0	30.3	30.3	18.7	18.0	18.0	11.5	38.5	61.7	14.5	41.5	77.0
Actuated g/C Ratio	0.26	0.25	0.25	0.16	0.15	0.15	0.10	0.32	0.51	0.12	0.35	0.64
v/c Ratio	1.28	0.73	0.42	0.87	0.98	0.42	1.07	1.00	0.72	1.24	0.72	1.16
Control Delay	171.5	51.7	22.0	68.9	85.8	10.7	124.8	60.2	23.4	171.6	36.5	105.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	171.5	51.7	22.0	68.9	85.8	10.7	124.8	60.2	23.4	171.6	36.5	105.4
LOS	F	D	C	E	F	B	F	E	C	F	D	F
Approach Delay		126.1			68.7			59.3			80.9	
Approach LOS		F			E			E			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.28	
Intersection Signal Delay: 80.0	Intersection LOS: E
Intersection Capacity Utilization 103.2%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway



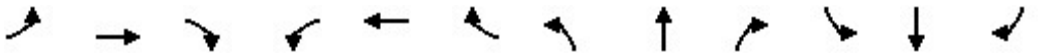


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1012	344	196	417	520	155	316	2051	633	459	1601	1201
v/c Ratio	1.28	0.73	0.42	0.87	0.98	0.42	1.07	1.00	0.72	1.24	0.72	1.16
Control Delay	171.5	51.7	22.0	68.9	85.8	10.7	124.8	60.2	23.4	171.6	36.5	105.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	171.5	51.7	22.0	68.9	85.8	10.7	124.8	60.2	23.4	171.6	36.5	105.4
Queue Length 50th (ft)	~511	246	63	163	213	0	~140	459	298	~227	312	~1089
Queue Length 95th (ft)	#641	356	134	#247	#328	60	#233	#555	449	#333	356	#1353
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	793	469	470	486	530	369	294	2055	878	371	2216	1035
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.28	0.73	0.42	0.86	0.98	0.42	1.07	1.00	0.72	1.24	0.72	1.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	941	320	182	388	484	144	294	1907	589	427	1489	1117
Future Volume (veh/h)	941	320	182	388	484	144	294	1907	589	427	1489	1117
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	1012	344	196	417	520	155	316	2051	633	459	1601	1201
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	799	482	408	466	533	238	296	2064	747	374	2225	958
Arrive On Green	0.26	0.26	0.26	0.15	0.15	0.15	0.10	0.32	0.32	0.12	0.35	0.35
Sat Flow, veh/h	3092	1870	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	1012	344	196	417	520	155	316	2051	633	459	1601	1201
Grp Sat Flow(s),veh/h/ln	1546	1870	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	31.0	20.1	12.6	15.9	17.5	11.1	11.5	38.1	38.5	14.5	26.0	41.5
Cycle Q Clear(g_c), s	31.0	20.1	12.6	15.9	17.5	11.1	11.5	38.1	38.5	14.5	26.0	41.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	799	482	408	466	533	238	296	2064	747	374	2225	958
V/C Ratio(X)	1.27	0.71	0.48	0.89	0.98	0.65	1.07	0.99	0.85	1.23	0.72	1.25
Avail Cap(c_a), veh/h	799	482	408	490	533	238	296	2064	747	374	2225	958
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.5	40.5	37.7	50.0	50.8	48.0	54.2	40.6	27.9	52.8	34.2	23.7
Incr Delay (d2), s/veh	130.0	5.0	0.9	18.2	32.6	6.2	71.0	18.3	9.0	124.3	1.2	123.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	26.2	9.9	5.0	7.3	10.2	4.8	7.4	17.5	17.4	12.1	10.3	57.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	174.5	45.5	38.6	68.2	83.4	54.2	125.2	58.9	36.8	177.0	35.3	146.7
LnGrp LOS	F	D	D	E	F	D	F	E	D	F	D	F
Approach Vol, veh/h		1552			1092			3000			3261	
Approach Delay, s/veh		128.8			73.5			61.2			96.3	
Approach LOS		F			E			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	43.0	22.6	35.4	16.0	46.0	35.5	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	38.5	19.0	30.0	11.5	41.5	31.0	18.0
Max Q Clear Time (g_c+I1), s	16.5	40.5	17.9	22.1	13.5	43.5	33.0	19.5
Green Ext Time (p_c), s	0.0	0.0	0.2	1.8	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	87.3
HCM 6th LOS	F

Notes

User approved changes to right turn type.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	230	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	0.91	1.00	0.86	0.86	1.00
Ped Bike Factor						
Frt	0.992	0.850				
Flt Protected	0.955					
Satd. Flow (prot)	3243	1441	0	6408	6408	0
Flt Permitted	0.955					
Satd. Flow (perm)	3243	1441	0	6408	6408	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	1	1				
Link Speed (mph)	30			30	30	
Link Distance (ft)	521			1400	1067	
Travel Time (s)	11.8			31.8	24.3	

Intersection Summary	
Area Type:	Other

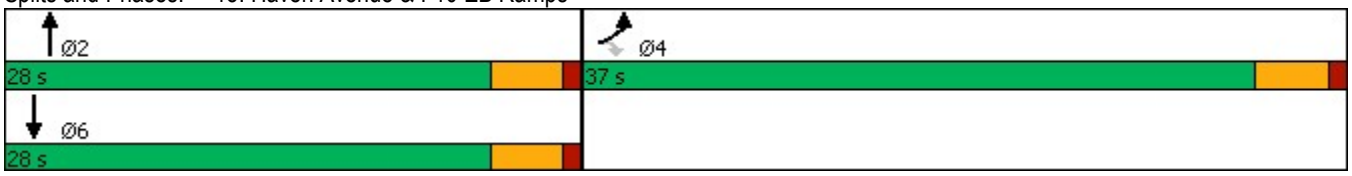
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	1437	752	0	2079	1704	0
Future Volume (vph)	1437	752	0	2079	1704	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1481	775	0	2143	1757	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	1559	697	0	2143	1757	0

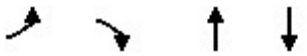
Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1437	752	2079	1704
Future Volume (vph)	1437	752	2079	1704
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	37.0	37.0	28.0	28.0
Total Split (%)	56.9%	56.9%	43.1%	43.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	32.5	32.5	23.5	23.5
Actuated g/C Ratio	0.50	0.50	0.36	0.36
v/c Ratio	0.96	0.97	0.93	0.76
Control Delay	32.4	45.3	28.7	20.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	32.4	45.3	28.7	20.9
LOS	C	D	C	C
Approach Delay	36.4		28.7	20.9
Approach LOS	D		C	C

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 29.2	Intersection LOS: C
Intersection Capacity Utilization 89.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 15: Haven Avenue & I-10 EB Ramps





Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1559	697	2143	1757
v/c Ratio	0.96	0.97	0.93	0.76
Control Delay	32.4	45.3	28.7	20.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	32.4	45.3	28.7	20.9
Queue Length 50th (ft)	284	272	230	173
Queue Length 95th (ft)	#452	#525	#315	215
Internal Link Dist (ft)	441		1320	987
Turn Bay Length (ft)	230			
Base Capacity (vph)	1622	721	2316	2316
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.96	0.97	0.93	0.76

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1437	752	0	2079	1704	0
Future Volume (veh/h)	1437	752	0	2079	1704	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1772	1870	0	1870	1870	0
Adj Flow Rate, veh/h	1502	752	0	2143	1757	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	1684	791	0	2329	2329	0
Arrive On Green	0.50	0.50	0.00	0.36	0.36	0.00
Sat Flow, veh/h	3375	1585	0	6958	6958	0
Grp Volume(v), veh/h	1502	752	0	2143	1757	0
Grp Sat Flow(s),veh/h/ln	1688	1585	0	1609	1609	0
Q Serve(g_s), s	26.0	29.3	0.0	20.6	15.5	0.0
Cycle Q Clear(g_c), s	26.0	29.3	0.0	20.6	15.5	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	1684	791	0	2329	2329	0
V/C Ratio(X)	0.89	0.95	0.00	0.92	0.75	0.00
Avail Cap(c_a), veh/h	1693	795	0	2334	2334	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.6	15.5	0.0	19.8	18.1	0.0
Incr Delay (d2), s/veh	6.4	20.8	0.0	6.6	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.8	13.3	0.0	8.0	5.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.1	36.2	0.0	26.3	19.6	0.0
LnGrp LOS	C	D	A	C	B	A
Approach Vol, veh/h	2254			2143	1757	
Approach Delay, s/veh	26.1			26.3	19.6	
Approach LOS	C			C	B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		28.0		36.8		28.0
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		23.5		32.5		23.5
Max Q Clear Time (g_c+I1), s		22.6		31.3		17.5
Green Ext Time (p_c), s		0.8		1.0		4.9

Intersection Summary		
HCM 6th Ctrl Delay	24.3	
HCM 6th LOS	C	

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1700	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	50	0	295			85
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.86	0.86	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3072	1583	3072	6408	6408	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3072	1583	3072	6408	6408	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		1				51
Link Speed (mph)	30			30	30	
Link Distance (ft)	413			606	902	
Travel Time (s)	9.4			13.8	20.5	

Intersection Summary	
Area Type:	Other

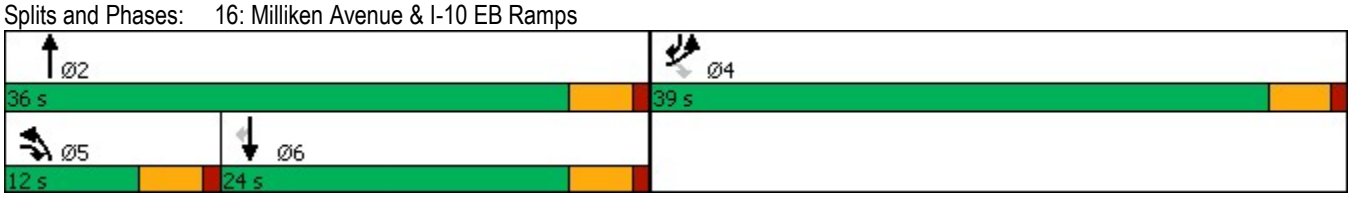
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Volume (vph)	1243	310	221	1617	1183	912
Future Volume (vph)	1243	310	221	1617	1183	912
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1281	320	228	1667	1220	940
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1281	320	228	1667	1220	940

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1243	310	221	1617	1183	912
Future Volume (vph)	1243	310	221	1617	1183	912
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	9.5	22.5	22.5	22.5
Total Split (s)	39.0	12.0	12.0	36.0	24.0	39.0
Total Split (%)	52.0%	16.0%	16.0%	48.0%	32.0%	52.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	34.0	46.0	7.5	31.3	19.3	57.8
Actuated g/C Ratio	0.46	0.62	0.10	0.42	0.26	0.78
v/c Ratio	0.91	0.33	0.74	0.62	0.73	0.76
Control Delay	30.4	7.9	48.6	18.1	28.3	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	7.9	48.6	18.1	28.3	9.1
LOS	C	A	D	B	C	A
Approach Delay	25.9			21.8	20.0	
Approach LOS	C			C	B	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 74.3	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 22.3	Intersection LOS: C
Intersection Capacity Utilization 75.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 16: Milliken Avenue & I-10 EB Ramps



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	1281	320	228	1667	1220	940
v/c Ratio	0.91	0.33	0.74	0.62	0.73	0.76
Control Delay	30.4	7.9	48.6	18.1	28.3	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	7.9	48.6	18.1	28.3	9.1
Queue Length 50th (ft)	271	62	54	170	150	155
Queue Length 95th (ft)	#413	105	#105	206	188	296
Internal Link Dist (ft)	333			526	822	
Turn Bay Length (ft)	50		295			85
Base Capacity (vph)	1426	979	310	2716	1681	1253
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.33	0.74	0.61	0.73	0.75

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

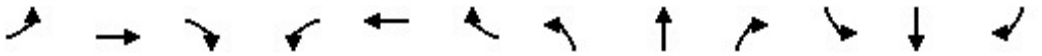
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1243	310	221	1617	1183	912
Future Volume (veh/h)	1243	310	221	1617	1183	912
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1673	1870	1673	1870	1870	1870
Adj Flow Rate, veh/h	1281	320	228	1667	1220	940
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1393	870	304	2743	1714	1137
Arrive On Green	0.45	0.45	0.10	0.43	0.27	0.27
Sat Flow, veh/h	3092	1585	3092	6696	6696	1585
Grp Volume(v), veh/h	1281	320	228	1667	1220	940
Grp Sat Flow(s),veh/h/ln	1546	1585	1546	1609	1609	1585
Q Serve(g_s), s	28.4	8.3	5.3	14.7	12.6	19.5
Cycle Q Clear(g_c), s	28.4	8.3	5.3	14.7	12.6	19.5
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1393	870	304	2743	1714	1137
V/C Ratio(X)	0.92	0.37	0.75	0.61	0.71	0.83
Avail Cap(c_a), veh/h	1458	903	317	2770	1714	1137
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.9	9.3	32.1	16.2	24.3	5.7
Incr Delay (d2), s/veh	9.5	0.3	9.2	0.4	1.4	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.9	9.5	2.3	5.0	4.7	18.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.3	9.6	41.3	16.6	25.7	10.9
LnGrp LOS	C	A	D	B	C	B
Approach Vol, veh/h	1601			1895	2160	
Approach Delay, s/veh	24.6			19.6	19.2	
Approach LOS	C			B	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		35.7		37.5	11.7	24.0
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		31.5		34.5	7.5	19.5
Max Q Clear Time (g_c+I1), s		16.7		30.4	7.3	21.5
Green Ext Time (p_c), s		10.1		2.5	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	20.9
HCM 6th LOS	C

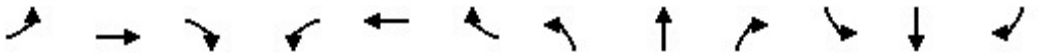
Appendix J

Intersection LOS Analysis Sheets
Horizon Year (2040) With Project Conditions
With Improvements



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	3		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.94	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	4202	1863	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	4202	1863	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			186			205			473			162
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



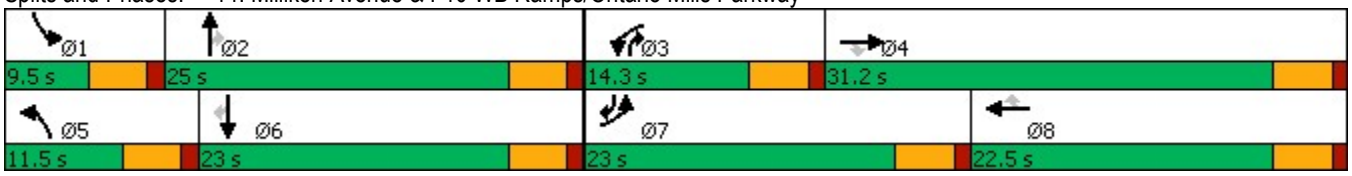
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	852	125	332	227	259	48	216	1256	421	117	835	354
Future Volume (vph)	852	125	332	227	259	48	216	1256	421	117	835	354
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	957	140	373	255	291	54	243	1411	473	131	938	398
Shared Lane Traffic (%)												
Lane Group Flow (vph)	957	140	373	255	291	54	243	1411	473	131	938	398

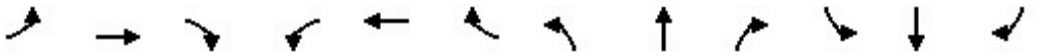
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	852	125	332	227	259	48	216	1256	421	117	835	354
Future Volume (vph)	852	125	332	227	259	48	216	1256	421	117	835	354
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	23.0	31.2	31.2	14.3	22.5	22.5	11.5	25.0	14.3	9.5	23.0	23.0
Total Split (%)	28.8%	39.0%	39.0%	17.9%	28.1%	28.1%	14.4%	31.3%	17.9%	11.9%	28.8%	28.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	18.5	21.0	21.0	9.5	11.9	11.9	7.0	20.5	34.5	5.0	18.5	41.6
Actuated g/C Ratio	0.25	0.28	0.28	0.13	0.16	0.16	0.09	0.28	0.47	0.07	0.25	0.56
v/c Ratio	0.91	0.27	0.64	0.65	0.51	0.13	0.84	0.79	0.48	0.63	0.58	0.41
Control Delay	41.9	21.9	16.8	40.0	31.5	0.6	59.9	29.4	3.3	49.8	26.5	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.9	21.9	16.8	40.0	31.5	0.6	59.9	29.4	3.3	49.8	26.5	7.2
LOS	D	C	B	D	C	A	E	C	A	D	C	A
Approach Delay		33.6			32.3			27.1			23.3	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 74	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 28.4	Intersection LOS: C
Intersection Capacity Utilization 63.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	957	140	373	255	291	54	243	1411	473	131	938	398
v/c Ratio	0.91	0.27	0.64	0.65	0.51	0.13	0.84	0.79	0.48	0.63	0.58	0.41
Control Delay	41.9	21.9	16.8	40.0	31.5	0.6	59.9	29.4	3.3	49.8	26.5	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.9	21.9	16.8	40.0	31.5	0.6	59.9	29.4	3.3	49.8	26.5	7.2
Queue Length 50th (ft)	148	50	70	57	64	0	56	170	0	30	108	50
Queue Length 95th (ft)	#250	91	153	#103	98	0	#127	235	49	#72	154	124
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	1052	673	691	407	862	540	291	1778	995	207	1605	960
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.21	0.54	0.63	0.34	0.10	0.84	0.79	0.48	0.63	0.58	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

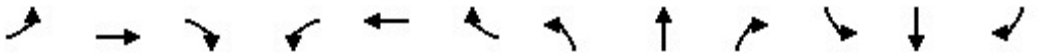
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	852	125	332	227	259	48	216	1256	421	117	835	354
Future Volume (veh/h)	852	125	332	227	259	48	216	1256	421	117	835	354
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	957	140	373	255	291	54	243	1411	473	131	938	398
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1079	512	434	342	460	205	310	1879	638	204	1659	813
Arrive On Green	0.26	0.27	0.27	0.11	0.13	0.13	0.10	0.29	0.29	0.07	0.26	0.26
Sat Flow, veh/h	4230	1870	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	957	140	373	255	291	54	243	1411	473	131	938	398
Grp Sat Flow(s),veh/h/ln	1410	1870	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	15.2	4.1	15.6	5.6	5.4	2.1	5.4	13.9	17.8	2.9	8.9	11.4
Cycle Q Clear(g_c), s	15.2	4.1	15.6	5.6	5.4	2.1	5.4	13.9	17.8	2.9	8.9	11.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1079	512	434	342	460	205	310	1879	638	204	1659	813
V/C Ratio(X)	0.89	0.27	0.86	0.75	0.63	0.26	0.78	0.75	0.74	0.64	0.57	0.49
Avail Cap(c_a), veh/h	1120	715	606	434	915	408	310	1888	640	221	1703	824
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.1	19.9	24.1	30.1	28.8	27.4	30.7	22.4	17.8	31.8	22.5	11.1
Incr Delay (d2), s/veh	8.6	0.3	8.8	5.2	1.4	0.7	12.4	1.7	4.6	5.5	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	1.7	6.5	2.2	2.3	0.8	2.5	5.1	6.7	1.2	3.2	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.7	20.2	32.9	35.4	30.3	28.1	43.1	24.1	22.4	37.4	22.9	11.5
LnGrp LOS	C	C	C	D	C	C	D	C	C	D	C	B
Approach Vol, veh/h		1470			600			2127			1467	
Approach Delay, s/veh		32.2			32.2			25.9			21.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.1	24.9	12.2	23.6	11.5	22.5	22.3	13.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	20.5	9.8	26.7	7.0	18.5	18.5	18.0
Max Q Clear Time (g_c+I1), s	4.9	19.8	7.6	17.6	7.4	13.4	17.2	7.4
Green Ext Time (p_c), s	0.0	0.7	0.2	1.5	0.0	3.3	0.6	1.4

Intersection Summary	
HCM 6th Ctrl Delay	27.0
HCM 6th LOS	C

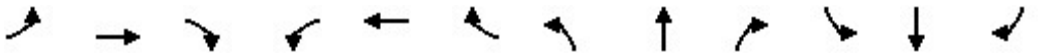
Notes

User approved changes to right turn type.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	3		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.94	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	4202	1863	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	4202	1863	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			142			177			143			55
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



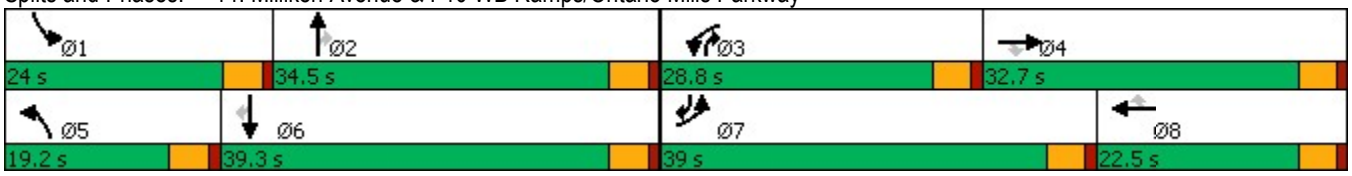
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1162	275	332	354	421	89	337	1441	634	465	1572	670
Future Volume (vph)	1162	275	332	354	421	89	337	1441	634	465	1572	670
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1210	286	346	369	439	93	351	1501	660	484	1638	698
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1210	286	346	369	439	93	351	1501	660	484	1638	698

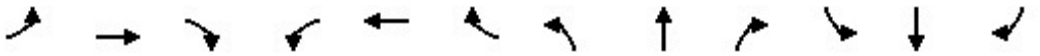
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1162	275	332	354	421	89	337	1441	634	465	1572	670
Future Volume (vph)	1162	275	332	354	421	89	337	1441	634	465	1572	670
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	39.0	32.7	32.7	28.8	22.5	22.5	19.2	34.5	28.8	24.0	39.3	39.0
Total Split (%)	32.5%	27.3%	27.3%	24.0%	18.8%	18.8%	16.0%	28.8%	24.0%	20.0%	32.8%	32.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	34.5	31.3	31.3	20.7	17.5	17.5	14.7	30.0	55.2	19.5	34.8	73.8
Actuated g/C Ratio	0.29	0.26	0.26	0.17	0.15	0.15	0.12	0.25	0.46	0.16	0.29	0.62
v/c Ratio	1.00	0.59	0.67	0.69	0.85	0.24	0.93	0.93	0.82	0.97	0.88	0.70
Control Delay	67.9	45.2	30.6	53.4	65.9	1.5	83.8	55.3	30.6	82.6	46.8	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.9	45.2	30.6	53.4	65.9	1.5	83.8	55.3	30.6	82.6	46.8	18.8
LOS	E	D	C	D	E	A	F	E	C	F	D	B
Approach Delay		57.4			54.2			52.8			46.0	
Approach LOS		E			D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.5	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 51.6	Intersection LOS: D
Intersection Capacity Utilization 88.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1210	286	346	369	439	93	351	1501	660	484	1638	698
v/c Ratio	1.00	0.59	0.67	0.69	0.85	0.24	0.93	0.93	0.82	0.97	0.88	0.70
Control Delay	67.9	45.2	30.6	53.4	65.9	1.5	83.8	55.3	30.6	82.6	46.8	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.9	45.2	30.6	53.4	65.9	1.5	83.8	55.3	30.6	82.6	46.8	18.8
Queue Length 50th (ft)	~333	194	143	139	175	0	140	332	349	194	352	317
Queue Length 95th (ft)	#438	298	262	186	#254	0	#232	#404	500	#302	401	464
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	1213	488	519	625	532	388	378	1609	851	501	1866	998
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.59	0.67	0.59	0.83	0.24	0.93	0.93	0.78	0.97	0.88	0.70

Intersection Summary

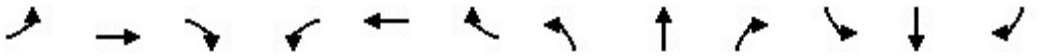
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1162	275	332	354	421	89	337	1441	634	465	1572	670
Future Volume (veh/h)	1162	275	332	354	421	89	337	1441	634	465	1572	670
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	1210	286	346	369	439	93	351	1501	660	484	1638	698
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1227	546	462	435	506	225	382	1623	623	507	1883	924
Arrive On Green	0.29	0.29	0.29	0.14	0.14	0.14	0.12	0.25	0.25	0.16	0.29	0.29
Sat Flow, veh/h	4230	1870	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	1210	286	346	369	439	93	351	1501	660	484	1638	698
Grp Sat Flow(s),veh/h/ln	1410	1870	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	33.8	15.2	23.5	13.8	14.4	6.4	13.3	27.1	30.0	18.5	28.7	34.8
Cycle Q Clear(g_c), s	33.8	15.2	23.5	13.8	14.4	6.4	13.3	27.1	30.0	18.5	28.7	34.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1227	546	462	435	506	225	382	1623	623	507	1883	924
V/C Ratio(X)	0.99	0.52	0.75	0.85	0.87	0.41	0.92	0.92	1.06	0.95	0.87	0.76
Avail Cap(c_a), veh/h	1227	546	462	632	538	240	382	1623	623	507	1883	924
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.0	35.2	38.2	49.9	49.9	46.5	51.5	43.4	36.1	49.3	39.9	18.5
Incr Delay (d2), s/veh	22.3	0.9	6.6	7.3	13.6	1.2	26.7	9.4	52.9	28.8	4.7	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.1	7.1	9.9	5.8	7.3	2.6	6.6	11.7	26.7	9.1	11.9	14.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.2	36.1	44.8	57.1	63.5	47.7	78.2	52.8	89.0	78.1	44.6	22.1
LnGrp LOS	E	D	D	E	E	D	E	D	F	E	D	C
Approach Vol, veh/h		1842			901			2512			2820	
Approach Delay, s/veh		56.2			59.3			65.8			44.8	
Approach LOS		E			E			E			D	

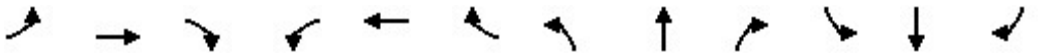
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.0	34.5	21.2	39.2	19.2	39.3	39.0	21.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	19.5	30.0	24.3	28.2	14.7	34.8	34.5	18.0
Max Q Clear Time (g_c+I1), s	20.5	32.0	15.8	25.5	15.3	36.8	35.8	16.4
Green Ext Time (p_c), s	0.0	0.0	0.9	0.9	0.0	0.0	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	55.6
HCM 6th LOS	E



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1600	1900	1900	1700	1900	1900	1700	1900	1900	1700	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	50		50	190		235	585		150	500		50
Storage Lanes	3		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.94	1.00	1.00	0.97	0.95	1.00	0.97	0.86	1.00	0.97	0.86	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	4202	1863	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	4202	1863	1583	3072	3539	1583	3072	6408	1583	3072	6408	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			155			125			55
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		411			496			902			1114	
Travel Time (s)		9.3			11.3			20.5			25.3	

Intersection Summary	
Area Type:	Other



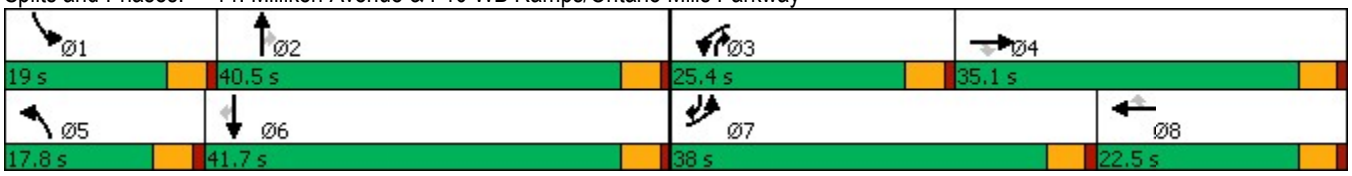
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	941	320	182	388	484	144	294	1907	589	427	1489	1117
Future Volume (vph)	941	320	182	388	484	144	294	1907	589	427	1489	1117
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1012	344	196	417	520	155	316	2051	633	459	1601	1201
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1012	344	196	417	520	155	316	2051	633	459	1601	1201

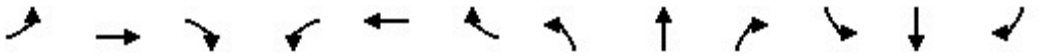
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	941	320	182	388	484	144	294	1907	589	427	1489	1117
Future Volume (vph)	941	320	182	388	484	144	294	1907	589	427	1489	1117
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	38.0	35.1	35.1	25.4	22.5	22.5	17.8	40.5	25.4	19.0	41.7	38.0
Total Split (%)	31.7%	29.3%	29.3%	21.2%	18.8%	18.8%	14.8%	33.8%	21.2%	15.8%	34.8%	31.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	33.5	31.5	31.5	20.0	18.0	18.0	13.3	36.0	60.5	14.5	37.2	75.2
Actuated g/C Ratio	0.28	0.26	0.26	0.17	0.15	0.15	0.11	0.30	0.50	0.12	0.31	0.63
v/c Ratio	0.86	0.70	0.40	0.81	0.98	0.42	0.93	1.07	0.74	1.24	0.81	1.19
Control Delay	49.9	49.3	21.5	61.7	85.8	10.7	87.0	81.6	24.4	171.6	41.9	117.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.9	49.3	21.5	61.7	85.8	10.7	87.0	81.6	24.4	171.6	41.9	117.1
LOS	D	D	C	E	F	B	F	F	C	F	D	F
Approach Delay		46.2			65.9			70.1			87.9	
Approach LOS		D			E			E			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.24	
Intersection Signal Delay: 71.9	Intersection LOS: E
Intersection Capacity Utilization 103.2%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 14: Milliken Avenue & I-10 WB Ramps/Ontario Mills Parkway





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1012	344	196	417	520	155	316	2051	633	459	1601	1201
v/c Ratio	0.86	0.70	0.40	0.81	0.98	0.42	0.93	1.07	0.74	1.24	0.81	1.19
Control Delay	49.9	49.3	21.5	61.7	85.8	10.7	87.0	81.6	24.4	171.6	41.9	117.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.9	49.3	21.5	61.7	85.8	10.7	87.0	81.6	24.4	171.6	41.9	117.1
Queue Length 50th (ft)	264	245	63	160	213	0	126	~510	301	~227	330	~1108
Queue Length 95th (ft)	321	354	133	#222	#328	60	#214	#586	454	#333	378	#1372
Internal Link Dist (ft)		331			416			822			1034	
Turn Bay Length (ft)	50		50	190		235	585		150	500		50
Base Capacity (vph)	1173	489	485	535	530	369	340	1922	871	371	1986	1012
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.70	0.40	0.78	0.98	0.42	0.93	1.07	0.73	1.24	0.81	1.19

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	941	320	182	388	484	144	294	1907	589	427	1489	1117
Future Volume (veh/h)	941	320	182	388	484	144	294	1907	589	427	1489	1117
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1575	1870	1870	1673	1870	1870	1673	1870	1870	1673	1870	1870
Adj Flow Rate, veh/h	1012	344	196	417	520	155	316	2051	633	459	1601	1201
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1116	493	418	475	544	243	350	1971	729	382	2037	920
Arrive On Green	0.26	0.26	0.26	0.15	0.15	0.15	0.11	0.31	0.31	0.12	0.32	0.32
Sat Flow, veh/h	4230	1870	1585	3092	3554	1585	3092	6434	1585	3092	6434	1585
Grp Volume(v), veh/h	1012	344	196	417	520	155	316	2051	633	459	1601	1201
Grp Sat Flow(s),veh/h/ln	1410	1870	1585	1546	1777	1585	1546	1609	1585	1546	1609	1585
Q Serve(g_s), s	27.2	19.5	12.2	15.5	17.1	10.8	11.9	36.0	36.0	14.5	26.6	37.2
Cycle Q Clear(g_c), s	27.2	19.5	12.2	15.5	17.1	10.8	11.9	36.0	36.0	14.5	26.6	37.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1116	493	418	475	544	243	350	1971	729	382	2037	920
V/C Ratio(X)	0.91	0.70	0.47	0.88	0.96	0.64	0.90	1.04	0.87	1.20	0.79	1.31
Avail Cap(c_a), veh/h	1206	493	418	550	544	243	350	1971	729	382	2037	920
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.9	39.1	36.4	48.7	49.4	46.7	51.5	40.8	28.5	51.5	36.5	24.6
Incr Delay (d2), s/veh	9.6	4.3	0.8	13.6	27.6	5.5	25.6	31.7	10.9	113.8	2.1	145.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.4	9.5	4.8	6.9	9.6	4.6	5.8	18.4	17.7	11.6	10.6	60.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.4	43.4	37.2	62.3	77.0	52.2	77.0	72.4	39.4	165.3	38.6	170.0
LnGrp LOS	D	D	D	E	E	D	E	F	D	F	D	F
Approach Vol, veh/h		1552			1092			3000			3261	
Approach Delay, s/veh		47.8			67.8			66.0			104.8	
Approach LOS		D			E			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	40.5	22.5	35.5	17.8	41.7	35.5	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	36.0	20.9	30.6	13.3	37.2	33.5	18.0
Max Q Clear Time (g_c+I1), s	16.5	38.0	17.5	21.5	13.9	39.2	29.2	19.1
Green Ext Time (p_c), s	0.0	0.0	0.5	1.9	0.0	0.0	1.8	0.0

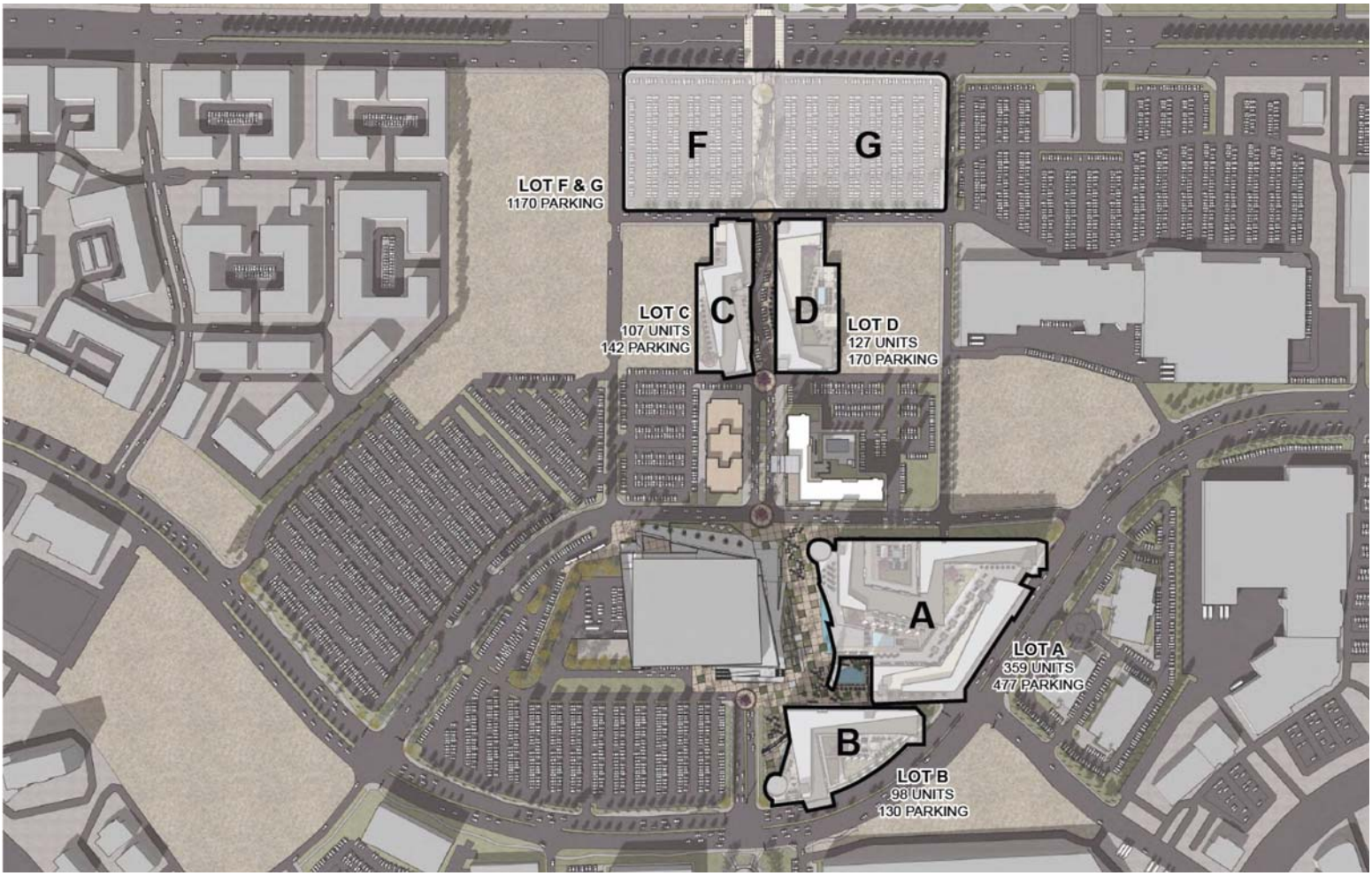
Intersection Summary	
HCM 6th Ctrl Delay	77.3
HCM 6th LOS	E

Notes

User approved changes to right turn type.

APPENDIX B
AIR QUALITY AND GREENHOUSE GAS IMPACT STUDY

TOYOTA ARENA MIXED-USE DEVELOPMENT
AIR QUALITY AND GREENHOUSE GAS IMPACT STUDY
City of Ontario



TOYOTA ARENA MIXED-USE DEVELOPMENT
AIR QUALITY AND GREENHOUSE GAS IMPACT STUDY
City of Ontario, California

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1.0 Introduction

The purpose of this air quality and greenhouse gas (GHG) impact study is to determine whether the estimated criteria air pollutants and greenhouse gas emissions generated from the construction and operation of the proposed Toyota Arena Mixed-Use Development (hereinafter referred to as project) would cause significant impacts to air resources.

This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.). The methodology follows the California Air Resources Board (CARB), the South Coast Air Quality Management District (SCAQMD), and City of Ontario recommendations for quantification of emissions and evaluation of potential impacts.

1.1 Site Location

The proposed project site is located adjacent to the Toyota Arena, north of Concourse Street and south of Fourth Street, in the City of Ontario.

The project site is located within the South Coast Air Basin (SCAB), the SCAQMD San Bernardino Valley General Forecast Area, and the Southwest San Bernardino Valley Air Monitoring Area-33.

The project site is located within the Ontario Center Specific Plan and zoned for Urban Commercial use. The City of Ontario General Plan land use map designates the project site as Mixed Use.

The project location map is provided in Exhibit A.

1.2 Project Description

The project consists of construction and operation of a mixed use town center development with residential and commercial/retail land use within four development lots.

The proposed project includes a total of 691 residential dwelling units, 71,200 square feet of commercial/retail uses and the demolition and relocation of approximately 1,170 surface parking spaces. The total project site area is approximately 18.73 acres.

The site plan used for this analysis, provided by the applicant, is illustrated in Exhibit B. Table 1 summarizes the land use assumptions used for this analysis.

Table 1
Land Use Summary

Lot	Dwelling Units	Retail (SF)[1]	Parking Spaces
A	359	25,256	477[2]
B	98	20,802	130[2]
C	107	11,047	142[2]
D	127	14,095	170[2]
E & F	--	--	1,170
Total	691	71,200	2,089

[1] S.F. – Square Feet
[2] Parking Structure

Construction of the project is estimated to begin in the year 2021 and last approximately 21 months. Construction activities are expected to consist of demolition, site preparation, grading, building construction, paving, and architectural coating. The project is expected to demolish an existing asphalt surface parking lot of approximately 7.48 acres within Lot A and Lot B.

The project is not expected to require the import or export of earthwork materials; preliminary grading estimates show a balanced site. The project is expected to be operational in the year 2023.

1.3 Sensitive Receptors

Sensitive receptors are considered land uses or other types of population groups that are more sensitive to air pollution exposure. Sensitive population groups include children, the elderly, the acutely and chronically ill, and those with cardio-respiratory diseases. For CEQA purposes, the SCAQMD considers a sensitive receptor to be a location where a sensitive individual could remain for 24-hours or longer, such as residences, hospitals, and schools (etc), as described in the Localized Significance Threshold Methodology (SCAQMD 2008a, page 3-2).

The nearest sensitive land uses to the project site include the following:

- Existing residential dwelling units located approximately 150 feet north of Lot G, across Fourth Street.

- Existing residential dwelling units located approximately 475 feet to the west of Lot F.

1.4 Summary of Air Quality and Greenhouse Gas Impacts

Table 2 provides a summary of the CEQA air quality impact analysis results.

Table 2
CEQA Air Quality Impact Criteria

Air Quality Impact Criteria	Potentially Significant	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with, or obstruct implementation of, the applicable air quality plan?			**X**	
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable Federal or State ambient air quality standard?			X	
d) Expose sensitive receptors to substantial pollutant concentrations?			**X**	
e) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?			**X**	

Table 3 provides a summary of the CEQA GHG impact criteria analysis results.

Table 3
CEQA GHG Impact Criteria

GHG Impact Criteria	Potentially Significant	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of greenhouse gases?			X	

1.5 Recommended Design Features

This section provides a summary of the recommended design features that are expected to be included as part of the project description and design and have been identified to help reduce the project's impact from air quality and GHG emissions. The recommended project design features include several standard rules and requirements, best practices, and common project design features for reducing air quality emissions.

Construction Design Features:

DF-1 Prepare and implement a Construction Management Plan which will include Best Available Control Measures to be submitted to the City of Ontario.

DF-2 Follow the standard SCAQMD rules and requirements with regards to fugitive dust control, which includes, but are not limited to the following:

1. All active construction areas shall be watered two (2) times daily.
2. Speed on unpaved roads shall be reduced to less than 15 mph.
3. Any visible dirt deposition on any public roadway shall be swept or washed at the site access points within 30 minutes.
4. Any on-site stockpiles of debris, dirt or other dusty material shall be covered or watered twice daily.
5. All operations on any unpaved surface shall be suspended if winds exceed 15 mph.
6. Access points shall be washed or swept daily.
7. Construction sites shall be sandbagged for erosion control.

8. Apply nontoxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for 10 days or more).
9. Cover all trucks hauling dirt, sand, soil, or other loose materials, and maintain at least 2 feet of freeboard space in accordance with the requirements of California Vehicle Code (CVC) section 23114.
10. Pave or gravel construction access roads at least 100 feet onto the site from the main road and use gravel aprons at truck exits.
11. Replace the ground cover of disturbed areas as quickly possible.
12. A fugitive dust control plan should be prepared and submitted to SCAQMD prior to the start of construction.

DF-3 All diesel construction equipment shall have Tier 4 low emission "clean diesel" engines (OEM or retrofit) that include diesel oxidation catalysts and diesel particulate filters that meet the latest CARB best available control technology.

DF-4 Construction equipment shall be maintained in proper tune.

DF-5 All construction vehicles shall be prohibited from excessive idling. Excessive idling is defined as five (5) minutes or longer.

DF-6 Minimize the simultaneous operation of multiple construction equipment units.

DF-7 The use of heavy construction equipment and earthmoving activity shall be suspended during Air Alerts when the Air Quality Index reaches the "Unhealthy" level.

DF-8 Establish an electricity supply to the construction site and use electric powered equipment instead of diesel-powered equipment or generators, where feasible.

DF-9 Utilize zero VOC and low VOC paints and solvents, wherever possible.

Operational Design Features:

DF-10 Implement the GHG Reduction Measures from the Ontario County Climate Action Plan (CAP) Screening Tables to achieve at least 100 points, per the requirements for Mixed Use Projects.

DF-11 Comply with the mandatory requirements of California Building Standards Code Title 24 Part 6 (Energy Code) and Title 24 Part 11 (CAL Green).

DF-12 Implement water conservation strategies, including low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and limit the amount of turf/sod, per CAL Green and City of Ontario requirements.

DF-13 Implement zero waste strategies, recycling and composting programs for residential and non-residential uses.

DF-14 Encourage residents and landscape maintenance crews to use electric landscaping equipment, such as lawn mowers and leaf blowers, wherever feasible.

DF-15 No natural gas or wood burning fireplaces shall be installed in any residential dwelling.

DF-16 Implement trip reduction measures that reduce the number of auto-based trips and encourage the use of transit, bicycling, and walking. Such as;

1. Improve the walkability and design of the project by including pedestrian and bicycling connections within the project site and to adjacent off-site facilities (i.e. sidewalks, crosswalks, foot paths, protected bike lanes, multi-purpose trails, direct parcel-to-parcel connections, wayfinding signage, etc.).

2. Provide traffic calming measures (i.e. marked crosswalks, raised crosswalks, raised intersections, count-down signal timers, curb extensions, speed tables, median islands, tight corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, etc.)

3. Provide bicycle racks for the retail and commercial uses and secure bicycle parking areas for the office and residential uses.

DF-17 Provide electric vehicle charging stations per the requirements of CALGreen.

2.0 Air Quality Setting

The Federal Clean Air Act (§ 7602) defines air pollution as any agent or combination of such agents, including any physical, chemical, biological, or radioactive substance which is emitted into or otherwise enters the ambient air. Household combustion devices, motor vehicles, industrial facilities and forest fires are common sources of air pollution. Air pollution can cause disease, allergies and even death. It affects soil, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility, and climate. It can also cause damage to and deterioration of property, present hazards to transportation, and negatively impact the economy.

This section provides background information on criteria air pollutants, the applicable federal, state and local regulations concerning air pollution, and the existing physical setting of the project within the context of local air quality.

2.1 Description of Air Pollutants[1].

The following section describes the air pollutants of concern related to the project. Criteria air pollutants are defined as those pollutants for which the federal and state governments have established air quality standards for outdoor or ambient concentrations to protect public health. The following descriptions of criteria air pollutants have been provided by the SCAQMD.

- **Carbon Monoxide (CO)** is a colorless, odorless, toxic gas produced by incomplete combustion of carbon-containing fuels (e.g., gasoline, diesel fuel, and biomass). Sources include motor vehicle exhaust, industrial processes (metals processing and chemical manufacturing), residential wood burning, and natural sources. CO is somewhat soluble in water; therefore, rainfall and fog can suppress CO conditions. CO enters the body through the lungs, dissolves in the blood, and competes with oxygen, often replacing it in the blood, thus reducing the blood's ability to transport oxygen to vital organs in the body. The ambient air quality standard for carbon monoxide is intended to protect persons whose medical condition already compromises their circulatory system's ability to deliver oxygen. These medical conditions include certain heart ailments, chronic lung diseases, and anemia. Persons with these conditions have reduced exercise capacity even when exposed to relatively low levels of CO. Fetuses are at risk because their blood has an even greater affinity to bind with CO. Smokers are also at risk from ambient CO levels because smoking

[1] SCAQMD. Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning (May 6, 2005)

increases the background level of CO in their blood. The South Coast basin has recently achieved attainment status for carbon monoxide by both USEPA and CARB.

- **Nitrogen Dioxide (NO_2)** is a byproduct of fuel combustion. The principal form of nitrogen oxide produced by combustion is nitric oxide (NO), but NO reacts quickly to form NO_2, creating the mixture of NO and NO_2 commonly called NO_x. NO_2 acts as an acute irritant and, in equal concentrations, is more injurious than NO. At atmospheric concentrations, however, NO_2 is only potentially irritating. There is some indication of a relationship between NO_2 and chronic pulmonary fibrosis. Some increase in bronchitis in young children has also been observed at concentrations below 0.3 parts per million (ppm). NO_2 absorbs blue light which results in a brownish red cast to the atmosphere and reduced visibility. Although NO_2 concentrations have not exceeded national standards since 1991 and the state hourly standard since 1993, NO_x emissions remain of concern because of their contribution to the formation of O_3 and particulate matter.

- **Ozone (O_3)** is one of several substances called photochemical oxidants that are formed when volatile organic compounds (VOC) and NO_x react in the presence of ultraviolet sunlight. O_3 concentrations in the South Coast basin are typically among the highest in the nation, and the damaging effects of photochemical smog, which is a popular name for a number of oxidants in combination, are generally related to the concentrations of O_3. Individuals exercising outdoors, children, and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the subgroups most susceptible to O_3 effects. Short-term exposures (lasting for a few hours) to O_3 at levels typically observed in southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. In recent years, a correlation between elevated ambient O_3 levels and increases in daily hospital admission rates, as well as mortality, has also been reported. The South Coast Air Basin is designated by the USEPA as an extreme non-attainment area for ozone. Although O_3 concentrations have declined substantially since the early 1990s, the South Coast basin continues to have peak O_3 levels that exceed both state and federal standards.

- **Fine Particulate Matter (PM_{10})** consists of extremely small, suspended particles or droplets 10 microns or smaller in diameter that can lodge in the lungs, contributing to respiratory problems. PM_{10} arises from such sources as re-entrained road dust, diesel soot, combustion products, tire and brake abrasion, construction operations, and fires. It is also formed in the atmosphere from NO_x and SO_2 reactions with ammonia. PM_{10} scatters light and significantly reduces visibility. Inhalable particulates

pose a serious health hazard, alone or in combination with other pollutants. More than half of the smallest particles inhaled will be deposited in the lungs and can cause permanent lung damage. Inhalable particulates can also have a damaging effect on health by interfering with the body's mechanism for clearing the respiratory tract or by acting as a carrier of an absorbed toxic substance. The South Coast basin has recently achieved federal attainment status for PM_{10}, but is non-attainment based on state requirements.

- **Ultra-Fine Particulate Matter ($PM_{2.5}$)** is defined as particulate matter with a diameter less than 2.5 microns and is a subset of PM_{10}. $PM_{2.5}$ consists mostly of products from the reaction of NO_x and SO_2 with ammonia, secondary organics, finer dust particles, and the combustion of fuels, including diesel soot. $PM_{2.5}$ can cause exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease, declines in pulmonary function growth in children, and increased risk of premature death from heart or lung diseases in the elderly. Daily fluctuations in $PM_{2.5}$ levels have been related to hospital admissions for acute respiratory conditions, school absences, and increased medication use in children and adults with asthma. The South Coast basin is designated as non-attainment for $PM_{2.5}$ by both federal and state standards.

- **Sulfur dioxide (SO_2)** is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. Health effects include acute respiratory symptoms and difficulty in breathing for children. Individuals with asthma may experience constriction of airways with exposure to SO_2. Though SO_2 concentrations have been reduced to levels well below state and federal standards, further reductions in SO_2 emissions are needed because SO_2 is a precursor to sulfate and PM_{10}. The South Coast basin is considered a SO_2 attainment area by USEPA and CARB.

- **Lead (Pb)** is a toxic heavy metal that can be emitted into the air through some industrial processes, burning of leaded gasoline and past use of lead-based consumer products. Lead is a neurotoxin that accumulates in soft tissues and bones, damages the nervous system, and causes blood disorders. It is particularly problematic in children, in that permanent brain damage may result, even if blood levels are promptly normalized with treatment. Concentrations of lead once exceeded the state and federal air quality standards by a wide margin, but as a result of the removal of lead from motor vehicle gasoline, ambient air quality standards for lead have not been exceeded since 1982. Though special monitoring sites immediately downwind of lead sources recorded localized violations of the state standard in 1994, no violations have been recorded since. Consequently, the South Coast basin is designated as an attainment area for lead by both the USEPA and CARB. This report

does not analyze lead emissions from the project, as it is not expected to emit lead in any significant measurable quantity.

- **Volatile Organic Compounds (VOC),** although not actually a criteria air pollutant, VOCs are regulated by the SCAQMD because they cause chemical reactions which contribute to the formation of ozone. VOCs are also transformed into organic aerosols in the atmosphere, contributing to higher PM_{10} and lower visibility levels. Sources of VOCs include combustion engines, and evaporative emissions associated with fuel, paints and solvents, asphalt paving, and the use of household consumer products such as aerosols. Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations of VOC. Some hydrocarbon components classified as VOC emissions are hazardous air pollutants. Benzene, for example, is a hydrocarbon component of VOC emissions that are known to be a human carcinogen. The term reactive organic gases (ROG) are often used interchangeably with VOC.

- **Toxic Air Contaminants (TACs)** are defined as air pollutants which may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health, and for which there is no concentration that does not present some risk. This contrasts with the criteria pollutants, in that there is no threshold level for TAC exposure below which adverse health impacts are not expected to occur. The majority of the estimated health risk from TACs can be attributed to a relatively few compounds, the most common being diesel particulate matter (DPM) from diesel engine exhaust. In addition to DPM, benzene and 1,3-butadiene are also significant contributors to overall ambient public health risk in California.

2.2 Federal and State Ambient Air Quality Standards

The Federal Clean Air Act, which was last amended in 1990, requires the EPA to set National Ambient Air Quality Standards (NAAQS) for criteria pollutants considered harmful to public health and the environment. The State of California has also established additional and more stringent California Ambient Air Quality Standards (CAAQS) in addition to the seven criteria pollutants designated by the federal government.

AAQS are designed to protect the health and welfare of the populace with a reasonable margin of safety. The standards are divided into two categories, primary standards, and secondary standards. Primary standards are implemented to provide protection for the "sensitive" populations such as those with asthma, or the children and elderly. Secondary standards are to provide protection against visible pollution as well as damage to the surrounding environment, including animals, crops, and buildings.

Table 4 shows the Federal and State Ambient Air Quality Standards.

Table 4
Federal and State Ambient Air Quality Standards (AAQS)[1]

Air Pollutant	Averaging Time [2]	Federal Standard (NAAQS)[2]	California Standard (CAAQS)[2]
Ozone	1 Hour	--	0.09 ppm
	8 Hour	0.070 ppm	0.070 ppm
Carbon Monoxide (CO)	1 Hour	35 ppm	20 ppm
	8 Hour	9 ppm	9 ppm
Nitrogen Dioxide (NO_2)	1 Hour	0.100 ppm	0.18 ppm
	Annual	0.053 ppm	0.030 ppm
Sulfur Dioxide (SO_2)	1 Hour	0.075 ppm	0.25 ppm
	3 Hour	0.5 ppm[3]	--
	24 Hour	--	0.04 ppm
Particulate Matter (PM_{10})	24 Hour	150 μg/m^3	50 μg/m^3
	Mean	--	20 μg/m^3
Particulate Matter (PM2.5)	24 Hour	35 μg/m^3	--
	Annual	12 μg/m^3	12 μg/m^3
Lead	30-day	--	1.5 μg/m
	Quarter	1.5 μg/m	--
	3-month average	0.15 μg/m	--
Visibility reducing particles	8 Hour	--	0.23/km extinction coefficient. (10-mile visibility standard)
Sulfates	24 Hour	--	25 μg/m
Vinyl chloride	24 Hour	--	0.01 ppm
Hydrogen sulfide	24 Hour	--	0.03 ppm

[1] Source: USEPA: https://www.epa.gov/criteria-air-pollutants/naaqs-table and
CARB: https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards

[2] ppm = parts per million of air, by volume; µg/m3 = micrograms per cubic meter; Annual = Annual Arithmetic Mean; 30-day = 30-day average; Quarter = Calendar quarter.

[3] Secondary standards

Several pollutants listed in Table 4 are not addressed in this analysis. Lead is not included because the project is not anticipated to emit lead. Visibility-reducing particles are not explicitly addressed in this analysis because particulate matter is addressed. The project is not expected to generate or be exposed to vinyl chloride because proposed project uses do not utilize the chemical processes that create this pollutant and there are no such uses in the project vicinity. The proposed project is not expected to cause exposure to hydrogen sulfide because it would not generate hydrogen sulfide in any substantial quantity.

2.3 Attainment Status

The Clean Air Act requires states to prepare a State Implementation Plan (SIP) to ensure air quality meets the NAAQS. The California Air Resources Board (CARB) provides designations of attainment for air basins where AAQS are either met or exceeded. If the AAQS are met, the area is designated as being in "attainment", if the air pollutant concentrations exceed the AAQS, than the area is designated as being "nonattainment". If there is inadequate or inconclusive data to make a definitive attainment designation, the area is considered "unclassified."

National nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards. Each standard has a different definition, or 'form' of what constitutes attainment, based on specific air quality statistics. For example, the Federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the federal annual $PM_{2.5}$ standard is met if the three-year average of the annual average $PM_{2.5}$ concentration is less than or equal to the standard.

When a state submits a request to the EPA to re-designate a nonattainment area to attainment, the Clean Air Act (CAA) section 175A(a) requires that the state (or states, if the area is a multi-state area) submit a maintenance plan ensuring the area can maintain the air quality standard for which the area is to be re-designated for at least 10 years following the effective date of re-designation.

Table 5 lists the attainment status for the criteria pollutants in the South Coast Air Basin (SCAB).

Table 5
South Coast Air Basin Attainment Status[1]

Pollutant	State Status	National Status
Ozone	Nonattainment	Nonattainment (Extreme)[2]
Carbon monoxide	Attainment	Attainment (Maintenance)
Nitrogen dioxide	Attainment	Attainment (Maintenance)
PM_{10}	Nonattainment	Attainment (Maintenance)
$PM_{2.5}$	Nonattainment	Nonattainment
Lead	Attainment	Nonattainment (Partial)[3]

[1] Source: California Air Resources Board. http://www.arb.ca.gov/desig/adm/adm.htm
[2] 8-Hour Ozone.
[3] Partial Nonattainment designation – Los Angeles County portion of Basin only.

2.4 South Coast Air Quality Management District (SCAQMD)

The agency responsible for air pollution control for the South Coast Air Basin (SCAB) is the South Coast Air Quality Management District (SCAQMD). SCAQMD is responsible for controlling emissions primarily from stationary sources. SCAQMD maintains air quality monitoring stations throughout the SCAB. SCAQMD, in coordination with the Southern California Association of Governments, is also responsible for developing, updating, and implementing the Air Quality Management Plan (AQMP) for the SCAB. An AQMP is a plan prepared and implemented by an air pollution district for a county or region designated as nonattainment of the federal and/or California ambient air quality standards. The term nonattainment area is used to refer to an air SCAB where one or more ambient air quality standards are exceeded.

The latest version is the 2016 AQMP. The 2016 AQMP is a regional blueprint for achieving the federal air quality standards and healthful air. While air quality has dramatically improved over the years, the SCAB still exceeds federal public health standards for both ozone and particulate matter (PM) and experiences some of the worst air pollution in the nation. The 2016 AQMP includes both stationary and mobile source strategies to ensure that rapidly approaching attainment deadlines are met, that public health is protected to the maximum extent feasible, and that the region is not faced with burdensome sanctions if the Plan is not approved or if the NAAQS are not met on time.

According to the 2016 AQMP, the most significant air quality challenge in the SCAB is to reduce nitrogen oxide (NOx) emissions sufficiently to meet the upcoming ozone standard deadlines. Based on the inventory and modeling results, 522 tons per day (tpd) of total

SCAB NOx 2012 emissions are projected to drop to 255 tpd and 214 tpd in the 8-hour ozone attainment years of 2023 and 2031 respectively, due to continued implementation of already adopted regulatory actions ("baseline emissions"). The analysis suggests that total SCAB emissions of NOx must be reduced to approximately 141 tpd in 2023 and 96 tpd in 2031 to attain the 8-hour ozone standards. This represents an additional 45 percent reduction in NOx in 2023, and an additional 55 percent NOx reduction beyond 2031 levels.[2]

2.4.1 SCAQMD Rules and Regulations

The SCAQMD establishes a program of rules and regulations to obtain attainment of the state and federal standards in conjunction with the AQMP. Several of the rules and regulations that may be applicable to this project include, but are not limited to, the following:

- **SCAQMD Rule 402** prohibits a person from discharging from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

- **SCAQMD Rule 403** governs emissions of fugitive dust during construction and operation activities. Compliance with this rule is achieved through application of standard Best Management Practices, such as application of water or chemical stabilizers to disturbed soils, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 miles per hour, sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph, and establishing a permanent ground cover on finished sites.

- **SCAQMD Rule 445** restricts wood burning devices from being installed into any new development and is intended to reduce the emissions of particulate matter for wood burning devices.

- **SCAQMD Rule 1113** governs the sale, use, and manufacturing of architectural coating and limits the VOC content in paints and paint solvents. This rule regulates the VOC content of paints available during construction. Therefore, all paints and

[2] SCAQMD. Final 2016 Air Quality Management Plan. http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp

solvents used during construction and operation of project must comply with Rule 1113.

- **SCAQMD Rule 1143** governs the manufacture, sale, and use of paint thinners and solvents used in thinning of coating materials, cleaning of coating application equipment, and other solvent cleaning operations by limiting their VOC content. This rule regulates the VOC content of solvents used during construction. Solvents used during the construction phase must comply with this rule.

- **SCAQMD Rule 1186** limits the presence of fugitive dust on paved and unpaved roads and sets certification protocols and requirements for street sweepers that are under contract to provide sweeping services to any federal, state, county, agency or special district such as water, air, sanitation, transit, or school district.

2.5 Local Climate and Meteorology

The project is located in the South Coast Air Basin (SCAB). Climatological data from the nearest weather station to the project site is summarized in Table 6.

Table 6
Meteorological Summary[1]

Month	Temperature (˚F)			Mean Precipitation (inches)
	Max.	Min.	Mean	
January	66.8	44.0	55.5	3.65
February	69.4	45.0	57.2	2.85
March	70.1	46.3	58.2	2.80
April	74.5	48.4	61.5	1.13
May	79.9	52.6	66.2	0.26
June	86.7	56.6	71.7	0.04
July	95.0	62.2	78.6	0.01
August	94.4	62.9	78.7	0.11
September	91.3	61.3	76.3	0.34
October	83.0	55.4	69.2	0.34
November	73.6	48.5	61.0	1.72
December	68.3	44.4	56.3	2.07
Annual	**79.4**	**52.3**	**65.9**	**15.32**

[1] Source: Western Regional Climate Center 2012. Averages derived from measurements recorded from 1951 to 1984 at Fontana Kaiser Station No. 043120.

2.6 Local Air Quality

The air quality at any site is dependent on the regional air quality and local pollutant sources. Regional air quality is determined by the release of pollutants throughout the air basin. Estimates of the existing emissions in the Basin provided in the Final 2016 Air Quality Management Plan, prepared by SCAQMD, March 2017, indicate that collectively, mobile sources account for 60 percent of the VOC, 90 percent of the NOx emissions, 95 percent of the CO emissions and 34 percent of directly emitted PM2.5, with another 13 percent of PM2.5 from road dust.

The SCAQMD has divided the SCAB into fourteen general forecasting areas and thirty eight Source Receptor Areas (SRA) for monitoring and reporting local air quality. The SCAQMD provides daily reports of the current air quality conditions in each general forecast area and SRA. The monitoring areas provide a general representation of the local meteorological, terrain, and air quality conditions within the SCAB.

The project is located within the San Bernardino Valley general forecasting area and Southwest San Bernardino Valley (SRA-33). The Southwest San Bernardino Valley has been divided into two (2) regions; I-10 Near Road and CA-60 Near Road. Due to the close proximity of the project site to the I-10 Road, published air quality monitoring data has been used from this location.

Table 7 summarizes the published air quality monitoring for the most recent 3-year period available. These pollutant levels were used to comprise a "background" for the project location and existing local air quality. For criteria pollutants not monitored near the site, data from the nearest monitoring station with a comparable setting were used.

Table 7
Local Air Quality

Air Pollutant Location	Averaging Time	Item	2017	2018	2019
Carbon Monoxide -- I-10 Near Road	1 Hour	Max 1-Hour (ppm)	4.2	1.6	1.5
		Exceeded State Standard (20 ppm)	No	No	No
		Exceeded National Standard (35 ppm)	No	No	No
	8 Hour	Max 8 Hour (ppm)	1.3	1.3	1.1
		Exceeded State Standard (9 ppm)	No	No	No
		Exceeded National Standard (9 ppm)	No	No	No
Ozone -- Central San Bernardino Valley-1	1 Hour	Max 1-Hour (ppm)	0.137	0.141	0.124
		Days > State Standard (0.09 ppm)	33	38	41
	8 Hour	Max 8 Hour (ppm)	0.118	0.116	0.114
		Days > State Standard (0.07 ppm)	49	69	67
		Days >National Standard (0.070 ppm)	49	69	67
Nitrogen Dioxide -- I-10 Near Road	1 Hour	Max 1-Hour (ppm)	0.086	0.0883	0.0863
		Exceeded State Standard (0.18 ppm)	No	No	No
	Annual	Annual Average (ppm)	0.0288	0.0272	0.0276
		Exceeded >State Standard (0.030 ppm)	No	No	No
		Exceeded >National Standard (0.053 ppm)	No	No	No
Sulfur Dioxide -- Central San Bernardino Valley-1	1 Hour	Max 1 Hour (ppm)	0.0039	0.0029	0.0024
		Exceed State Standard (0.25 ppm)	No	No	No
		Exceed National Standard (0.075 ppm)	No	No	No
Coarse Particles (PM10) -- Central San Bernardino Valley-1	24 Hour	Max 24-Hour ($\mu g/m^3$)	75	64	88
		Days > State Standard (50 $\mu g/m^3$)	2	9	12
		Days >National Standard (150 $\mu g/m^3$)	0	0	0
	Annual	Annual Average ($\mu g/m^3$)	39.3	34.1	34.8
		Exceeded State Standard (20 $\mu g/m^3$)	Yes	Yes	Yes
Fine Particulates (PM2.5) -- Central San Bernardino Valley-1	24 Hour	Max 24-Hour ($\mu g/m^3$)	39.2	29.2	46.5
		Days >National Standard (35 $\mu g/m^3$)	1	0	2
	Annual	Annual Average ($\mu g/m^3$)	12.04	11.13	10.84
		Exceeded State Standard (12 $\mu g/m^3$)	No	No	No
		Exceeded National Standard (15 $\mu g/m^3$)	No	No	No

Source : https://www.aqmd.gov/home/air-quality/historical-air-quality-data/historical-data-by-year
$\mu g/m^3$ = micrograms per cubic meter
ARB = California Air Resource Board
EPA= Environmental Protection Agency
ppm = part per million
(- -) = Data not provided

3.0 Global Climate Change Setting

Global climate change is the change in the average weather of the earth that is measured by such things as alterations in temperature, wind patterns, storms, and precipitation. Current data shows that the recent period of warming is occurring more rapidly than past geological events. The average global surface temperature has increased by approximately 1.4° Fahrenheit since the early 20th Century. 1.4° Fahrenheit may seem like a small change, but it's an unusual event in Earth's recent history, and as we are seeing, even small changes in temperature can cause enormous changes in the environment.

The planet's climate record, preserved in tree rings, ice cores, and coral reefs, shows that the global average temperature has been stable over long periods of time. For example, at the end of the last ice age, when the Northeast United States was covered by more than 3,000 feet of ice, average global temperatures were only 5° to 9° Fahrenheit cooler than today. The Intergovernmental Panel on Climate Change (IPCC), which includes more than 1,300 scientists from the United States and other countries, forecasts a temperature rise of 2.5° to 10° Fahrenheit over the next century. Therefore, significant changes to the environment are expected in the near future.

The consequences of global climate change include more frequent and severe weather, worsening air pollution by increasing ground level ozone, higher rates of plant and animal extinction, more acidic and oxygen depleted oceans, strain on food and water resources, and threats to densely populated coastal and low lying areas from sea level rise.

The impacts of climate change are already visible in the Southwest United States. In California, the consequences of climate change include;

- A rise in sea levels resulting in the displacement of coastal businesses and residencies
- A reduction in the quality and supply of water from the Sierra snowpack
- Increased risk of large wildfires
- Exacerbation of air quality problems
- Reductions in the quality and quantity of agricultural products
- An increased temperature and extreme weather events
- A decrease in the health and productivity of California's forests

3.1 Greenhouse Gases

GHGs comprise less than 0.1 percent of the total atmospheric composition, yet they play an essential role in influencing climate. Greenhouse gases include naturally occurring compounds such as carbon dioxide (CO_2), methane (CH_4), water vapor (H_2O), and nitrous oxide (N_2O), while others are synthetic. Man-made GHGs include the chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs) and Perfluorocarbons (PFCs), as well as sulfur hexafluoride (SF_6). Different GHGs have different effects on the Earth's warming. GHGs differ from each other in their ability to absorb energy (their "radiative efficiency") and how long they stay in the atmosphere, also known as the "lifetime".

The Global Warming Potential (GWP) was developed to allow comparisons of the global warming impacts of different gases. Specifically, it is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of CO_2. The larger the GWP, the more that a given gas warms the Earth compared to CO_2 over that time period. The time period usually used for GWPs is 100 years. GWPs provide a common unit of measure, which allows analysts to add up emissions estimates of different gases and allows policymakers to compare emissions reduction opportunities across sectors and gases.

Table 8 lists the 100-year GWP of GHGs from the Intergovernmental Panel on Climate Change (IPCC) fifth assessment report (AR5).

Table 8
Global Warming Potential of Greenhouse Gases[1, 2]

Gas Name	Formula	Lifetime (years)	GWP
Carbon Dioxide	CO_2		1
Methane	CH_4	12	28
Nitrous Oxide	N_2O	114	265
Sulphur Hexafluoride	SF_6	3200	23,500
Nitrogen Trifluoride	NF_3	740	16,100
Hexafluoroethane (PFC-116)	C_2F_6	10,000	11,100
Octafluoropropane (PFC-218)	C_3F_8	2,600	8,900
Octafluorocyclobutane (PFC-318)	C_4F_8	3,200	9,540
Tetrafluoromethane (PFC-14)	CF_4	50,000	6,630
Hydrofluorocarbon 125	HFC-125	29	3,170
Hydrofluorocarbon 134a	HFC-134a	14	1,300
Hydrofluorocarbon 143a	HFC-143a	52	4,800
Hydrofluorocarbon 152a	HFC-152a	1	138
Hydrofluorocarbon 227ea	HFC-227ea	34	3,350
Hydrofluorocarbon 23	HFC-23	270	12,400
Hydrofluorocarbon 236fa	HFC-236fa	240	8,060
Hydrofluorocarbon 245fa	HFC-245fa	8	858
Hydrofluorocarbon 32	HFC-32	5	677
Hydrofluorocarbon 365mfc	HFC-365mfc	9	804
Hydrofluorocarbon 43-10mee	HFC-43-10mee	16	1,650

[1] Source: IPCC Fifth Assessment Report (AR5)
https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter08_FINAL.pdf
[2] GWPs are used to convert GHG emission values to "carbon dioxide equivalent" (CO_2e) units

3.2 GHG Regulatory Setting – State of California

The State of California has been a leader in climate change legislation and has passed numerous bills to reduce greenhouse gas emissions across all sectors of the economy. Some of the key climate legislation in the State include the following:

- **Assembly Bill (AB) 32, California Global Warming Solutions Act of 2006.** AB 32 set the stage for the State's transition to a sustainable, low-carbon future. AB 32 was the first program in the country to take a comprehensive, long-term approach to addressing climate change.[3]

- **Senate Bill (SB) 375, Sustainable Communities & Climate Protection Act of 2008.** SB 375 requires the Air Resources Board to develop regional greenhouse gas emission reduction targets for passenger vehicles GHG reduction targets for 2020 and 2035 for each region covered by the State's 18 metropolitan planning organizations.[4]

- **Senate Bill (SB) 100, California Renewables Portfolio Standard Program.** SB 100 established a landmark policy requiring renewable energy and zero-carbon resources supply 100 percent of electric retail sales to end-use customers by 2045.[5]

3.3 GHG Emissions Inventory

Table 9 shows the latest GHG emission inventories at the national, state, regional and local levels.

Table 9
GHG Emissions Inventory[1]

United States (2018)[2]	State of California (2018)[3]	SCAG (2020)[4]	City of Ontario (2020)[5]
6,678 $MMTCO_2e$	425 $MMTCO_2e$	216.4 $MMTCO_2e$	3.12 $MMTCO_2e$

[1] $MMTCO_2e$ = Million Metric Tons of Carbon Dioxide Equivalent
[2] https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks
[3] https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2018/ghg_inventory_trends_00-18.pdf
[4] http://www.scag.ca.gov/programs/Pages/GreenhouseGases.aspx
[5] City of Ontario Community Climate Action Plan, November 2014. Estimated value.

[3] California Air Resources Board. AB 32 Global Warming Solutions Act of 2006. https://ww2.arb.ca.gov/resources/fact-sheets/ab-32-global-warming-solutions-act-2006
[4] California Air Resources Board. Sustainable Communities and Climate Protection Program. https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-climate-protection-program/about
[5] California Energy Commission. SB 100 Joint Agency Report. https://www.energy.ca.gov/sb100

4.0 Modeling Parameters and Assumptions

The California Emissions Estimator Model Version 2020.4.0 (CalEEMod) was used to calculate criteria air pollutants and GHG emissions from the construction and operation of the project. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify criteria air pollutant and GHG emissions.

The model quantifies direct emissions from construction and operation activities (including vehicle use), as well as indirect emissions, such as GHG emissions from off-site energy generation, solid waste disposal, vegetation planting and/or removal, and water use. The model also identifies design features to reduce criteria pollutant and GHG emissions. The model was developed for the California Air Pollution Control Officers Association (CAPCOA) in collaboration with the California air districts.

4.1 Construction Assumptions

Construction of the project is estimated to begin in the year 2021 and last approximately 21 months. Construction activities are expected to consist of demolition, site preparation, grading, building construction, paving, and architectural coating. The project is expected to be operational in the year 2023. For purposes of this analysis, construction phases are not expected to overlap.

The project is expected to demolish an existing asphalt surface parking lot of approximately 7.48 acres within Lot A and Lot B. The project is not expected to require the import or export any earthwork material during grading phase; preliminary earthwork estimates show a balanced site.

Assumptions for off-road equipment usage, soil disturbance area, worker and vendor trips, paving, and architectural coatings utilize the CalEEMod defaults.

The project will be required to comply with several standard fugitive dust control measures, per SCAQMD Rule 403. The following key inputs are utilized in CalEEMod and are based upon data provided from SCAQMD[6]:

- Utilize soil stabilizers - 30% PM_{10} and $PM_{2.5}$ reduction.

[6] SCAQMD. Fugitive Dust Mitigation Measures. http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/mitigation-measures-and-control-efficiencies/fugitive-dust

- Replace ground cover - 15% PM_{10} and $PM_{2.5}$ reduction.
- Water exposed areas 2x per day.
- Unpaved road moisture content – 25%.
- Unpaved road vehicle speed – 15 mph.

4.2 Operational Assumptions

Operational emissions occur over the life of the project and are considered "long-term" sources of emissions. Operational emissions include both direct and indirect sources. This section briefly describes the operational sources of emissions analyzed for the project.

4.2.1 Mobile Source Emissions

Mobile source emissions are the largest source of long-term air pollutants from the operation of the project. Mobile sources are direct sources of project emissions that are primarily attributed to tailpipe exhaust and road dust (tire, brake, clutch, and road surface wear) from motor vehicles traveling to and from the site.

Estimates of mobile source emissions require information on four parameters: trip generation, trip length, vehicle/fleet mix, and emission factors (quantity of emission for each mile traveled or time spent idling by each vehicle).

The trip generation rates, trip length and trip percentages for this project are based on the latest version of the Toyota Arena Mixed Use Development Traffic Impact Study Scoping Agreement, by RK, May 2021 and San Bernardino County Transportation Authority (SBCTA) VMT Tool[7].

The Emission Factors (EMFAC2017) 2017 model and off-model adjustments factors to account for the SAFE Vehicle Rule is used to estimate the mobile source emissions are embedded in the CalEEMod emissions model. No adjustments have been made to default emission factors.

The project's total vehicle miles traveled estimated by CalEEMod is shown in the Table 10 for this project.

[7] SBCTA VMT Screening Tool. https://devapps.fehrandpeers.com/sbctavmt/

Table 10
Operational Vehicle Miles Traveled

Land Use	Annual Vehicle Miles Traveled (VMT)
Multifamily Mid-Rise[1]	5,682,657
Commercial/Retail Center	4,539,098
Total	**10,221,754**

[1] The VMT estimates for residential home-based trips are based on estimates from the SBCTA VMT Tool, which shows daily home-based VMT per capita for TAZ 53690101 of 7.9 VMT per population for model year 2023.

The operational vehicle fleet mix has been adjusted to reflect vehicle types used for typical residential home-based trips and the commercial/retail and office trips generated by the project. The Southern California Association of Governments (SCAG) regional travel demand model does not include heavy-duty trucks, buses or other large vehicles that would require passenger car equivalent (PCE) adjustments for residential home-based trips. The project does not consist of land uses that would typically require PCE adjustments to account for large trucks, such as warehousing.

To be conservative, the Air Quality/GHG analysis has assumed that 2% of the total residential home-based trips and commercial/retail and office trips will include trucks with a gross vehicle weight rating (GVWR) of 10,000 pound or greater. This includes LHD2, MHD, HHD, OBUS, UBUS, and SBUS vehicles. The 2% mix is also consistent with the default Highway Capacity Manual (HCM) assumptions. The adjusted vehicle mix is proportioned according to the default CalEEMod vehicle mix.

Table 11 summarizes vehicle mix used for this project.

Table 11
Vehicle Mix for Trips[1]

YUY	Vehicle Mix (%)
Light Duty Automobile (LDA)	55.05%
Light Duty Truck (LDTI)	5.72%
Light Duty Truck (LDT2)	17.64%
Medium Duty Truck (MDV)	14.23%
Light Heavy Truck (LHD1)	2.76%
Light Heavy Truck (LHD2)	0.34%
Medium Heavy Truck (MHD)	0.53%
Heavy Heavy Truck (HHD)	0.81%
Other Bus (OBUS)	0.03%
Urban Bus (UBUS)	0.01%
Motorcycle (MCY)	2.59%
School Bus (SBUS)	0.04%
Motor Home (MH)	0.24%
Total	**100.0%**

[1] Adjusted fleet mix to include 2% total trucks over 10,000 lbs GVWR. (LHD2, MHD, HHD, OBUS, UBUS, SBUS, MH)

5.0 Significance Thresholds

5.1 Air Quality Regional Significance Thresholds

The SCAQMD has established air quality emissions thresholds for criteria air pollutants for the purposes of determining whether a project may have a significant effect on the environment per Section 15002(g) of the Guidelines for implementing CEQA. By complying with the thresholds of significance, the project would be in compliance with the SCAQMD Air Quality Management Plan (AQMP) and the federal and state air quality standards.

Table 12 lists the air quality significance thresholds for the six air pollutants analyzed in this report. Lead is not included as part of this analysis as the project is not expected to emit lead in any significant measurable quantity.

Table 12
SCAQMD Regional Significance Air Quality Thresholds

Pollutant	Construction (lbs/day)	Operation (lbs/day)
NO_X	100	55
VOC	75	55
PM_{10}	150	150
$PM_{2.5}$	55	55
SO_X	150	150
CO	550	550

[1] Source: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf

5.2 City of Ontario General Plan

The City of Ontario describes several goals and policies for addressing air quality and greenhouse gas in the General Plan ER4 Air Quality. The following policy goals are aimed at providing guidance and policy direction in providing better indoor and outdoor air quality for Ontario and the air basin will improve the quality of life of residents, workers and visitors, decrease health care costs and make Ontario more prosperous by making the City a more desirable place to be.

GOAL ER4: Improved indoor and outdoor air quality and reduced locally generated pollutant emissions

ER4-1 *Land Use.* We reduce GHG and other local pollutant emissions through compact, mixed use, and transit-oriented development and development that improves the regional jobs-housing balance.

ER4-2 *Sensitive Land Uses.* We prohibit the future siting of sensitive land uses, within the distances defined by the California Air Resources Board for specific source categories, without sufficient mitigation.

ER4-3 *Greenhouse Gases (GHG) Emissions Reductions.* We will reduce GHG emissions in accordance with regional, state and federal regulations.

ER4-4 *Indoor Air Quality.* We will comply with State Green Building Codes relative to indoor air quality.

ER4-5 *Transportation.* We promote mass transit and non-motorized mobility options (e.g. walking, biking) to reduce air pollutant emissions.

ER4-6 Particulate Matter. We support efforts to reduce particulate matter to meet State and Federal Clean Air Standards.

ER4-7 *Other Agency Collaboration.* We collaborate with other agencies within the South Coast Air Basin to improve regional air quality at the emission source.

5.4 City of Ontario Community Climate Action Plan

The City of Ontario has adopted the Community Climate Action Plan (CCAP) to help reduce citywide GHG emissions and align the City with the statewide Scoping Plan GHG reduction efforts.

The CCAP has established Screening Tables, which are setup similar to a checklist, with points allocated to certain elements of the project that would contribute to reduced GHG emissions. If a project garners 100 points (by including enough GHG reducing elements), then the project is consistent with Ontario City's Community Climate Action Plan for reducing emissions and the impact may be considered less than significant for purposes of CEQA.

6.0 Air Quality Impact Analysis

Consistent with CEQA and the State CEQA Guidelines, a significant impact related to air quality would occur if the proposed project is determined to:

a) Conflict with or obstruct implementation of the applicable air quality plan.

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable Federal or State ambient air quality standard.

c) Expose sensitive receptors to substantial pollutant concentrations.

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

6.1 Short Term Air Quality Impacts - Construction

6.1.1 Daily Emissions - Construction

Daily air quality emissions include both on-site and off-site emissions associated with construction of the project. Regional daily emissions of criteria pollutants are compared to the SCAQMD thresholds of significance.

As shown in Table 13, daily emissions of criteria pollutants are expected to be below the allowable thresholds of significance.

CalEEMod daily emissions outputs are provided in Appendix A.

Table 13
Daily Construction Emissions

Maximum Daily Emissions (lbs/day)[1, 2]						
Activity	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Demolition	0.91	14.16	26.89	0.09	7.84	1.56
Site Preparation	0.55	2.08	21.68	0.04	7.78	3.98
Grading	0.85	3.36	33.90	0.06	3.85	1.56
Building Construction	4.86	17.12	60.88	0.16	11.46	3.28
Paving	1.29	1.25	17.86	0.02	0.21	0.08
Architectural Coating	70.26	0.56	8.39	0.02	1.96	0.53
Maximum[1]	**70.26**	**17.12**	**60.88**	**0.16**	**11.46**	**3.98**
SCAQMD Threshold	75	100	550	150	150	55
Exceeds Threshold (?)	**No**	**No**	**No**	**No**	**No**	**No**

[1] Maximum daily emission during summer or winter; includes both on-site and off-site project emissions.
[2] Includes fugitive dust control measures and Tier 4 engine requirements.

The project must follow mandatory SCAQMD rules and requirements with regards to fugitive dust control, as described in Section 6.1.3. Compliance with the standard dust control measures is considered to be part of the conditions of approval for the project and built into the design features.

Table 13 shows that, the project's daily construction emissions will be below the applicable SCAQMD air quality standards and thresholds of significance. As a result, the project would not contribute substantially to an existing or projected air quality violation.

Furthermore, by complying with the SCAQMD standards, the project would not contribute to a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

The project's short-term construction impact on regional air resources is less than significant.

6.1.2 Fugitive Dust - Construction

The Project is required to comply with regional rules that assist in reducing short-term air pollutant emissions associated with suspended particulate matter, also known as fugitive dust. Fugitive dust emissions are commonly associated with land clearing activities, cut-and-fill grading operations, and exposure of soils to the air and wind. SCAQMD Rule 403 requires that fugitive dust is controlled with best-available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. In addition, SCAQMD Rules 402 and 403 require implementation of dust suppression techniques to prevent fugitive dust from creating a nuisance off site.

The following recommendations are listed to ensure full compliance with the applicable dust control standards.

DF-1 Prepare and implement a Construction Management Plan which will include Best Available Control Measures to be submitted to the City of Ontario.

DF-2 Follow the standard SCAQMD rules and requirements with regards to fugitive dust control, which includes, but are not limited to the following:

1. All active construction areas shall be watered two (2) times daily.
2. Speed on unpaved roads shall be reduced to less than 15 mph.
3. Any visible dirt deposition on any public roadway shall be swept or washed at the site access points within 30 minutes.
4. Any on-site stockpiles of debris, dirt or other dusty material shall be covered or watered twice daily.
5. All operations on any unpaved surface shall be suspended if winds exceed 15 mph.
6. Access points shall be washed or swept daily.
7. Construction sites shall be sandbagged for erosion control.
8. Apply nontoxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for 10 days or more).
9. Cover all trucks hauling dirt, sand, soil, or other loose materials, and maintain at least 2 feet of freeboard space in accordance with the requirements of California Vehicle Code (CVC) section 23114.
10. Pave or gravel construction access roads at least 100 feet onto the site from the main road and use gravel aprons at truck exits.
11. Replace the ground cover of disturbed areas as quickly possible.

12. A fugitive dust control plan should be prepared and submitted to SCAQMD prior to the start of construction.

6.1.3 Odors - Construction

Heavy-duty equipment in the project area during construction will emit odors; however, the construction activity would cease to occur after individual construction is completed. The project is required to comply with Rule 402 during construction, which states that a person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. No other sources of objectionable odors have been identified for the proposed Project.

Therefore, the project impact from odor emissions is less than significant.

6.1.4 Asbestos - Construction

Asbestos is a carcinogen and is categorized as a hazardous air pollutant by the Environmental Protection Agency (EPA). Asbestos fibers imbedded within construction materials become a health hazard once they are disturbed and rendered airborne, such as through physical contact like building renovation and demolition activities. Asbestos is regulated through the National Emissions Standards for Hazardous Air Pollutants (NESHAP) and SCAQMD is the local enforcement authority for asbestos.

The project is not expected to require the demolition of existing building or structures. Therefore, the potential risk from exposure to asbestos during construction is small.

Asbestos also occurs naturally in serpentine and ultramafic rock. Based on the California Division of Mines and Geology General Location Guide for Ultramafic Rocks in California - Areas More Likely to Contain Naturally Occurring Asbestos, naturally occurring asbestos has not been shown to occur within in the vicinity of the project site. Therefore, the potential risk for naturally occurring asbestos (NOA) during project construction is small.

In the event asbestos is found on the site, the project will be required to comply with SCAQMD and NESHAP standards and protocols. SCAQMD Rule 1403 establishes the survey requirements, notification, and work practice requirements to prevent asbestos emissions

during construction activities. By following the required asbestos abatement protocols, the project impact from asbestos would be less than significant.

6.1.5 Diesel Particulate Matter - Construction

The greatest potential for toxic air contaminant emissions from the project would be related to diesel particulate matter (DPM) emissions associated with heavy diesel equipment used during construction. According to SCAQMD methodology, health effects from carcinogenic air toxics are usually described in terms of "individual cancer risk". "Individual Cancer Risk" is the likelihood that a person exposed to concentrations of toxic air contaminants over a 30-year lifetime will contract cancer, based on the use of standard risk-assessment methodology.

The proposed project's construction activity is not expected to be a long-term (i.e., 30 years) source of toxic air contaminant emissions, thus the individual cancer risk is greatly reduced.

However, given the close proximity of the project to nearest sensitive receptors (residential homes to the north), several measures are provided to help ensure the potential health risk associated with DPM during construction is reduced to the maximum extent feasible. This includes a requirement for Tier 4 engines on all diesel-powered construction equipment. Tier 4 engines, along with the latest national fuel standards, have been shown to yield PM reductions of over 95% from the typical Tier 2 and Tier 3 engines[8].

It is presumed that with the recommended design features and Tier 4 engines in place that the potential short term construction health risks will be adequately reduced to be less than significant. It should be noted however, that a quantified diesel health risk assessment (HRA) has not been prepared as part of the scope of this analysis.

The following design features are recommended to help ensure the project does not expose receptors to substantial pollution concentrations during construction:

DF-3 All diesel construction equipment shall have Tier 4 low emission "clean diesel" engines (OEM or retrofit) that include diesel oxidation catalysts and diesel particulate filters that meet the latest CARB best available control technology.

[8] EPA. Control of Emissions of Air Pollution from Nonroad Diesel Engines and Fuel; Final Rule. (40 CFR Parts 9, 69, et al.)

DF-4 Construction equipment shall be maintained in proper tune.

DF-5 All construction vehicles shall be prohibited from excessive idling. Excessive idling is defined as five (5) minutes or longer.

DF-6 Minimize the simultaneous operation of multiple construction equipment units.

DF-7 The use of heavy construction equipment and earthmoving activity shall be suspended during Air Alerts when the Air Quality Index reaches the "Unhealthy" level.

DF-8 Establish an electricity supply to the construction site and use electric powered equipment instead of diesel-powered equipment or generators, where feasible.

DF-9 Utilize zero VOC and low VOC paints and solvents, wherever possible.

6.2 Long Term Air Quality Impacts - Operation

6.2.1 Daily Emissions - Operation

Long-term operational air pollutant impacts from the project are shown in Table 14. The project is not expected to exceed any of the allowable daily emissions thresholds for criteria pollutants at the regional level. CalEEMod daily emissions outputs are provided in Appendix A.

The project's daily operational emissions will be below the applicable SCAQMD air quality thresholds of significance and the project would not contribute substantially to an existing or projected air quality violation. Furthermore, by complying with the SCAQMD standards, the project would not contribute to a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

The project related long-term air quality impacts are less than significant.

Table 14
Daily Operational Emissions

Maximum Daily Emissions (lbs/day)[1]						
Activity	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Mobile Sources	17.27	14.68	127.09	0.24	23.87	6.46
Energy Sources	0.30	2.55	1.10	0.02	0.21	0.21
Area Sources	19.70	10.40	61.39	0.07	1.10	1.10
Total	**37.26**	**27.64**	**189.58**	**0.32**	**25.18**	**7.77**
SCAQMD Threshold	55	55	550	150	150	55
Exceeds Threshold (?)	No	No	No	No	No	No

[1] Maximum daily emission during summer or winter; includes both on-site and off-site project emissions.
[2] Daily emissions reports are provided in Appendix A.

6.2.2 Odors - Operation

Land uses that commonly receive odor complaints include agricultural uses (farming and livestock), chemical plants, composting operations, dairies, fiberglass molding facilities, food processing plants, landfills, refineries, rail yards, and wastewater treatment plants. The proposed project does not contain land uses that would typically be associated with significant odor emissions.

The project will be required to comply with standard building code requirements related to exhaust ventilation, as well as comply with SCAQMD Rule 402. Rule 402 requires that a person may not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. Project related odors are not expected to meet the criteria of being a nuisance. **The project's operation would result in less than significant odor impacts.**

6.2.3 Toxic Air Contaminants - Operations

The project would consist of commercial/retail and residential land uses. These types of projects do not include major sources of toxic air contaminants (TAC) emissions that would result in significant exposure of sensitive receptors to substantial pollutant concentrations. Therefore, **the project impact is considered less than significant.**

7.0 Greenhouse Gas Impact Analysis

Consistent with CEQA Guidelines, a significant impact related to greenhouse gas would occur if the proposed project is determined to:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of greenhouse gases.

For purposes of this project, the City of Ontario CCAP establishes the requirements for determining whether a project would have a significant impact to GHG emissions under CEQA.

The CCAP uses Screening Tables, which are setup similar to a checklist, with points allocated to certain elements of the project to reduce GHG emissions. If a project garners 100 points (by including enough GHG reducing elements), then the project is consistent with CCAP and the impact may be considered less than significant for purposes of CEQA.

The proposed project is expected to comply with the CCAP by implementing the Screening Table requirements into the project design. To help ensure the project adheres to the CCAP requirements, the following project design feature is provided:

DF-10 Implement the GHG Reduction Measures from the Ontario County Climate Action Plan (CAP) Screening Tables to achieve at least 100 points, per the requirements for Mixed Use Projects.

As described in Appendix B of the CCAP, for mixed use projects, both the residential and non-residential screening tables shall be completed. Mixed use Projects that garner at least 100 points will be consistent with the reduction quantities in the City's CAP and are considered less than significant for GHG emissions.

Therefore, with the implementation of the CCAP Screening Tables, the project is not expected to generate GHG emissions, either directly or indirectly, that would cause a significant impact on the environment. Also, by complying with the CCAP, the project will not conflict with an applicable plan, policy or regulation for the purpose of reducing the emissions of greenhouse gases and the impact is considered less than significant.

Furthermore, since the purpose of the City's CCAP is to ensure compliance with the state's climate initiatives for reducing GHG emissions, by complying with the CCAP, the project will also be in compliant with the broader statewide goals for combating climate change; such as those required in the CARB Scoping Plan and AB 32.

The mixed use project is also located within close proximity to high quality transit, located in a low VMT zone, and offers high-density residential development near commercial uses. The project will include pedestrian friendly and walkable design that will encourage fewer auto-based trips. The following project design features will be provided to further help reduce GHG emissions:

DF-11 Comply with the mandatory requirements of California Building Standards Code Title 24 Part 6 (Energy Code) and Title 24 Part 11 (CAL Green).

DF-12 Implement water conservation strategies, including low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and limit the amount of turf/sod, per CAL Green and City of Ontario requirements.

DF-13 Implement zero waste strategies, recycling and composting programs for residential and non-residential uses.

DF-14 Encourage residents and landscape maintenance crews to use electric landscaping equipment, such as lawn mowers and leaf blowers, wherever feasible.

DF-15 No natural gas or wood burning fireplaces shall be installed in any residential dwelling.

DF-16 Implement trip reduction measures that reduce the number of auto-based trips and encourage the use of transit, bicycling, and walking. Such as;

1. Improve the walkability and design of the project by including pedestrian and bicycling connections within the project site and to adjacent off-site facilities (i.e. sidewalks, crosswalks, foot paths, protected bike lanes, multi-purpose trails, direct parcel-to-parcel connections, wayfinding signage, etc.).

2. Provide traffic calming measures (i.e. marked crosswalks, raised crosswalks, raised intersections, count-down signal timers, curb

extensions, speed tables, median islands, tight corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, etc.)

3. Provide bicycle racks for the retail and commercial uses and secure bicycle parking areas for the office and residential uses.

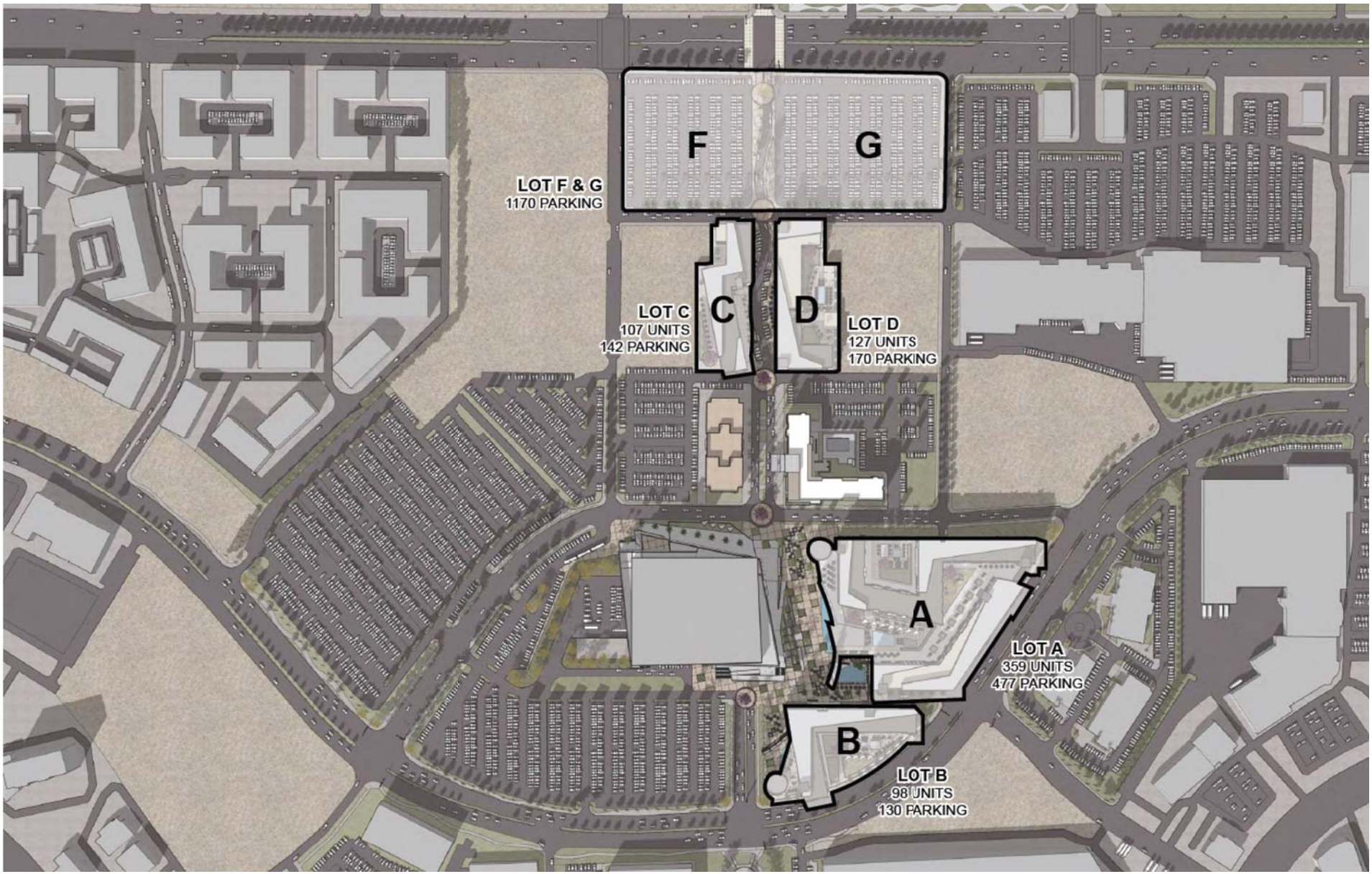
DF-17 Provide electric vehicle charging stations per the requirements of CALGreen.

Exhibits

Location Map

N

Exhibit B
Site Plan



Appendices

Appendix A

Daily Emissions Calculations Output
(CalEEMod)

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Toyota Arena Mixed Use Development

San Bernardino-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Mid Rise	691.00	Dwelling Unit	11.47	691,000.00	1976
Enclosed Parking with Elevator	919.00	Space	0.00	367,600.00	0
Parking Lot	1,170.00	Space	7.26	468,000.00	0
Regional Shopping Center	71.20	1000sqft	0.00	71,200.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	32
Climate Zone	10			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	531.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The proposed project consists of a mixed-use town center development with 691 multifamily DU and 71,200 square feet of commercial/retail land uses on approximately 18.73 acres.

Construction Phase - The project's architectural coating phase will be extended to 75 days.

Demolition - The project is proposing to demolish approximetely 326,026 square feet of surface asphalt parking lot.

Vehicle Trips - The trip generation rates have been updated to reflect Toyota Arena TIA Scoping Agreement, by RK, May 25, 2021 and Traffic Impact Study and SANBAG VMT Model.

Fleet Mix - Operational fleet mix adjusted to equal 2% trucks with GVWR > 10,000 lbs.

Woodstoves - SCAQMD Rule 445 restricts wood burning hearths/fireplaces from being installed in new development.

Construction Off-road Equipment Mitigation - Project will be required to comply with SCAQMD Rule 403 regarding fugitive dust control.

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	20.00	75.00
tblConstructionPhase	PhaseEndDate	4/13/2023	6/29/2023
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberWood	34.55	0.00
tblFleetMix	HHD	0.00	8.0940e-003
tblFleetMix	HHD	0.00	0.02
tblFleetMix	HHD	0.00	0.02
tblFleetMix	HHD	0.00	8.0940e-003
tblFleetMix	LDA	0.00	0.55
tblFleetMix	LDA	0.00	0.54
tblFleetMix	LDA	0.00	0.54
tblFleetMix	LDA	0.00	0.55
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT2	0.00	0.18
tblFleetMix	LDT2	0.00	0.17
tblFleetMix	LDT2	0.00	0.17
tblFleetMix	LDT2	0.00	0.18
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD2	0.00	3.3700e-003
tblFleetMix	LHD2	0.00	7.1960e-003

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblFleetMix	LHD2	0.00	7.1960e-003
tblFleetMix	LHD2	0.00	3.3700e-003
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MH	0.00	2.3750e-003
tblFleetMix	MH	0.00	5.0710e-003
tblFleetMix	MH	0.00	5.0710e-003
tblFleetMix	MH	0.00	2.3750e-003
tblFleetMix	MHD	0.00	5.3340e-003
tblFleetMix	MHD	0.00	0.01
tblFleetMix	MHD	0.00	0.01
tblFleetMix	MHD	0.00	5.3340e-003
tblFleetMix	OBUS	0.00	2.6200e-004
tblFleetMix	OBUS	0.00	5.5900e-004
tblFleetMix	OBUS	0.00	5.5900e-004
tblFleetMix	OBUS	0.00	2.6200e-004
tblFleetMix	SBUS	0.00	4.4700e-004
tblFleetMix	SBUS	0.00	9.5400e-004
tblFleetMix	SBUS	0.00	9.5400e-004
tblFleetMix	SBUS	0.00	4.4700e-004
tblFleetMix	UBUS	0.00	1.1900e-004
tblFleetMix	UBUS	0.00	2.5400e-004
tblFleetMix	UBUS	0.00	2.5400e-004

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblFleetMix	UBUS	0.00	1.1900e-004
tblLandUse	LotAcreage	18.18	11.47
tblLandUse	LotAcreage	8.27	0.00
tblLandUse	LotAcreage	10.53	7.26
tblLandUse	LotAcreage	1.63	0.00
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	HO_TL	8.70	4.37
tblVehicleTrips	HO_TTP	40.60	0.00
tblVehicleTrips	HS_TL	5.90	4.37
tblVehicleTrips	HS_TTP	19.20	0.00
tblVehicleTrips	HW_TL	14.70	4.37
tblVehicleTrips	HW_TTP	40.20	100.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	ST_TR	4.91	5.17
tblVehicleTrips	ST_TR	46.12	36.38
tblVehicleTrips	SU_TR	4.09	5.17
tblVehicleTrips	WD_TR	5.44	5.17
tblVehicleTrips	WD_TR	37.75	29.77
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	6.4347	46.4611	59.9899	0.1622	19.8582	2.0456	21.9038	10.1558	1.8819	12.0378	0.0000	16,507.4778	16,507.4778	1.9489	0.9233	16,807.9157
2022	5.7820	27.6734	55.8128	0.1582	11.1581	0.9758	12.1338	2.9915	0.9189	3.9104	0.0000	16,137.5984	16,137.5984	0.9697	0.8848	16,425.5012
2023	70.4209	24.2267	52.3577	0.1536	11.1580	0.8064	11.9644	2.9915	0.7587	3.7502	0.0000	15,714.5265	15,714.5265	0.9318	0.8384	15,987.6709
Maximum	**70.4209**	**46.4611**	**59.9899**	**0.1622**	**19.8582**	**2.0456**	**21.9038**	**10.1558**	**1.8819**	**12.0378**	**0.0000**	**16,507.4778**	**16,507.4778**	**1.9489**	**0.9233**	**16,807.9157**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	4.8616	16.4282	60.8749	0.1622	11.1581	0.2990	11.4571	3.9176	0.2858	3.9807	0.0000	16,507.4778	16,507.4778	1.9489	0.9233	16,807.9157
2022	4.4036	14.2925	56.9096	0.1582	11.1581	0.2076	11.3656	2.9915	0.1985	3.1900	0.0000	16,137.5984	16,137.5984	0.9697	0.8848	16,425.5012
2023	70.2589	12.0766	53.5740	0.1536	11.1580	0.1474	11.3054	2.9915	0.1410	3.1326	0.0000	15,714.5265	15,714.5265	0.9318	0.8384	15,987.6709
Maximum	**70.2589**	**16.4282**	**60.8749**	**0.1622**	**11.1581**	**0.2990**	**11.4571**	**3.9176**	**0.2858**	**3.9807**	**0.0000**	**16,507.4778**	**16,507.4778**	**1.9489**	**0.9233**	**16,807.9157**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	3.77	56.49	-1.90	0.00	20.63	82.92	25.81	38.65	82.43	47.69	0.00	0.00	0.00	0.00	0.00	0.00

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	19.6950	10.4024	61.3876	0.0652		1.1041	1.1041		1.1041	1.1041	0.0000	12,541.1224	12,541.1224	0.3383	0.2280	12,617.5340
Energy	0.2983	2.5513	1.1031	0.0163		0.2061	0.2061		0.2061	0.2061		3,253.7371	3,253.7371	0.0624	0.0597	3,273.0725
Mobile	17.2690	13.8038	127.0914	0.2363	23.6977	0.1690	23.8666	6.3029	0.1573	6.4602		24,255.5834	24,255.5834	1.5947	1.1054	24,624.8618
Total	**37.2623**	**26.7575**	**189.5821**	**0.3178**	**23.6977**	**1.4792**	**25.1768**	**6.3029**	**1.4675**	**7.7704**	**0.0000**	**40,050.4429**	**40,050.4429**	**1.9954**	**1.3931**	**40,515.4682**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	19.6950	10.4024	61.3876	0.0652		1.1041	1.1041		1.1041	1.1041	0.0000	12,541.1224	12,541.1224	0.3383	0.2280	12,617.5340
Energy	0.2983	2.5513	1.1031	0.0163		0.2061	0.2061		0.2061	0.2061		3,253.7371	3,253.7371	0.0624	0.0597	3,273.0725
Mobile	17.2690	13.8038	127.0914	0.2363	23.6977	0.1690	23.8666	6.3029	0.1573	6.4602		24,255.5834	24,255.5834	1.5947	1.1054	24,624.8618
Total	**37.2623**	**26.7575**	**189.5821**	**0.3178**	**23.6977**	**1.4792**	**25.1768**	**6.3029**	**1.4675**	**7.7704**	**0.0000**	**40,050.4429**	**40,050.4429**	**1.9954**	**1.3931**	**40,515.4682**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	10/1/2021	10/28/2021	5	20	
2	Site Preparation	Site Preparation	10/29/2021	11/11/2021	5	10	
3	Grading	Grading	11/12/2021	12/23/2021	5	30	
4	Building Construction	Building Construction	12/24/2021	2/16/2023	5	300	
5	Paving	Paving	2/17/2023	3/16/2023	5	20	
6	Architectural Coating	Architectural Coating	3/17/2023	6/29/2023	5	75	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 90

Acres of Paving: 7.26

Residential Indoor: 1,399,275; Residential Outdoor: 466,425; Non-Residential Indoor: 106,800; Non-Residential Outdoor: 35,600; Striped Parking Area: 50,136 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	7.00	231	0.29
Demolition	Excavators	3	8.00	158	0.38
Grading	Excavators	2	8.00	158	0.38

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	1,483.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	871.00	222.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	174.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					16.0493	0.0000	16.0493	2.4300	0.0000	2.4300			0.0000			0.0000
Off-Road	3.1651	31.4407	21.5650	0.0388		1.5513	1.5513		1.4411	1.4411		3,747.9449	3,747.9449	1.0549		3,774.3174
Total	**3.1651**	**31.4407**	**21.5650**	**0.0388**	**16.0493**	**1.5513**	**17.6006**	**2.4300**	**1.4411**	**3.8711**		**3,747.9449**	**3,747.9449**	**1.0549**		**3,774.3174**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Demolition - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3825	11.5481	2.9311	0.0448	1.2986	0.1738	1.4724	0.3561	0.1663	0.5224		4,874.0609	4,874.0609	0.2123	0.7723	5,109.5096
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0689	0.0459	0.6786	1.6000e-003	0.1677	9.4000e-004	0.1686	0.0445	8.6000e-004	0.0453		161.8483	161.8483	4.5800e-003	4.2800e-003	163.2380
Total	**0.4515**	**11.5940**	**3.6097**	**0.0464**	**1.4662**	**0.1748**	**1.6410**	**0.4006**	**0.1672**	**0.5677**		**5,035.9092**	**5,035.9092**	**0.2169**	**0.7766**	**5,272.7476**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.1388	0.0000	6.1388	0.9295	0.0000	0.9295			0.0000			0.0000
Off-Road	0.4623	2.0032	23.2798	0.0388		0.0616	0.0616		0.0616	0.0616	0.0000	3,747.9449	3,747.9449	1.0549		3,774.3174
Total	**0.4623**	**2.0032**	**23.2798**	**0.0388**	**6.1388**	**0.0616**	**6.2005**	**0.9295**	**0.0616**	**0.9911**	**0.0000**	**3,747.9449**	**3,747.9449**	**1.0549**		**3,774.3174**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Demolition - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3825	11.5481	2.9311	0.0448	1.2986	0.1738	1.4724	0.3561	0.1663	0.5224		4,874.0609	4,874.0609	0.2123	0.7723	5,109.5096
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0689	0.0459	0.6786	1.6000e-003	0.1677	9.4000e-004	0.1686	0.0445	8.6000e-004	0.0453		161.8483	161.8483	4.5800e-003	4.2800e-003	163.2380
Total	**0.4515**	**11.5940**	**3.6097**	**0.0464**	**1.4662**	**0.1748**	**1.6410**	**0.4006**	**0.1672**	**0.5677**		**5,035.9092**	**5,035.9092**	**0.2169**	**0.7766**	**5,272.7476**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809		3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**19.6570**	**2.0445**	**21.7015**	**10.1025**	**1.8809**	**11.9834**		**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0827	0.0551	0.8143	1.9200e-003	0.2012	1.1300e-003	0.2023	0.0534	1.0400e-003	0.0544		194.2180	194.2180	5.5000e-003	5.1300e-003	195.8856
Total	**0.0827**	**0.0551**	**0.8143**	**1.9200e-003**	**0.2012**	**1.1300e-003**	**0.2023**	**0.0534**	**1.0400e-003**	**0.0544**		**194.2180**	**194.2180**	**5.5000e-003**	**5.1300e-003**	**195.8856**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.5188	0.0000	7.5188	3.8642	0.0000	3.8642			0.0000			0.0000
Off-Road	0.4656	2.0175	20.8690	0.0380		0.0621	0.0621		0.0621	0.0621	0.0000	3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**0.4656**	**2.0175**	**20.8690**	**0.0380**	**7.5188**	**0.0621**	**7.5809**	**3.8642**	**0.0621**	**3.9263**	**0.0000**	**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0827	0.0551	0.8143	1.9200e-003	0.2012	1.1300e-003	0.2023	0.0534	1.0400e-003	0.0544		194.2180	194.2180	5.5000e-003	5.1300e-003	195.8856
Total	**0.0827**	**0.0551**	**0.8143**	**1.9200e-003**	**0.2012**	**1.1300e-003**	**0.2023**	**0.0534**	**1.0400e-003**	**0.0544**		**194.2180**	**194.2180**	**5.5000e-003**	**5.1300e-003**	**195.8856**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.2036	0.0000	9.2036	3.6538	0.0000	3.6538			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265		6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**9.2036**	**1.9853**	**11.1889**	**3.6538**	**1.8265**	**5.4803**		**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0919	0.0612	0.9048	2.1300e-003	0.2236	1.2500e-003	0.2248	0.0593	1.1500e-003	0.0604		215.7978	215.7978	6.1100e-003	5.7000e-003	217.6506
Total	**0.0919**	**0.0612**	**0.9048**	**2.1300e-003**	**0.2236**	**1.2500e-003**	**0.2248**	**0.0593**	**1.1500e-003**	**0.0604**		**215.7978**	**215.7978**	**6.1100e-003**	**5.7000e-003**	**217.6506**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.5204	0.0000	3.5204	1.3976	0.0000	1.3976			0.0000			0.0000
Off-Road	0.7616	3.3000	32.9991	0.0620		0.1015	0.1015		0.1015	0.1015	0.0000	6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**0.7616**	**3.3000**	**32.9991**	**0.0620**	**3.5204**	**0.1015**	**3.6219**	**1.3976**	**0.1015**	**1.4991**	**0.0000**	**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0919	0.0612	0.9048	2.1300e-003	0.2236	1.2500e-003	0.2248	0.0593	1.1500e-003	0.0604		215.7978	215.7978	6.1100e-003	5.7000e-003	217.6506
Total	**0.0919**	**0.0612**	**0.9048**	**2.1300e-003**	**0.2236**	**1.2500e-003**	**0.2248**	**0.0593**	**1.1500e-003**	**0.0604**		**215.7978**	**215.7978**	**6.1100e-003**	**5.7000e-003**	**217.6506**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.5310	11.5275	4.0099	0.0425	1.4223	0.2037	1.6261	0.4096	0.1949	0.6045		4,556.1208	4,556.1208	0.1292	0.6749	4,760.4663
Worker	4.0029	2.6661	39.4047	0.0928	9.7357	0.0545	9.7902	2.5820	0.0502	2.6321		9,397.9931	9,397.9931	0.2662	0.2485	9,478.6851
Total	**4.5338**	**14.1935**	**43.4147**	**0.1353**	**11.1581**	**0.2582**	**11.4163**	**2.9915**	**0.2451**	**3.2366**		**13,954.1139**	**13,954.1139**	**0.3954**	**0.9233**	**14,239.1514**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.5310	11.5275	4.0099	0.0425	1.4223	0.2037	1.6261	0.4096	0.1949	0.6045		4,556.1208	4,556.1208	0.1292	0.6749	4,760.4663
Worker	4.0029	2.6661	39.4047	0.0928	9.7357	0.0545	9.7902	2.5820	0.0502	2.6321		9,397.9931	9,397.9931	0.2662	0.2485	9,478.6851
Total	**4.5338**	**14.1935**	**43.4147**	**0.1353**	**11.1581**	**0.2582**	**11.4163**	**2.9915**	**0.2451**	**3.2366**		**13,954.1139**	**13,954.1139**	**0.3954**	**0.9233**	**14,239.1514**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.3869	9.7214	3.5677	0.0414	1.4223	0.1157	1.5380	0.4096	0.1107	0.5202		4,441.5281	4,441.5281	0.1200	0.6573	4,640.3962
Worker	3.6889	2.3364	35.8817	0.0899	9.7357	0.0511	9.7868	2.5820	0.0471	2.6290		9,141.7367	9,141.7367	0.2377	0.2275	9,215.4729
Total	**4.0757**	**12.0578**	**39.4494**	**0.1313**	**11.1581**	**0.1668**	**11.3248**	**2.9915**	**0.1577**	**3.1492**		**13,583.2648**	**13,583.2648**	**0.3577**	**0.8848**	**13,855.8690**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.3869	9.7214	3.5677	0.0414	1.4223	0.1157	1.5380	0.4096	0.1107	0.5202		4,441.5281	4,441.5281	0.1200	0.6573	4,640.3962
Worker	3.6889	2.3364	35.8817	0.0899	9.7357	0.0511	9.7868	2.5820	0.0471	2.6290		9,141.7367	9,141.7367	0.2377	0.2275	9,215.4729
Total	**4.0757**	**12.0578**	**39.4494**	**0.1313**	**11.1581**	**0.1668**	**11.3248**	**2.9915**	**0.1577**	**3.1492**		**13,583.2648**	**13,583.2648**	**0.3577**	**0.8848**	**13,855.8690**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2599	7.7868	3.2674	0.0397	1.4223	0.0585	1.4808	0.4096	0.0560	0.4655		4,260.5836	4,260.5836	0.1114	0.6292	4,450.8606
Worker	3.4058	2.0551	32.8463	0.0870	9.7357	0.0481	9.7838	2.5820	0.0443	2.6262		8,898.7330	8,898.7330	0.2126	0.2093	8,966.4042
Total	**3.6656**	**9.8419**	**36.1137**	**0.1267**	**11.1580**	**0.1066**	**11.2647**	**2.9915**	**0.1003**	**3.0918**		**13,159.3166**	**13,159.3166**	**0.3239**	**0.8384**	**13,417.2648**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2599	7.7868	3.2674	0.0397	1.4223	0.0585	1.4808	0.4096	0.0560	0.4655		4,260.5836	4,260.5836	0.1114	0.6292	4,450.8606
Worker	3.4058	2.0551	32.8463	0.0870	9.7357	0.0481	9.7838	2.5820	0.0443	2.6262		8,898.7330	8,898.7330	0.2126	0.2093	8,966.4042
Total	**3.6656**	**9.8419**	**36.1137**	**0.1267**	**11.1580**	**0.1066**	**11.2647**	**2.9915**	**0.1003**	**3.0918**		**13,159.3166**	**13,159.3166**	**0.3239**	**0.8384**	**13,417.2648**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694		2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.9511					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9838**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**		**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0587	0.0354	0.5657	1.5000e-003	0.1677	8.3000e-004	0.1685	0.0445	7.6000e-004	0.0452		153.2503	153.2503	3.6600e-003	3.6000e-003	154.4157
Total	**0.0587**	**0.0354**	**0.5657**	**1.5000e-003**	**0.1677**	**8.3000e-004**	**0.1685**	**0.0445**	**7.6000e-004**	**0.0452**		**153.2503**	**153.2503**	**3.6600e-003**	**3.6000e-003**	**154.4157**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2805	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374	0.0000	2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.9511					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2315**	**1.2154**	**17.2957**	**0.0228**		**0.0374**	**0.0374**		**0.0374**	**0.0374**	**0.0000**	**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0587	0.0354	0.5657	1.5000e-003	0.1677	8.3000e-004	0.1685	0.0445	7.6000e-004	0.0452		153.2503	153.2503	3.6600e-003	3.6000e-003	154.4157
Total	**0.0587**	**0.0354**	**0.5657**	**1.5000e-003**	**0.1677**	**8.3000e-004**	**0.1685**	**0.0445**	**7.6000e-004**	**0.0452**		**153.2503**	**153.2503**	**3.6600e-003**	**3.6000e-003**	**154.4157**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	69.5489					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708		281.4481	281.4481	0.0168		281.8690
Total	**69.7405**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**		**281.4481**	**281.4481**	**0.0168**		**281.8690**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.6804	0.4105	6.5617	0.0174	1.9449	9.6100e-003	1.9545	0.5158	8.8400e-003	0.5246		1,777.7033	1,777.7033	0.0425	0.0418	1,791.2220
Total	**0.6804**	**0.4105**	**6.5617**	**0.0174**	**1.9449**	**9.6100e-003**	**1.9545**	**0.5158**	**8.8400e-003**	**0.5246**		**1,777.7033**	**1,777.7033**	**0.0425**	**0.0418**	**1,791.2220**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	69.5489					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0297	0.1288	1.8324	2.9700e-003		3.9600e-003	3.9600e-003		3.9600e-003	3.9600e-003	0.0000	281.4481	281.4481	0.0168		281.8690
Total	**69.5786**	**0.1288**	**1.8324**	**2.9700e-003**		**3.9600e-003**	**3.9600e-003**		**3.9600e-003**	**3.9600e-003**	**0.0000**	**281.4481**	**281.4481**	**0.0168**		**281.8690**

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.6804	0.4105	6.5617	0.0174	1.9449	9.6100e-003	1.9545	0.5158	8.8400e-003	0.5246		1,777.7033	1,777.7033	0.0425	0.0418	1,791.2220
Total	**0.6804**	**0.4105**	**6.5617**	**0.0174**	**1.9449**	**9.6100e-003**	**1.9545**	**0.5158**	**8.8400e-003**	**0.5246**		**1,777.7033**	**1,777.7033**	**0.0425**	**0.0418**	**1,791.2220**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	17.2690	13.8038	127.0914	0.2363	23.6977	0.1690	23.8666	6.3029	0.1573	6.4602		24,255.5834	24,255.5834	1.5947	1.1054	24,624.8618
Unmitigated	17.2690	13.8038	127.0914	0.2363	23.6977	0.1690	23.8666	6.3029	0.1573	6.4602		24,255.5834	24,255.5834	1.5947	1.1054	24,624.8618

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	3,572.47	3,572.47	3572.47	5,682,657	5,682,657
Enclosed Parking with Elevator	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Regional Shopping Center	2,119.62	2,590.26	1502.32	4,539,098	4,539,098
Total	5,692.09	6,162.73	5,074.79	10,221,754	10,221,754

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	4.37	4.37	4.37	100.00	0.00	0.00	100	0	0
Enclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Regional Shopping Center	16.60	8.40	6.90	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.550545	0.057163	0.176442	0.142301	0.027646	0.003370	0.005334	0.008094	0.000262	0.000119	0.025903	0.000447	0.002375
Enclosed Parking with Elevator	0.537785	0.055838	0.172353	0.139003	0.027005	0.007196	0.011392	0.017285	0.000559	0.000254	0.025303	0.000954	0.005071
Parking Lot	0.537785	0.055838	0.172353	0.139003	0.027005	0.007196	0.011392	0.017285	0.000559	0.000254	0.025303	0.000954	0.005071
Regional Shopping Center	0.550545	0.057163	0.176442	0.142301	0.027646	0.003370	0.005334	0.008094	0.000262	0.000119	0.025903	0.000447	0.002375

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.2983	2.5513	1.1031	0.0163		0.2061	0.2061		0.2061	0.2061		3,253.7371	3,253.7371	0.0624	0.0597	3,273.0725
NaturalGas Unmitigated	0.2983	2.5513	1.1031	0.0163		0.2061	0.2061		0.2061	0.2061		3,253.7371	3,253.7371	0.0624	0.0597	3,273.0725

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	27227.6	0.2936	2.5092	1.0678	0.0160		0.2029	0.2029		0.2029	0.2029		3,203.2488	3,203.2488	0.0614	0.0587	3,222.2841
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	429.151	4.6300e-003	0.0421	0.0353	2.5000e-004		3.2000e-003	3.2000e-003		3.2000e-003	3.2000e-003		50.4883	50.4883	9.7000e-004	9.3000e-004	50.7883
Total		**0.2983**	**2.5513**	**1.1031**	**0.0163**		**0.2061**	**0.2061**		**0.2061**	**0.2061**		**3,253.7371**	**3,253.7371**	**0.0624**	**0.0597**	**3,273.0725**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	27.2276	0.2936	2.5092	1.0678	0.0160		0.2029	0.2029		0.2029	0.2029		3,203.2488	3,203.2488	0.0614	0.0587	3,222.2841
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	0.429151	4.6300e-003	0.0421	0.0353	2.5000e-004		3.2000e-003	3.2000e-003		3.2000e-003	3.2000e-003		50.4883	50.4883	9.7000e-004	9.3000e-004	50.7883
Total		**0.2983**	**2.5513**	**1.1031**	**0.0163**		**0.2061**	**0.2061**		**0.2061**	**0.2061**		**3,253.7371**	**3,253.7371**	**0.0624**	**0.0597**	**3,273.0725**

6.0 Area Detail

6.1 Mitigation Measures Area

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	19.6950	10.4024	61.3876	0.0652		1.1041	1.1041		1.1041	1.1041	0.0000	12,541.1224	12,541.1224	0.3383	0.2280	12,617.5340
Unmitigated	19.6950	10.4024	61.3876	0.0652		1.1041	1.1041		1.1041	1.1041	0.0000	12,541.1224	12,541.1224	0.3383	0.2280	12,617.5340

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.4291					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	15.3875					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1.1402	9.7431	4.1460	0.0622		0.7877	0.7877		0.7877	0.7877	0.0000	12,438.0000	12,438.0000	0.2384	0.2280	12,511.9128
Landscaping	1.7383	0.6593	57.2416	3.0300e-003		0.3164	0.3164		0.3164	0.3164		103.1224	103.1224	0.1000		105.6212
Total	**19.6950**	**10.4024**	**61.3876**	**0.0652**		**1.1041**	**1.1041**		**1.1041**	**1.1041**	**0.0000**	**12,541.1224**	**12,541.1224**	**0.3383**	**0.2280**	**12,617.5340**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.4291					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	15.3875					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1.1402	9.7431	4.1460	0.0622		0.7877	0.7877		0.7877	0.7877	0.0000	12,438.0000	12,438.0000	0.2384	0.2280	12,511.9128
Landscaping	1.7383	0.6593	57.2416	3.0300e-003		0.3164	0.3164		0.3164	0.3164		103.1224	103.1224	0.1000		105.6212
Total	**19.6950**	**10.4024**	**61.3876**	**0.0652**		**1.1041**	**1.1041**		**1.1041**	**1.1041**	**0.0000**	**12,541.1224**	**12,541.1224**	**0.3383**	**0.2280**	**12,617.5340**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Toyota Arena Mixed Use Development

San Bernardino-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Mid Rise	691.00	Dwelling Unit	11.47	691,000.00	1976
Enclosed Parking with Elevator	919.00	Space	0.00	367,600.00	0
Parking Lot	1,170.00	Space	7.26	468,000.00	0
Regional Shopping Center	71.20	1000sqft	0.00	71,200.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	32
Climate Zone	10			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	531.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The proposed project consists of a mixed-use town center development with 691 multifamily DU and 71,200 square feet of commercial/retail land uses on approximately 18.73 acres.

Construction Phase - The project's architectural coating phase will be extended to 75 days.

Demolition - The project is proposing to demolish approximetely 326,026 square feet of surface asphalt parking lot.

Vehicle Trips - The trip generation rates have been updated to reflect Toyota Arena TIA Scoping Agreement, by RK, May 25, 2021 and Traffic Impact Study and SANBAG VMT Model.

Fleet Mix - Operational fleet mix adjusted to equal 2% trucks with GVWR > 10,000 lbs.

Woodstoves - SCAQMD Rule 445 restricts wood burning hearths/fireplaces from being installed in new development.

Construction Off-road Equipment Mitigation - Project will be required to comply with SCAQMD Rule 403 regarding fugitive dust control.

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	20.00	75.00
tblConstructionPhase	PhaseEndDate	4/13/2023	6/29/2023
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberWood	34.55	0.00
tblFleetMix	HHD	0.00	8.0940e-003
tblFleetMix	HHD	0.00	0.02
tblFleetMix	HHD	0.00	0.02
tblFleetMix	HHD	0.00	8.0940e-003
tblFleetMix	LDA	0.00	0.55
tblFleetMix	LDA	0.00	0.54
tblFleetMix	LDA	0.00	0.54
tblFleetMix	LDA	0.00	0.55
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT2	0.00	0.18
tblFleetMix	LDT2	0.00	0.17
tblFleetMix	LDT2	0.00	0.17
tblFleetMix	LDT2	0.00	0.18
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD2	0.00	3.3700e-003
tblFleetMix	LHD2	0.00	7.1960e-003

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblFleetMix	LHD2	0.00	7.1960e-003
tblFleetMix	LHD2	0.00	3.3700e-003
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MH	0.00	2.3750e-003
tblFleetMix	MH	0.00	5.0710e-003
tblFleetMix	MH	0.00	5.0710e-003
tblFleetMix	MH	0.00	2.3750e-003
tblFleetMix	MHD	0.00	5.3340e-003
tblFleetMix	MHD	0.00	0.01
tblFleetMix	MHD	0.00	0.01
tblFleetMix	MHD	0.00	5.3340e-003
tblFleetMix	OBUS	0.00	2.6200e-004
tblFleetMix	OBUS	0.00	5.5900e-004
tblFleetMix	OBUS	0.00	5.5900e-004
tblFleetMix	OBUS	0.00	2.6200e-004
tblFleetMix	SBUS	0.00	4.4700e-004
tblFleetMix	SBUS	0.00	9.5400e-004
tblFleetMix	SBUS	0.00	9.5400e-004
tblFleetMix	SBUS	0.00	4.4700e-004
tblFleetMix	UBUS	0.00	1.1900e-004
tblFleetMix	UBUS	0.00	2.5400e-004
tblFleetMix	UBUS	0.00	2.5400e-004

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblFleetMix	UBUS	0.00	1.1900e-004
tblLandUse	LotAcreage	18.18	11.47
tblLandUse	LotAcreage	8.27	0.00
tblLandUse	LotAcreage	10.53	7.26
tblLandUse	LotAcreage	1.63	0.00
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	HO_TL	8.70	4.37
tblVehicleTrips	HO_TTP	40.60	0.00
tblVehicleTrips	HS_TL	5.90	4.37
tblVehicleTrips	HS_TTP	19.20	0.00
tblVehicleTrips	HW_TL	14.70	4.37
tblVehicleTrips	HW_TTP	40.20	100.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	ST_TR	4.91	5.17
tblVehicleTrips	ST_TR	46.12	36.38
tblVehicleTrips	SU_TR	4.09	5.17
tblVehicleTrips	WD_TR	5.44	5.17
tblVehicleTrips	WD_TR	37.75	29.77
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	6.2538	46.4642	53.0187	0.1535	19.8582	2.0456	21.9038	10.1558	1.8819	12.0378	0.0000	15,621.5062	15,621.5062	1.9489	0.9324	15,924.5846
2022	5.6217	28.2785	49.5312	0.1498	11.1581	0.9761	12.1342	2.9915	0.9192	3.9107	0.0000	15,280.3911	15,280.3911	0.9684	0.8933	15,570.8009
2023	70.3959	24.7705	46.6465	0.1455	11.1580	0.8066	11.9646	2.9915	0.7589	3.7504	0.0000	14,888.1518	14,888.1518	0.9311	0.8471	15,163.8676
Maximum	**70.3959**	**46.4642**	**53.0187**	**0.1535**	**19.8582**	**2.0456**	**21.9038**	**10.1558**	**1.8819**	**12.0378**	**0.0000**	**15,621.5062**	**15,621.5062**	**1.9489**	**0.9324**	**15,924.5846**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	4.6807	17.1150	53.9038	0.1535	11.1581	0.2995	11.4576	3.9176	0.2863	3.9807	0.0000	15,621.5062	15,621.5062	1.9489	0.9324	15,924.5846
2022	4.2433	14.8976	50.6281	0.1498	11.1581	0.2079	11.3660	2.9915	0.1988	3.1904	0.0000	15,280.3911	15,280.3911	0.9684	0.8933	15,570.8009
2023	70.2340	12.6203	47.8627	0.1455	11.1580	0.1477	11.3057	2.9915	0.1413	3.1328	0.0000	14,888.1518	14,888.1518	0.9311	0.8471	15,163.8676
Maximum	**70.2340**	**17.1150**	**53.9038**	**0.1535**	**11.1581**	**0.2995**	**11.4576**	**3.9176**	**0.2863**	**3.9807**	**0.0000**	**15,621.5062**	**15,621.5062**	**1.9489**	**0.9324**	**15,924.5846**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	3.78	55.15	-2.14	0.00	20.63	82.89	25.81	38.65	82.40	47.69	0.00	0.00	0.00	0.00	0.00	0.00

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	19.6950	10.4024	61.3876	0.0652		1.1041	1.1041		1.1041	1.1041	0.0000	12,541.1224	12,541.1224	0.3383	0.2280	12,617.5340
Energy	0.2983	2.5513	1.1031	0.0163		0.2061	0.2061		0.2061	0.2061		3,253.7371	3,253.7371	0.0624	0.0597	3,273.0725
Mobile	14.6266	14.6824	116.7457	0.2181	23.6977	0.1691	23.8667	6.3029	0.1574	6.4603		22,396.7406	22,396.7406	1.6802	1.1415	22,778.9089
Total	**34.6199**	**27.6361**	**179.2364**	**0.2996**	**23.6977**	**1.4793**	**25.1769**	**6.3029**	**1.4676**	**7.7705**	**0.0000**	**38,191.6001**	**38,191.6001**	**2.0809**	**1.4292**	**38,669.5153**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	19.6950	10.4024	61.3876	0.0652		1.1041	1.1041		1.1041	1.1041	0.0000	12,541.1224	12,541.1224	0.3383	0.2280	12,617.5340
Energy	0.2983	2.5513	1.1031	0.0163		0.2061	0.2061		0.2061	0.2061		3,253.7371	3,253.7371	0.0624	0.0597	3,273.0725
Mobile	14.6266	14.6824	116.7457	0.2181	23.6977	0.1691	23.8667	6.3029	0.1574	6.4603		22,396.7406	22,396.7406	1.6802	1.1415	22,778.9089
Total	**34.6199**	**27.6361**	**179.2364**	**0.2996**	**23.6977**	**1.4793**	**25.1769**	**6.3029**	**1.4676**	**7.7705**	**0.0000**	**38,191.6001**	**38,191.6001**	**2.0809**	**1.4292**	**38,669.5153**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	10/1/2021	10/28/2021	5	20	
2	Site Preparation	Site Preparation	10/29/2021	11/11/2021	5	10	
3	Grading	Grading	11/12/2021	12/23/2021	5	30	
4	Building Construction	Building Construction	12/24/2021	2/16/2023	5	300	
5	Paving	Paving	2/17/2023	3/16/2023	5	20	
6	Architectural Coating	Architectural Coating	3/17/2023	6/29/2023	5	75	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 90

Acres of Paving: 7.26

Residential Indoor: 1,399,275; Residential Outdoor: 466,425; Non-Residential Indoor: 106,800; Non-Residential Outdoor: 35,600; Striped Parking Area: 50,136 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	7.00	231	0.29
Demolition	Excavators	3	8.00	158	0.38
Grading	Excavators	2	8.00	158	0.38

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	1,483.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	871.00	222.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	174.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					16.0493	0.0000	16.0493	2.4300	0.0000	2.4300			0.0000			0.0000
Off-Road	3.1651	31.4407	21.5650	0.0388		1.5513	1.5513		1.4411	1.4411		3,747.9449	3,747.9449	1.0549		3,774.3174
Total	**3.1651**	**31.4407**	**21.5650**	**0.0388**	**16.0493**	**1.5513**	**17.6006**	**2.4300**	**1.4411**	**3.8711**		**3,747.9449**	**3,747.9449**	**1.0549**		**3,774.3174**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Demolition - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3721	12.1085	2.9946	0.0448	1.2986	0.1740	1.4726	0.3561	0.1665	0.5226		4,876.6311	4,876.6311	0.2118	0.7727	5,112.1890
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0661	0.0483	0.5563	1.4500e-003	0.1677	9.4000e-004	0.1686	0.0445	8.6000e-004	0.0453		146.5366	146.5366	4.5600e-003	4.4200e-003	147.9673
Total	**0.4382**	**12.1568**	**3.5508**	**0.0463**	**1.4662**	**0.1750**	**1.6412**	**0.4006**	**0.1674**	**0.5679**		**5,023.1677**	**5,023.1677**	**0.2163**	**0.7771**	**5,260.1563**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.1388	0.0000	6.1388	0.9295	0.0000	0.9295			0.0000			0.0000
Off-Road	0.4623	2.0032	23.2798	0.0388		0.0616	0.0616		0.0616	0.0616	0.0000	3,747.9449	3,747.9449	1.0549		3,774.3174
Total	**0.4623**	**2.0032**	**23.2798**	**0.0388**	**6.1388**	**0.0616**	**6.2005**	**0.9295**	**0.0616**	**0.9911**	**0.0000**	**3,747.9449**	**3,747.9449**	**1.0549**		**3,774.3174**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Demolition - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3721	12.1085	2.9946	0.0448	1.2986	0.1740	1.4726	0.3561	0.1665	0.5226		4,876.6311	4,876.6311	0.2118	0.7727	5,112.1890
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0661	0.0483	0.5563	1.4500e-003	0.1677	9.4000e-004	0.1686	0.0445	8.6000e-004	0.0453		146.5366	146.5366	4.5600e-003	4.4200e-003	147.9673
Total	**0.4382**	**12.1568**	**3.5508**	**0.0463**	**1.4662**	**0.1750**	**1.6412**	**0.4006**	**0.1674**	**0.5679**		**5,023.1677**	**5,023.1677**	**0.2163**	**0.7771**	**5,260.1563**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809		3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**19.6570**	**2.0445**	**21.7015**	**10.1025**	**1.8809**	**11.9834**		**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0793	0.0580	0.6675	1.7400e-003	0.2012	1.1300e-003	0.2023	0.0534	1.0400e-003	0.0544		175.8439	175.8439	5.4700e-003	5.3000e-003	177.5607
Total	**0.0793**	**0.0580**	**0.6675**	**1.7400e-003**	**0.2012**	**1.1300e-003**	**0.2023**	**0.0534**	**1.0400e-003**	**0.0544**		**175.8439**	**175.8439**	**5.4700e-003**	**5.3000e-003**	**177.5607**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.5188	0.0000	7.5188	3.8642	0.0000	3.8642			0.0000			0.0000
Off-Road	0.4656	2.0175	20.8690	0.0380		0.0621	0.0621		0.0621	0.0621	0.0000	3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**0.4656**	**2.0175**	**20.8690**	**0.0380**	**7.5188**	**0.0621**	**7.5809**	**3.8642**	**0.0621**	**3.9263**	**0.0000**	**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0793	0.0580	0.6675	1.7400e-003	0.2012	1.1300e-003	0.2023	0.0534	1.0400e-003	0.0544		175.8439	175.8439	5.4700e-003	5.3000e-003	177.5607
Total	**0.0793**	**0.0580**	**0.6675**	**1.7400e-003**	**0.2012**	**1.1300e-003**	**0.2023**	**0.0534**	**1.0400e-003**	**0.0544**		**175.8439**	**175.8439**	**5.4700e-003**	**5.3000e-003**	**177.5607**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.2036	0.0000	9.2036	3.6538	0.0000	3.6538			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265		6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**9.2036**	**1.9853**	**11.1889**	**3.6538**	**1.8265**	**5.4803**		**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0881	0.0644	0.7417	1.9300e-003	0.2236	1.2500e-003	0.2248	0.0593	1.1500e-003	0.0604		195.3821	195.3821	6.0800e-003	5.8900e-003	197.2897
Total	**0.0881**	**0.0644**	**0.7417**	**1.9300e-003**	**0.2236**	**1.2500e-003**	**0.2248**	**0.0593**	**1.1500e-003**	**0.0604**		**195.3821**	**195.3821**	**6.0800e-003**	**5.8900e-003**	**197.2897**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.5204	0.0000	3.5204	1.3976	0.0000	1.3976			0.0000			0.0000
Off-Road	0.7616	3.3000	32.9991	0.0620		0.1015	0.1015		0.1015	0.1015	0.0000	6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**0.7616**	**3.3000**	**32.9991**	**0.0620**	**3.5204**	**0.1015**	**3.6219**	**1.3976**	**0.1015**	**1.4991**	**0.0000**	**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

3.4 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0881	0.0644	0.7417	1.9300e-003	0.2236	1.2500e-003	0.2248	0.0593	1.1500e-003	0.0604		195.3821	195.3821	6.0800e-003	5.8900e-003	197.2897
Total	**0.0881**	**0.0644**	**0.7417**	**1.9300e-003**	**0.2236**	**1.2500e-003**	**0.2248**	**0.0593**	**1.1500e-003**	**0.0604**		**195.3821**	**195.3821**	**6.0800e-003**	**5.8900e-003**	**197.2897**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.5177	12.0752	4.1438	0.0425	1.4223	0.2042	1.6266	0.4096	0.1954	0.6050		4,559.2529	4,559.2529	0.1286	0.6758	4,763.8543
Worker	3.8352	2.8050	32.2997	0.0840	9.7357	0.0545	9.7902	2.5820	0.0502	2.6321		8,508.8894	8,508.8894	0.2646	0.2566	8,591.9661
Total	**4.3529**	**14.8803**	**36.4435**	**0.1265**	**11.1581**	**0.2587**	**11.4168**	**2.9915**	**0.2456**	**3.2371**		**13,068.1423**	**13,068.1423**	**0.3932**	**0.9324**	**13,355.8204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.5177	12.0752	4.1438	0.0425	1.4223	0.2042	1.6266	0.4096	0.1954	0.6050		4,559.2529	4,559.2529	0.1286	0.6758	4,763.8543
Worker	3.8352	2.8050	32.2997	0.0840	9.7357	0.0545	9.7902	2.5820	0.0502	2.6321		8,508.8894	8,508.8894	0.2646	0.2566	8,591.9661
Total	**4.3529**	**14.8803**	**36.4435**	**0.1265**	**11.1581**	**0.2587**	**11.4168**	**2.9915**	**0.2456**	**3.2371**		**13,068.1423**	**13,068.1423**	**0.3932**	**0.9324**	**13,355.8204**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.3718	10.2054	3.6933	0.0415	1.4223	0.1160	1.5383	0.4096	0.1110	0.5206		4,446.4272	4,446.4272	0.1193	0.6584	4,645.6165
Worker	3.5437	2.4575	29.4745	0.0814	9.7357	0.0511	9.7868	2.5820	0.0471	2.6290		8,279.6303	8,279.6303	0.2371	0.2349	8,355.5522
Total	**3.9155**	**12.6629**	**33.1678**	**0.1229**	**11.1581**	**0.1671**	**11.3252**	**2.9915**	**0.1580**	**3.1496**		**12,726.0575**	**12,726.0575**	**0.3564**	**0.8933**	**13,001.1687**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.3718	10.2054	3.6933	0.0415	1.4223	0.1160	1.5383	0.4096	0.1110	0.5206		4,446.4272	4,446.4272	0.1193	0.6584	4,645.6165
Worker	3.5437	2.4575	29.4745	0.0814	9.7357	0.0511	9.7868	2.5820	0.0471	2.6290		8,279.6303	8,279.6303	0.2371	0.2349	8,355.5522
Total	**3.9155**	**12.6629**	**33.1678**	**0.1229**	**11.1581**	**0.1671**	**11.3252**	**2.9915**	**0.1580**	**3.1496**		**12,726.0575**	**12,726.0575**	**0.3564**	**0.8933**	**13,001.1687**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2418	8.2248	3.3683	0.0398	1.4223	0.0588	1.4811	0.4096	0.0562	0.4658		4,270.9160	4,270.9160	0.1105	0.6311	4,461.7532
Worker	3.2807	2.1608	27.0342	0.0788	9.7357	0.0481	9.7838	2.5820	0.0443	2.6262		8,062.0259	8,062.0259	0.2128	0.2160	8,131.7084
Total	**3.5225**	**10.3856**	**30.4025**	**0.1186**	**11.1580**	**0.1069**	**11.2649**	**2.9915**	**0.1005**	**3.0920**		**12,332.9419**	**12,332.9419**	**0.3233**	**0.8471**	**12,593.4615**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2418	8.2248	3.3683	0.0398	1.4223	0.0588	1.4811	0.4096	0.0562	0.4658		4,270.9160	4,270.9160	0.1105	0.6311	4,461.7532
Worker	3.2807	2.1608	27.0342	0.0788	9.7357	0.0481	9.7838	2.5820	0.0443	2.6262		8,062.0259	8,062.0259	0.2128	0.2160	8,131.7084
Total	**3.5225**	**10.3856**	**30.4025**	**0.1186**	**11.1580**	**0.1069**	**11.2649**	**2.9915**	**0.1005**	**3.0920**		**12,332.9419**	**12,332.9419**	**0.3233**	**0.8471**	**12,593.4615**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694		2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.9511					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9838**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**		**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0565	0.0372	0.4656	1.3600e-003	0.1677	8.3000e-004	0.1685	0.0445	7.6000e-004	0.0452		138.8409	138.8409	3.6600e-003	3.7200e-003	140.0409
Total	**0.0565**	**0.0372**	**0.4656**	**1.3600e-003**	**0.1677**	**8.3000e-004**	**0.1685**	**0.0445**	**7.6000e-004**	**0.0452**		**138.8409**	**138.8409**	**3.6600e-003**	**3.7200e-003**	**140.0409**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2805	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374	0.0000	2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.9511					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2315**	**1.2154**	**17.2957**	**0.0228**		**0.0374**	**0.0374**		**0.0374**	**0.0374**	**0.0000**	**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0565	0.0372	0.4656	1.3600e-003	0.1677	8.3000e-004	0.1685	0.0445	7.6000e-004	0.0452		138.8409	138.8409	3.6600e-003	3.7200e-003	140.0409
Total	**0.0565**	**0.0372**	**0.4656**	**1.3600e-003**	**0.1677**	**8.3000e-004**	**0.1685**	**0.0445**	**7.6000e-004**	**0.0452**		**138.8409**	**138.8409**	**3.6600e-003**	**3.7200e-003**	**140.0409**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	69.5489					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708		281.4481	281.4481	0.0168		281.8690
Total	**69.7405**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**		**281.4481**	**281.4481**	**0.0168**		**281.8690**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.6554	0.4317	5.4006	0.0157	1.9449	9.6100e-003	1.9545	0.5158	8.8400e-003	0.5246		1,610.5540	1,610.5540	0.0425	0.0432	1,624.4745
Total	**0.6554**	**0.4317**	**5.4006**	**0.0157**	**1.9449**	**9.6100e-003**	**1.9545**	**0.5158**	**8.8400e-003**	**0.5246**		**1,610.5540**	**1,610.5540**	**0.0425**	**0.0432**	**1,624.4745**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	69.5489					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0297	0.1288	1.8324	2.9700e-003		3.9600e-003	3.9600e-003		3.9600e-003	3.9600e-003	0.0000	281.4481	281.4481	0.0168		281.8690
Total	**69.5786**	**0.1288**	**1.8324**	**2.9700e-003**		**3.9600e-003**	**3.9600e-003**		**3.9600e-003**	**3.9600e-003**	**0.0000**	**281.4481**	**281.4481**	**0.0168**		**281.8690**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.6554	0.4317	5.4006	0.0157	1.9449	9.6100e-003	1.9545	0.5158	8.8400e-003	0.5246		1,610.5540	1,610.5540	0.0425	0.0432	1,624.4745
Total	**0.6554**	**0.4317**	**5.4006**	**0.0157**	**1.9449**	**9.6100e-003**	**1.9545**	**0.5158**	**8.8400e-003**	**0.5246**		**1,610.5540**	**1,610.5540**	**0.0425**	**0.0432**	**1,624.4745**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	14.6266	14.6824	116.7457	0.2181	23.6977	0.1691	23.8667	6.3029	0.1574	6.4603		22,396.7406	22,396.7406	1.6802	1.1415	22,778.9089
Unmitigated	14.6266	14.6824	116.7457	0.2181	23.6977	0.1691	23.8667	6.3029	0.1574	6.4603		22,396.7406	22,396.7406	1.6802	1.1415	22,778.9089

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	3,572.47	3,572.47	3572.47	5,682,657	5,682,657
Enclosed Parking with Elevator	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Regional Shopping Center	2,119.62	2,590.26	1502.32	4,539,098	4,539,098
Total	5,692.09	6,162.73	5,074.79	10,221,754	10,221,754

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	4.37	4.37	4.37	100.00	0.00	0.00	100	0	0
Enclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Regional Shopping Center	16.60	8.40	6.90	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.550545	0.057163	0.176442	0.142301	0.027646	0.003370	0.005334	0.008094	0.000262	0.000119	0.025903	0.000447	0.002375
Enclosed Parking with Elevator	0.537785	0.055838	0.172353	0.139003	0.027005	0.007196	0.011392	0.017285	0.000559	0.000254	0.025303	0.000954	0.005071
Parking Lot	0.537785	0.055838	0.172353	0.139003	0.027005	0.007196	0.011392	0.017285	0.000559	0.000254	0.025303	0.000954	0.005071
Regional Shopping Center	0.550545	0.057163	0.176442	0.142301	0.027646	0.003370	0.005334	0.008094	0.000262	0.000119	0.025903	0.000447	0.002375

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.2983	2.5513	1.1031	0.0163		0.2061	0.2061		0.2061	0.2061		3,253.7371	3,253.7371	0.0624	0.0597	3,273.0725
NaturalGas Unmitigated	0.2983	2.5513	1.1031	0.0163		0.2061	0.2061		0.2061	0.2061		3,253.7371	3,253.7371	0.0624	0.0597	3,273.0725

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	27227.6	0.2936	2.5092	1.0678	0.0160		0.2029	0.2029		0.2029	0.2029		3,203.2488	3,203.2488	0.0614	0.0587	3,222.2841
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	429.151	4.6300e-003	0.0421	0.0353	2.5000e-004		3.2000e-003	3.2000e-003		3.2000e-003	3.2000e-003		50.4883	50.4883	9.7000e-004	9.3000e-004	50.7883
Total		**0.2983**	**2.5513**	**1.1031**	**0.0163**		**0.2061**	**0.2061**		**0.2061**	**0.2061**		**3,253.7371**	**3,253.7371**	**0.0624**	**0.0597**	**3,273.0725**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	27.2276	0.2936	2.5092	1.0678	0.0160		0.2029	0.2029		0.2029	0.2029		3,203.2488	3,203.2488	0.0614	0.0587	3,222.2841
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	0.429151	4.6300e-003	0.0421	0.0353	2.5000e-004		3.2000e-003	3.2000e-003		3.2000e-003	3.2000e-003		50.4883	50.4883	9.7000e-004	9.3000e-004	50.7883
Total		**0.2983**	**2.5513**	**1.1031**	**0.0163**		**0.2061**	**0.2061**		**0.2061**	**0.2061**		**3,253.7371**	**3,253.7371**	**0.0624**	**0.0597**	**3,273.0725**

6.0 Area Detail

6.1 Mitigation Measures Area

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	19.6950	10.4024	61.3876	0.0652		1.1041	1.1041		1.1041	1.1041	0.0000	12,541.1224	12,541.1224	0.3383	0.2280	12,617.5340
Unmitigated	19.6950	10.4024	61.3876	0.0652		1.1041	1.1041		1.1041	1.1041	0.0000	12,541.1224	12,541.1224	0.3383	0.2280	12,617.5340

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.4291					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	15.3875					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1.1402	9.7431	4.1460	0.0622		0.7877	0.7877		0.7877	0.7877	0.0000	12,438.0000	12,438.0000	0.2384	0.2280	12,511.9128
Landscaping	1.7383	0.6593	57.2416	3.0300e-003		0.3164	0.3164		0.3164	0.3164		103.1224	103.1224	0.1000		105.6212
Total	**19.6950**	**10.4024**	**61.3876**	**0.0652**		**1.1041**	**1.1041**		**1.1041**	**1.1041**	**0.0000**	**12,541.1224**	**12,541.1224**	**0.3383**	**0.2280**	**12,617.5340**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.4291					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	15.3875					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1.1402	9.7431	4.1460	0.0622		0.7877	0.7877		0.7877	0.7877	0.0000	12,438.0000	12,438.0000	0.2384	0.2280	12,511.9128
Landscaping	1.7383	0.6593	57.2416	3.0300e-003		0.3164	0.3164		0.3164	0.3164		103.1224	103.1224	0.1000		105.6212
Total	**19.6950**	**10.4024**	**61.3876**	**0.0652**		**1.1041**	**1.1041**		**1.1041**	**1.1041**	**0.0000**	**12,541.1224**	**12,541.1224**	**0.3383**	**0.2280**	**12,617.5340**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix B

City of Ontario
Community Climate Action Plan Screening Table

Instructions for Residential, Commercial, or Industrial Projects

The Screening Table assigns points for each option incorporated into a project as mitigation or a project design feature (collectively referred to as "feature"). The point values correspond to the minimum emissions reduction expected from each feature. The menu of features allows maximum flexibility and options for how development projects can implement the GHG reduction measures. The point levels are based upon improvements compared to 2008 emission levels of efficiency. Projects that garner at least 100 points will be consistent with the reduction quantities anticipated in the City's CAP. As such, those projects that garner a total of 100 points or greater would not require quantification of project specific GHG emissions. Consistent with CEQA Guidelines, such projects would be determined to have a less than significant individual and cumulative impact for GHG emissions.

Instructions for Mixed Use Projects

Mixed use projects provide additional opportunities to reduce emissions by combining complimentary land uses in a manner that can reduce vehicle trips. Mixed use projects also have the potential to complement energy efficient infrastructure in a way that reduces emissions. For mixed use projects, fill out both Screening Table 1 and Table 2, but proportion the points identical to the proportioning of the mix of uses. As an example, a mixed use project that is 50% commercial uses and 50% residential uses will show ½ point for each assigned point value in Table 1 and Table 2. Add the points from both tables. Mixed use Projects that garner at least 100 points will be consistent with the reduction quantities in the City's CAP and are considered less than significant for GHG emissions.

Those projects that do not garnish 100 points using the screening tables will need to provide additional analysis to determine the significance of GHG emissions. Nothing in this guidance shall be construed as limiting the City's authority to adopt a statement of overriding consideration for projects with significant GHG impacts. The following tables provides a menu of performance standards/options related to GHG mitigation measures and design features that can be used to demonstrate consistency with the reduction measures and GHG reduction quantities in the CAP.

Table 1: Screening Table for Implementation of GHG Reduction Measures for Residential Development

Feature	Description	Assigned Point Values	Project Points
Reduction Measure PS E1: Residential Energy Efficiency			
Building Envelope			
Insulation	2008 Baseline (walls R-13:, roof/attic: R-30)	0 points	12
	Modestly Enhanced Insulation (walls R-13:, roof/attic: R-38)	12 points	
	Enhanced Insulation (rigid wall insulation R-13, roof/attic: R-38)	15 points	
	Greatly Enhanced Insulation (spray foam wall insulated walls R-15 or higher, roof/attic R-38 or higher)	18 points	
Windows	2008 Baseline Windows (0.57 U-factor, 0.4 solar heat gain coefficient (SHGC)	0 points	06
	Modestly Enhanced Window Insulation (0.4 U-Factor, 0.32 SHGC)	6 points	
	Enhanced Window Insulation (0.32 U-Factor, 0.25 SHGC)	7 points	
	Greatly Enhanced Window Insulation (0.28 or less U-Factor, 0.22 or less SHGC)	9 points	
Cool Roof	Modest Cool Roof (CRRC Rated 0.15 aged solar reflectance, 0.75 thermal emittance)	10 points	10
	Enhanced Cool Roof(CRRC Rated 0.2 aged solar reflectance, 0.75 thermal emittance)	12 points	
	Greatly Enhanced Cool Roof (CRRC Rated 0.35 aged solar reflectance, 0.75 thermal emittance)	14 points	
Air Infiltration	Minimizing leaks in the building envelope is as important as the insulation properties of the building. Insulation does not work effectively if there is excess air leakage.		10
	Air barrier applied to exterior walls, calking, and visual inspection such as the HERS Verified Quality Insulation Installation (QII or equivalent)	10 points	
	Blower Door HERS Verified Envelope Leakage or equivalent	8 points	
Thermal Storage of Building	Thermal storage is a design characteristic that helps keep a constant temperature in the building. Common thermal storage devices include strategically placed water filled columns, water storage tanks, and thick masonry walls.		
	Modest Thermal Mass (10% of floor or 10% of walls: 12" or more thick exposed concrete or masonry. No permanently installed floor covering such as carpet, linoleum, wood or other insulating materials)	2 points	
	Enhanced Thermal Mass (20% of floor or 20% of walls: 12" or more thick exposed concrete or masonry. No permanently installed floor covering such as carpet, linoleum, wood or other insulating materials)	4 points	

Feature	Description	Assigned Point Values	Project Points
Indoor Space Efficiencies			
Heating/ Cooling Distribution System	Minimum Duct Insulation (R-4.2 required)	0 points	07
	Modest Duct insulation (R-6)	7 points	
	Enhanced Duct Insulation (R-8)	8 points	
	Distribution loss reduction with inspection (HERS Verified Duct Leakage or equivalent)	12 points	
Space Heating/ Cooling Equipment	2008 Minimum HVAC Efficiency (SEER 13/60% AFUE or 7.7 HSPF)	0 points	04
	Improved Efficiency HVAC (SEER 14/65% AFUE or 8 HSPF)	4 points	
	High Efficiency HVAC (SEER 15/72% AFUE or 8.5 HSPF)	7 points	
	Very High Efficiency HVAC (SEER 16/80% AFUE or 9 HSPF)	9 points	
Water Heaters	2008 Minimum Efficiency (0.57 Energy Factor)	0 points	12
	Improved Efficiency Water Heater (0.675 Energy Factor)	12 points	
	High Efficiency Water Heater (0.72 Energy Factor)	15 points	
	Very High Efficiency Water Heater (0.92 Energy Factor)	18 points	
	Solar Pre-heat System (0.2 Net Solar Fraction)	4 points	
	Enhanced Solar Pre-heat System (0.35 Net Solar Fraction)	8 points	
Daylighting	Daylighting is the ability of each room within the building to provide outside light during the day reducing the need for artificial lighting during daylight hours.		01
	All peripheral rooms within the living space have at least one window (required)	0 points	
	All rooms within the living space have daylight (through use of windows, solar tubes, skylights, etc.)	1 points	
	All rooms daylighted	2 points	
Artificial Lighting	2008 Minimum (required)	0 points	08
	Efficient Lights (25% of in-unit fixtures considered high efficacy. High efficacy is defined as 40 lumens/watt for 15 watt or less fixtures; 50 lumens/watt for 15-40 watt fixtures, 60 lumens/watt for fixtures >40watt)	8 points	
	High Efficiency Lights (50% of in-unit fixtures are high efficacy)	10 points	
	Very High Efficiency Lights (100% of in-unit fixtures are high efficacy)	12 points	
Appliances	Energy Star Refrigerator (new)	1 points	01
	Energy Star Dish Washer (new)	1 points	01
	Energy Star Washing Machine (new)	1 points	01

Feature	Description	Assigned Point Values	Project Points
Miscellaneous Residential Building Efficiencies			
Building Placement	North/South alignment of building or other building placement such that the orientation of the buildings optimizes natural heating, cooling, and lighting.	5 point	
Shading	At least 90% of south-facing glazing will be shaded by vegetation or overhangs at noon on Jun 21st.	4 Points	
Energy Star Homes	EPA Energy Star for Homes (version 3 or above)	25 points	
Independent Energy Efficiency Calculations	Provide point values based upon energy efficiency modeling of the Project. Note that engineering data will be required documenting the energy efficiency and point values based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	
Other	This allows innovation by the applicant to provide design features that increases the energy efficiency of the project not provided in the table. Note that engineering data will be required documenting the energy efficiency of innovative designs and point values given based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	
Existing Residential Retrofits	The applicant may wish to provide energy efficiency retrofit projects to existing residential dwelling units to further the point value of their project. Retrofitting existing residential dwelling units within the City is a key reduction measure that is needed to reach the reduction goal. The potential for an applicant to take advantage of this program will be decided on a case by case basis and must have the approval of the Ontario Planning Department. The decision to allow applicants to ability to participate in this program will be evaluated based upon, but not limited to the following; Will the energy efficiency retrofit project benefit low income or disadvantaged residents? Does the energy efficiency retrofit project fit within the overall assumptions in reduction measures associated with existing residential retrofits? Does the energy efficiency retrofit project provide co-benefits important to the City? Point value will be determined based upon engineering and design criteria of the energy efficiency retrofit project.	TBD	
Reduction Measure PS E2: Residential Renewable Energy Generation			
Photovoltaic	Solar Photovoltaic panels installed on individual homes or in collective neighborhood arrangements such that the total power provided augments:		
	Solar Ready Homes (sturdy roof and solar ready service panel)	2 points	
	10 percent of the power needs of the project	10 points	
	20 percent of the power needs of the project	15 points	
	30 percent of the power needs of the project	20 points	
	40 percent of the power needs of the project	28 points	
	50 percent of the power needs of the project	35 points	
	60 percent of the power needs of the project	38 points	
	70 percent of the power needs of the project	42 points	
	80 percent of the power needs of the project	46 points	

Feature	Description	Assigned Point Values	Project Points
	90 percent of the power needs of the project	52 points	
	100 percent of the power needs of the project	58 points	
Wind turbines	Some areas of the City lend themselves to wind turbine applications. Analysis of the area's capability to support wind turbines should be evaluated prior to choosing this feature. Individual wind turbines at homes or collective neighborhood arrangements of wind turbines such that the total power provided augments:		
	10 percent of the power needs of the project	10 points	
	20 percent of the power needs of the project	15 points	
	30 percent of the power needs of the project	20 points	
	40 percent of the power needs of the project	28 points	
	50 percent of the power needs of the project	35 points	
	60 percent of the power needs of the project	38 points	
	70 percent of the power needs of the project	42 points	
	80 percent of the power needs of the project	46 points	
	90 percent of the power needs of the project	52 points	
	100 percent of the power needs of the project	58 points	
Off-site renewable energy project	The applicant may submit a proposal to supply an off-site renewable energy project such as renewable energy retrofits of existing homes that will help implement renewable energy within the City. These off-site renewable energy retrofit project proposals will be determined on a case by case basis and must be accompanied by a detailed plan that documents the quantity of renewable energy the proposal will generate. Point values will be determined based upon the energy generated by the proposal.	TBD	
Other Renewable Energy Generation	The applicant may have innovative designs or unique site circumstances (such as geothermal) that allow the project to generate electricity from renewable energy not provided in the table. The ability to supply other renewable energy and the point values allowed will be decided based upon engineering data documenting the ability to generate electricity.	TBD	
Reduction Measure PS W1: Residential Water Conservation			
Irrigation and Landscaping			
Water Efficient Landscaping	Limit conventional turf to < 50% of required landscape area	0 points	08
	Limit conventional turf to < 25% of required landscape area	4 points	
	No conventional turf (warm season turf to < 50% of required landscape area and/or low water using plants are allowed)	6 points	
	Only California Native Plants that requires no irrigation or some supplemental irrigation	8 points	

Feature	Description	Assigned Point Values	Project Points
Water Efficient irrigation systems	Low precipitation spray heads < .75"/hr or drip irrigation Weather based irrigation control systems or moisture sensors (demonstrate 20% reduced water use)	2 point 3 points	02
Recycled Water	Recycled connections (purple pipe) to irrigation system on site	6 points	
Water Reuse	Gray water Reuse System collects Gray water from clothes washers, showers and faucets for irrigation use,	12 points	
Storm water Reuse Systems	Innovative on-site stormwater collection, filtration and reuse systems are being developed that provide supplemental irrigation water and provide vector control. These systems can greatly reduce the irrigation needs of a project. Point values for these types of systems will be determined based upon design and engineering data documenting the water savings.	TBD	As required by LID
Potable Water			
Showers	Water Efficient Showerheads (2.0 gpm)	3 points	03
Toilets	Water Efficient Toilets (1.5 gpm)	3 points	03
Faucets	Water Efficient faucets (1.28 gpm)	3 points	03
Dishwasher	Water Efficient Dishwasher (6 gallons per cycle or less)	1	01
Washing Machine	Water Efficient Washing Machine (Water factor <5.5)	1	01
WaterSense	EPA WaterSense Certification	12 points	
Reduction Measure PS T1: Land Use Based Trips and VMT Reduction			
Mixed Use	Mixes of land uses that complement one another in a way that reduces the need for vehicle trips can greatly reduce GHG emissions. The point value of mixed use projects will be determined based upon a Transportation Impact Analysis (TIA) demonstrating trip reductions and/or reductions in vehicle miles traveled. Suggested ranges: Diversity of land uses complementing each other (2-28 points) Increased destination accessibility other than transit (1-18 points) Increased transit accessibility (1-25 points) Infill location that reduces vehicle trips or VMT beyond the measures described above (points TBD based on traffic data).	TBD	
Residential Near Local Retail (Residential only Projects)	Having residential developments within walking and biking distance of local retail helps to reduce vehicle trips and/or vehicle miles traveled. The point value of residential projects in close proximity to local retail will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled (VMT)	TBD	

Feature	Description	Assigned Point Values	Project Points
Other Trip Reduction Measures	Other trip or VMT reduction measures not listed above with TIA and/or other traffic data supporting the trip and/or VMT for the project.	TBD	
Reduction Measure PS T2: Bicycle Master Plan			
Bicycle Infrastructure	Ontario's Bicycle Master Plan is extensive and describes the construction on 11.5 miles of Class I bike paths and 23 miles of Class II and Class III bikeways to build upon the current 8 miles of bikeways. Provide bicycle paths within project boundaries. Provide bicycle path linkages between residential and other land uses. Provide bicycle path linkages between residential and transit.	TBD 2 points 5 points	
Reduction Measure PS T3: Neighborhood Electric Vehicle Infrastructure			
Electric Vehicle Recharging	Provide circuit and capacity in garages of residential units for use by an electric vehicle. Charging stations are for on-road electric vehicles legally able to drive on all roadways including Interstate Highways and freeways. Install electric vehicle charging stations in the garages of residential units	1 point 8 points	08
Total Points Earned by Residential Project:			102

Without VMT or Mixed Use

Table 2: Screening Table for Implementation of GHG Reduction Measures for Commercial/Industrial Development

Feature	Description	Assigned Point Values	Project Points
Reduction Measure PS E3: Commercial/Industrial Energy Efficiency Development			
Building Envelope			
Insulation	2008 baseline (walls R-13; roof/attic R-30)	0 points	18
	Modestly Enhanced Insulation (walls R-13, roof/attic R-38))	15 points	
	Enhanced Insulation (rigid wall insulation R-13, roof/attic R-38)	18 points	
	Greatly Enhanced Insulation (spray foam insulated walls R-15 or higher, roof/attic R-38 or higher)	20 points	
	(Applies to the conditioned space, defined as those areas within the building that have air conditioning and heating.)		
Windows	2008 Baseline Windows (0.57 U-factor, 0.4 solar heat gain coefficient [SHGC])	0 points	07
	Modestly Enhanced Window Insulation (0.4 U-factor, 0.32 SHGC)	7 points	
	Enhanced Window Insulation (0.32 U-factor, 0.25 SHGC)	8 points	
	Greatly Enhanced Window Insulation (0.28 or less U-factor, 0.22 or less SHGC)	12 points	
	(Applies to the conditioned space, defined as those areas within the building that have air conditioning and heating.)		
Cool Roof	Modest Cool Roof (CRRC Rated 0.15 aged solar reflectance, 0.75 thermal emittance)	12 points	12
	Enhanced Cool Roof (CRRC Rated 0.2 aged solar reflectance, 0.75 thermal emittance)	14 points	
	Greatly Enhanced Cool Roof (CRRC Rated 0.35 aged solar reflectance, 0.75 thermal emittance)	16 points	
Air Infiltration	Minimizing leaks in the building envelope is as important as the insulation properties of the building. Insulation does not work effectively if there is excess air leakage.		12
	Air barrier applied to exterior walls, calking, and visual inspection such as the HERS Verified Quality Insulation Installation (QII or equivalent)	12 points	
	Blower Door HERS Verified Envelope Leakage or equivalent	10 points	
	(Applies to the conditioned space, defined as those areas within the building that have air conditioning and heating.)		
Thermal Storage of Building	Thermal storage is a design characteristic that helps keep a constant temperature in the building. Common thermal storage devices include strategically placed water filled columns, water storage tanks, and thick masonry walls.		

Feature	Description	Assigned Point Values	Project Points
	Modest Thermal Mass (10% of floor or 10% of walls 12" or more thick exposed concrete or masonry with no permanently installed floor covering such as carpet, linoleum, wood or other insulating materials)	4 points	04
	Enhanced Thermal Mass (20% of floor or 20% of walls 12" or more thick exposed concrete or masonry with no permanently installed floor covering such as carpet, linoleum, wood or other insulating materials)	6 points	
	Enhanced Thermal Mass (80% of floor or 80% of walls 12" or more thick exposed concrete or masonry with no permanently installed floor covering such as carpet, linoleum, wood or other insulating materials)	24 points	
Indoor Space Efficiencies			
Heating/ Cooling Distribution System	Minimum Duct Insulation (R-4.2 required)	0 points	08
	Modest Duct insulation (R-6)	8 points	
	Enhanced Duct Insulation (R-8)	10 points	
	Distribution loss reduction with inspection (HERS Verified Duct Leakage or equivalent) *(Applies to the conditioned space, defined as those areas within the building that have air conditioning and heating.)*	14 points	
Space Heating/ Cooling Equipment	2008 Minimum HVAC Efficiency (EER 13/60% AFUE or 7.7 HSPF)	0 points	07
	Improved Efficiency HVAC (EER 14/65% AFUE or 8 HSPF)	7 points	
	High Efficiency HVAC (EER 15/72% AFUE or 8.5 HSPF)	8 points	
	Very High Efficiency HVAC (EER 16/80% AFUE or 9 HSPF) *(Applies to the conditioned space, defined as those areas within the building that have air conditioning and heating.)*	12 points	
Commercial Heat Recovery Systems	Heat recovery strategies employed with commercial laundry, cooking equipment, and other commercial heat sources for reuse in HVAC air intake or other appropriate heat recovery technology. Point values for these types of systems will be determined based upon design and engineering data documenting the energy savings.	TBD	
Water Heaters	2008 Minimum Efficiency (0.57 Energy Factor)	0 points	14
	Improved Efficiency Water Heater (0.675 Energy Factor)	14 points	
	High Efficiency Water Heater (0.72 Energy Factor)	16 points	
	Very High Efficiency Water Heater (0.92 Energy Factor)	19 points	
	Solar Pre-heat System (0.2 Net Solar Fraction)	4 points	
	Enhanced Solar Pre-heat System (0.35 Net Solar Fraction)	8 points	
Daylighting	Daylighting is the ability of each room within the building to provide outside light during the day reducing the need for artificial lighting during daylight hours.		

Feature	Description	Assigned Point Values	Project Points
	All peripheral rooms within building have at least one window or skylight	1 points	
	All rooms within building have daylight (through use of windows, solar tubes, skylights, etc.)	5 points	05
	All rooms daylighted	7 points	
Artificial Lighting	2008 Minimum (required)	0 points	
	Efficient Lights (25% of in-unit fixtures considered high efficacy. High efficacy is defined as 40 lumens/watt for 15 watt or less fixtures; 50 lumens/watt for 15-40 watt fixtures, 60 lumens/watt for fixtures >40watt)	9 points	09
	High Efficiency Lights (50% of in-unit fixtures are high efficacy)	12 points	
	Very High Efficiency Lights (100% of in-unit fixtures are high efficacy)	14 points	
Appliances	Energy Star Commercial Refrigerator (new)	4 points	
	Energy Star Commercial Dish Washer (new)	4 points	12
	Energy Star Commercial Cloths Washing	4 points	
Miscellaneous Commercial/Industrial Building Efficiencies			
Building Placement	North/South alignment of building or other building placement such that the orientation of the buildings optimizes conditions for natural heating, cooling, and lighting.	6 point	
Shading	At least 90% of south-facing glazing will be shaded by vegetation or overhangs at noon on June 21st.	6 Points	
Other	This allows innovation by the applicant to provide design features that increases the energy efficiency of the project not provided in the table. Note that engineering data will be required documenting the energy efficiency of innovative designs and point values given based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	
Existing Commercial building Retrofits	The applicant may wish to provide energy efficiency retrofit projects to existing commercial buildings to further the point value of their project. Retrofitting existing commercial buildings within the City is a key reduction measure that is needed to reach the reduction goal. The potential for an applicant to take advantage of this program will be decided on a case by case basis and must have the approval of the Ontario Planning Department. The decision to allow applicants the ability to participate in this program will be evaluated based upon, but not limited to the following:	TBD	

Feature	Description	Assigned Point Values	Project Points
	Will the energy efficiency retrofit project benefit low income or disadvantaged communities? Does the energy efficiency retrofit project fit within the overall assumptions in the reduction measure associated with commercial building energy efficiency retrofits? Does the energy efficiency retrofit project provide co-benefits important to the City? Point value will be determined based upon engineering and design criteria of the energy efficiency retrofit project.		
Reduction Measure PS E4: Commercial/Industrial Renewable Energy			
Photovoltaic	Solar Photovoltaic panels installed on commercial buildings or in collective arrangements within a commercial development such that the total power provided augments:		
	Solar Ready Roofs (sturdy roof and electric hookups)	2 points	
	10 percent of the power needs of the project	8 points	
	20 percent of the power needs of the project	14 points	
	30 percent of the power needs of the project	20 points	
	40 percent of the power needs of the project	26 points	
	50 percent of the power needs of the project	32 points	
	60 percent of the power needs of the project	38 points	
	70 percent of the power needs of the project	44 points	
	80 percent of the power needs of the project	50 points	
	90 percent of the power needs of the project	56 points	
	100 percent of the power needs of the project	60 points	
Wind turbines	Some areas of the City lend themselves to wind turbine applications. Analysis of the areas capability to support wind turbines should be evaluated prior to choosing this feature. Wind turbines as part of the commercial development such that the total power provided augments:		
	10 percent of the power needs of the project	8 points	
	20 percent of the power needs of the project	14 points	
	30 percent of the power needs of the project	20 points	
	40 percent of the power needs of the project	26 points	
	50 percent of the power needs of the project	32 points	
	60 percent of the power needs of the project	38 points	
	70 percent of the power needs of the project	44 points	

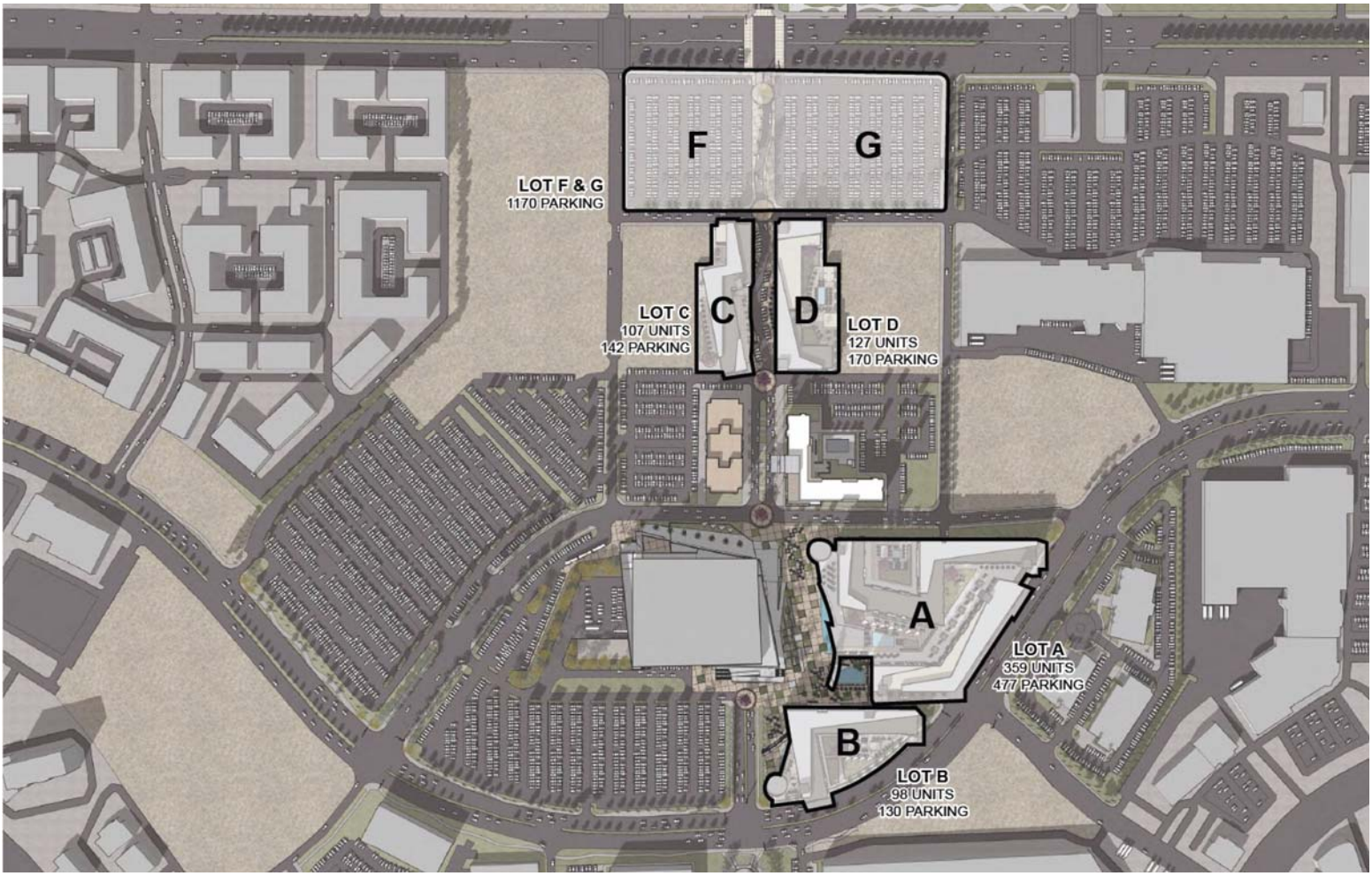
Feature	Description	Assigned Point Values	Project Points
	80 percent of the power needs of the project 90 percent of the power needs of the project 100 percent of the power needs of the project	50 points 56 points 60 points	
Off-site renewable energy project	The applicant may submit a proposal to supply an off-site renewable energy project such as renewable energy retrofits of existing commercial/industrial that will help implement reduction measures associated with existing buildings. These off-site renewable energy retrofit project proposals will be determined on a case by case basis accompanied by a detailed plan documenting the quantity of renewable energy the proposal will generate. Point values will be based upon the energy generated by the proposal.	TBD	
Other Renewable Energy Generation	The applicant may have innovative designs or unique site circumstances (such as geothermal) that allow the project to generate electricity from renewable energy not provided in the table. The ability to supply other renewable energy and the point values allowed will be decided based upon engineering data documenting the ability to generate electricity.	TBD	
Reduction Measure PS W2: Commercial/Industrial Water Conservation			
Irrigation and Landscaping			
Water Efficient Landscaping	Eliminate conventional turf from landscaping Only moderate water using plants Only low water using plants Only California Native landscape that requires no or only supplemental irrigation	0 points 3 points 4 points 8 points	08
Trees	Increase tree planting in parking areas 50% beyond City Code requirements	TBD	
Water Efficient irrigation systems	Low precipitation spray heads< .75"/hr or drip irrigation Weather based irrigation control systems combined with drip irrigation (demonstrate 20 reduced water use)	1 point 5 points	01
Recycled Water	Recycled water connection (purple pipe)to irrigation system on site	5 points	
Storm water Reuse Systems	Innovative on-site stormwater collection, filtration and reuse systems are being developed that provide supplemental irrigation water and provide vector control. These systems can greatly reduce the irrigation needs of a project. Point values for these types of systems will be determined based upon design and engineering data documenting the water savings.	TBD	

Feature	Description	Assigned Point Values	Project Points
Potable Water			
Showers	Water Efficient Showerheads (2.0 gpm)	3 points	
Toilets	Water Efficient Toilets/Urinals (1.5gpm) Waterless Urinals (note that commercial buildings having both waterless urinals and high efficiency toilets will have a combined point value of 6 points)	3 points 4 points	07
Faucets	Water Efficient faucets (1.28gpm)	3 points	03
Commercial Dishwashers	Water Efficient dishwashers (20% water savings)	4 points	04
Commercial Laundry Washers	Water Efficient laundry (15% water savings) High Efficiency laundry Equipment that captures and reuses rinse water (30% water savings)	3 points 6 points	
Commercial Water Operations Program	Establish an operational program to reduce water loss from pools, water features, etc., by covering pools, adjusting fountain operational hours, and using water treatment to reduce draw down and replacement of water. Point values for these types of plans will be determined based upon design and engineering data documenting the water savings.	TBD	
Reduction Measure PS T1: Land Use Based Trips and VMT Reduction			
Mixed Use	Mixes of land uses that complement one another in a way that reduces the need for vehicle trips can greatly reduce GHG emissions. The point value of mixed use projects will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled	TBD	
Local Retail Near Residential (Commercial only Projects)	Having residential developments within walking and biking distance of local retail helps to reduce vehicle trips and/or vehicle miles traveled. The point value of residential projects in close proximity to local retail will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled	TBD	
Reduction Measure PS T2: Bicycle Master Plan			
Bicycle Infrastructure	Ontario's Bicycle Master Plan is extensive and describes the construction on 11.5 miles of Class I bike paths and 23 miles of Class II and Class III bikeways to build upon the current 8 miles of bikeways. Provide bicycle paths within project boundaries. Provide bicycle path linkages between project site and other land uses. Provide bicycle path linkages between project site and transit.	TBD TBD 2 points 5 points	

Feature	Description	Assigned Point Values	Project Points
Reduction Measure PS T3: Electric Vehicle Infrastructure			
Electric Vehicles	Provide public charging station for use by an electric vehicle. *(ten points for each charging station within the facility)*	10 points	10
Reduction Measure PS T4: Employee Based Trip &VMT Reduction Policy			
Compressed Work Week	Reduce the number of days per week that employees need to be on site will reduce the number of vehicle trips associated with commercial/industrial development. Compressed work week such that full time employees are on site: 5 days per week 4 days per week on site 3 days per week on site	TBD	
Car/Vanpools	Car/vanpool program Car/vanpool program with preferred parking Car/vanpool with guaranteed ride home program Subsidized employee incentive car/vanpool program Combination of all the above	TBD	
Employee Bicycle/ Pedestrian Programs	Complete sidewalk to residential within ½ mile Complete bike path to residential within 3 miles Bike lockers and secure racks Showers and changing facilities Subsidized employee walk/bike program (Note combine all applicable points for total value)	TBD	
Shuttle/Transit Programs	Local transit within ¼ mile Light rail transit within ½ mile Shuttle service to light rail transit station Guaranteed ride home program Subsidized Transit passes Note combine all applicable points for total value	TBD	
CRT	Employer based Commute Trip Reduction (CRT). CRTs apply to commercial, offices, or industrial projects that include a reduction of vehicle trip or VMT goal using a variety of employee commutes trip reduction methods. The point value will be determined based upon a TIA that demonstrates the trip/VMT reductions. Suggested point ranges: Incentive based CRT Programs (1-8 points) Mandatory CRT programs (5-20 points)	TBD	
Other Trip Reductions	Other trip or VMT reduction measures not listed above with TIA and/or other traffic data supporting the trip and/or VMT for the project.	TBD	
Total Points from Commercial/Industrial Project:			141

APPENDIX C
NOISE IMPACT STUDY

TOYOTA ARENA MIXED-USE DEVELOPMENT
NOISE IMPACT STUDY
City of Ontario



TOYOTA ARENA MIXED-USE DEVELOPMENT
NOISE IMPACT STUDY
City of Ontario, California

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May 28, 2021

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1.0 Introduction

1.1 Purpose of Analysis and Study Objectives

The purpose of this report is to evaluate the potential noise impacts from the proposed Toyota Arena Mixed-Use Development (project) and provide recommendations, if necessary, to minimize any project noise impacts. The assessment was conducted within the context of the California Environmental Quality Act (CEQA) and utilizes the noise standards set forth by the applicable Federal, State, and local agencies.

The following is provided in this report:

- A description of the study area and the proposed project
- Information regarding the fundamentals of noise
- Identification of the regulatory setting and applicable noise standards
- Analysis of the existing noise environment
- Analysis of the project's operational noise impact to adjacent receptors
- Analysis of the project's construction noise and vibration impact to adjacent sensitive receptors
- Summary of recommended mitigation measures and project design features to reduce noise level impacts.

1.2 Site Location

The proposed Toyota Arena Mixed-Use Development project site is located adjacent to the Toyota Arena, north of Concourse Street and south of Fourth Street, in the City of Ontario. The project site is located approximately 1,013 feet above sea level and the topography is relatively flat.

The project site location map is provided in Exhibit A.

The project site is located within the Ontario Center Specific Plan and zoned for Urban Commercial use. The City of Ontario General Plan land use map designates the project site as Mixed Use.

1.3 Project Description

The project consists of construction and operation of a mixed use town center development with residential and commercial/retail land use within four development lots.

The proposed project includes a total of 691 residential dwelling units, 71,200 square feet of commercial/retail uses and the demolition and relocation of approximately 1,170 surface parking spaces. The total project site area is approximately 18.73 acres.

The site plan used for this analysis, provided by the applicant, is illustrated in Exhibit B. Table 1 summarizes the proposed project land uses.

Table 1
Land Use Summary

Lot	Dwelling Units	Retail (SF)[1]	Parking Spaces
A	359	25,256	477[2]
B	98	20,802	130[2]
C	107	11,047	142[2]
D	127	14,095	170[2]
F & G	--	--	1,170
Total	691	71,200	2,089

[1] S.F. – Square Feet
[2] Parking Structure

This report analyzes long-term and short-term noise impacts associated with the day-to-day operation of the project. The primary sources of long-term noise impacts would be on-site circulation and parking lot noise and HVAC units.

1.4 Summary of Analysis Results

Table 2 provides a summary of the noise analysis results, per the CEQA impact criteria checklist. With the implementation of the recommended mitigation measures, the project is not expected to result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Table 2
CEQA Noise Impact Criteria

Noise Impact Criteria	Potentially Significant	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
Would the project result in?				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X	
b) Generation of excessive groundborne vibration or groundborne noise levels?			X	
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?			X	

1.5 Recommended Project Design Features

The following recommended project design features include standard rules and requirements, best practices and recognized design guidelines for reducing noise levels. Design features are assumed to be part of the conditions of the project and integrated into its design. Design features are not typically considered mitigation under CEQA.

Operational Design Features

DF-1 Prior to the issuance of building permits, the project shall prepare a final acoustical study that demonstrates building construction will achieve the minimum interior noise standard of 45 dBA CNEL for all residential units located along arterial roadways and/or adjacent to industrial uses, per the California Building Standards Code. The following noise control measures may be required for dwelling units located near adjacent roadways and industrial uses:

- Install sound barriers between residences and noise sources.
- Install double-paned or similar sound rated windows.

- Provide sound insulating exterior walls and roofing systems.
- Locate and/or design attic vents to minimize sound propagation into each home.
- Provide forced-air ventilation systems.
- Place dwellings as far as practical from the noise source

DF-2 The project shall comply with California Title 24 building insulation requirements for exterior walls, roofs and common separating assemblies (e.g. floor/ceiling assemblies and demising walls).

DF-3 For proper acoustical performance, all exterior windows, doors, and sliding glass doors should have a positive seal and leaks/cracks must be kept to a minimum.

DF-4 The final building plans shall ensure that HVAC units are not located within an area of the project site that would contribute to a noise level exceedance at any adjacent property line, per the City of Ontario Municipal Code requirements. To meet the City's noise standards the following measures should be followed:

- All HVAC equipment shall be shielded or enclosed from the line of sight of adjacent residential uses.

Construction Design Features

DF-5 Prepare a construction management plan and obtain a construction work permit from the City of Ontario prior to starting construction. The construction management plan shall ensure all contractors implement construction best management practices to reduce construction noise levels. Best management practices shall include the following:

- All construction equipment shall be equipped with muffles and other suitable noise attenuation devices (e.g., engine shields).

- Grading and construction contractors shall use quieter equipment as opposed to noisier equipment (such as rubber-tired equipment rather than track equipment), to the maximum extent feasible.

- If feasible, electric hook-ups shall be provided to avoid the use of generators. If electric service is determined to be infeasible for the site, only whisper-quiet generators shall be used (i.e., inverter generators capable of providing variable load.

- Use electric air compressors and similar power tools rather than diesel equipment, where feasible.

- Locate staging area, generators and stationary construction equipment as far from the adjacent residential homes as feasible.

- Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 5 minutes.

- Provide notifications and signage in readily visible locations along the perimeter of construction sites that indicate the dates and duration of construction activities, as well as provide a telephone number where neighbors can enquire about the construction process and register complaints to a designated construction noise disturbance coordinator.

- Construction activities shall not take place between the hours of 6:00 p.m. and 7:00 a.m. on weekdays and Saturday or Sunday between the hours of 9:00 a.m. and 6:00 p.m.

DF-6 No impact pile driving or blasting activities shall be permitted on the project site during construction. If impact pile driving or blasting is required, a follow-up noise and vibration impact assessment shall be conducted prior to start of any activity.

2.0 Fundamentals of Noise

This section of the report provides basic information about noise and vibration and presents some of the terms used in the report.

2.1 Sound, Noise, and Acoustics

The sound is a disturbance created by a moving or vibrating source and is capable of being detected by the hearing organs. The sound may be thought of as mechanical energy of a moving object transmitted by pressure waves through a medium to a human ear. For traffic or stationary noise, the medium of concern is air. *Noise* is defined as sound that is loud, unpleasant, unexpected, or unwanted.

2.2 Frequency and Hertz

A continuous sound is described by its *frequency* (pitch) and its *amplitude* (loudness). Frequency relates to the number of pressure oscillations per second. Low-frequency sounds are low in pitch (bass sounding) and high-frequency sounds are high in pitch (squeak). These oscillations per second (cycles) are commonly referred to as Hertz (Hz). The human ear can hear from the bass pitch starting out at 20 Hz all the way to the high pitch of 20,000 Hz.

2.3 Sound Pressure Levels and Decibels

The *amplitude* of a sound determines its loudness. The loudness of sound increases or decreases, as the amplitude increases or decreases. Sound pressure amplitude is measured in units of micro-Newton per square inch meter (N/m2), also called micro-Pascal (μPa). One μPa is approximately one hundred billionths (0.00000000001) of normal atmospheric pressure. Sound pressure level (SPL or L_p) is used to describe in logarithmic units the ratio of actual sound pressures to a reference pressure squared. These units are called decibels and abbreviated as dB.

2.4 Addition of Decibels

Because decibels are on a logarithmic scale, sound pressure levels cannot be added or subtracted by simple plus or minus addition. When two (2) sounds of equal SPL are combined, they will produce an SPL 3 dB greater than the original single SPL. In other words, sound energy must be doubled to produce a 3dB increase.

If two (2) sounds differ by approximately 10 dB the higher sound level is the predominant sound.

2.5 Human Response to Changes in Noise Levels[1]

In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, (A-weighted scale) and it perceives a sound within that range as being more intense than a sound with a higher or lower frequency with the same magnitude. For purposes of this report as well as with most environmental documents, the A-scale weighing is typically reported in terms of A-weighted decibel (dBA). Typically, the human ear can barely perceive the change in the noise level of 3 dB. A change in 5 dB is readily perceptible, and a change in 10 dB is perceived as being twice or half as loud. As previously discussed, a doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g. doubling the volume of traffic on a highway), would result in a barely perceptible change in sound level.

2.6 Noise Descriptors

Noise in our daily environment fluctuates over time. Some noise levels occur in regular patterns, others are random. Some noise levels are constant, while others are sporadic. Noise descriptors were created to describe the different time-varying noise levels. Following are the most commonly used noise descriptors along with brief definitions.

A-Weighted Sound Level

The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high-frequency components of the sound in a manner similar to the response of the human ear. A numerical method of rating human judgment of loudness.

Ambient Noise Level

The composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

[1] Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013.

Community Noise Equivalent Level (CNEL)

The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five (5) decibels to sound levels in the evening from 7:00 to 10:00 PM and after addition of ten (10) decibels to sound levels in the night before 7:00 AM and after 10:00 PM.

Decibel (dB)

A unit for measuring the amplitude of a sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micro-pascals.

dB(A)

A-weighted sound level (see definition above).

Equivalent Sound Level (LEQ)

The sound level corresponding to a steady noise level over a given sample period with the same amount of acoustic energy as the actual time-varying noise level. The energy average noise level during the sample period.

Habitable Room

Any room meeting the requirements of the Uniform Building Code or other applicable regulations which is intended to be used for sleeping, living, cooking or dining purposes, excluding such enclosed spaces as closets, pantries, bath or toilet rooms, service rooms, connecting corridors, laundries, unfinished attics, foyers, storage spaces, cellars, utility rooms, and similar spaces.

L(n)

The A-weighted sound level exceeded during a certain percentage of the sample time. For example, L10 in the sound level exceeded 10 percent of the sample time. Similarly, L50, L90, and L99, etc.

Noise

Any unwanted sound or sound which is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying. The State Noise Control Act defines noise as "...excessive undesirable sound...".

Percent Noise Levels

See L(n).

Sound Level (Noise Level)

The weighted sound pressure level obtained by use of a sound level meter having a standard frequency-filter for attenuating part of the sound spectrum.

Sound Level Meter

An instrument, including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement and determination of noise and sound levels.

Single Event Noise Exposure Level (SENEL)

The dBA level which, if it lasted for one (1) second, would produce the same A-weighted sound energy as the actual event.

2.7 Sound Propagation

As sound propagates from a source it spreads geometrically. The sound from a small, localized source (i.e., a point source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates at a rate of 6 dB per doubling of distance. The movement of vehicles down a roadway makes the source of the sound appear to propagate from a line (i.e., line source) rather than a point source. This line source results in the noise propagating from a roadway in a cylindrical spreading versus a spherical spreading that results from a point source. The sound level attenuates for a line source at a rate of 3 dB per doubling of distance.

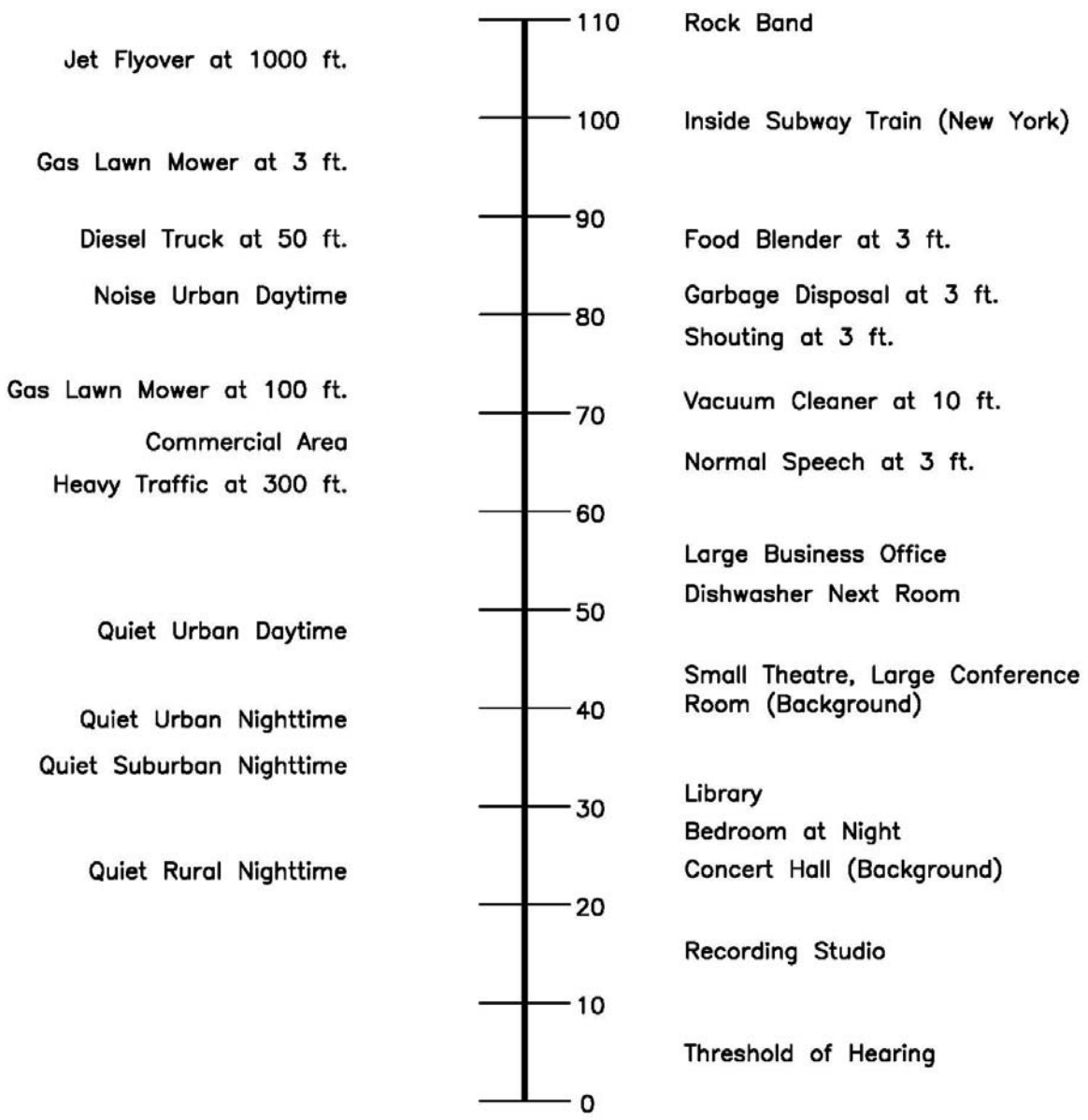
As noise propagates from the source, it is affected by the ground and atmosphere. Noise models use the hard site (reflective surfaces) and soft site (absorptive surfaces) to help calculate predicted noise levels. Hard site conditions assume no excessive ground absorption between the noise source and the receiver. Soft site conditions such as grass, soft dirt or landscaping attenuate noise at an additional rate of 1.5 dB per doubling of distance. When added to the geometric spreading, the excess ground attenuation results in an overall noise attenuation of 4.5 dB per doubling of distance for a line source and 6.0 dB per doubling of distance for a point source.

Research has demonstrated that atmospheric conditions can have a significant effect on noise levels when noise receivers are located 200 feet and greater from a noise source. Wind, temperature, air humidity, and turbulence can further impact how far sound can travel.

Figure 1 shows typical sound levels from indoor and outdoor noise sources.

Figure 1[2]

TYPICAL SOUND LEVELS FROM
INDOOR AND OUTDOOR NOISE SOURCES



[2] Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013.

2.8 Vibration Descriptors

Ground-borne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically only cause a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Ground-borne noise is an effect of ground-borne vibration and only exists indoors since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

Several different methods are used to quantify vibration amplitude.

PPV

Known as the peak particle velocity (PPV) which is the maximum instantaneous peak in vibration velocity, typically given in inches per second.

RMS

Known as the root mean squared (RMS) can be used to denote vibration amplitude.

VdB

A commonly used abbreviation to describe the vibration level (VdB) for a vibration source.

2.9 Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Outdoor sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration. To counter the effects of ground-borne vibration, the Federal Transit Administration (FTA) has published guidance relative to vibration impacts.

2.10 Vibration Propagation

There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wavefront, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wavefront. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wavefront. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

2.11 Construction Related Vibration Level Prediction[3]

Operational activities are separated into two different categories. The vibration can be transient or continuous in nature. Each category can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the project area site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. The thresholds from Caltrans Transportation and Construction Vibration Guidance Manual, April 2020, in the table below provide general guidelines as to the maximum vibration limits for when vibration becomes potentially annoying.

[3] Caltrans Transportation and Construction Vibration Guidance Manual, April 2020

Table 3
Vibration Annoyance Potential Criteria

Human Response	PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.90	0.10
Severe	2.00	0.40

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

The Caltrans Transportation and Construction Vibration Guidance Manual, April 2020 provides general thresholds and guidelines as to the vibration damage potential from vibratory impacts. The table below provides general vibration damage potential thresholds:

Table 4
Vibration Damage Potential Threshold Criteria

Structure and Condition	PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings ruin ancient monuments	0.12	0.08
Fragile buildings	0.20	0.10
Historic and some old buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial/commercial buildings	2.00	0.50

Soil conditions have an impact on how vibration propagates through the ground. The Caltrans Transportation and Construction Vibration Guidance Manual, April 2020 provides suggested "n" values based on soil class. The table below outlines the manual's suggested values and description.

Table 5
Suggested "n" Values Based on Soil Classes

Soil Class	Description of Soil Material	Suggested Value of "n"
I	Weak or soft soils: loose soils, dry or partially saturated peat and muck, mud, loose beach sand, and dune sand.	1.4
II	Most sands, sandy clays, silty clays, gravel, silts, weathered rock.	1.3
III	Hard soils: densely compacted sand, dry consolidated clay, consolidated glacial till, some exposed rock.	1.1
IV	Hard, component rock: bedrock, freshly exposed hard rock.	1.0

3.0 Regulatory Setting

The proposed project is located in the City of Ontario and noise regulations are addressed through the various federal, state, and local government agencies. The agencies responsible for regulating noise are discussed below.

3.1 Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three (3) purposes:

- Publicize noise emission standards for interstate commerce
- Assist state and local abatement efforts
- Promote noise education and research

The Federal Office of Noise Abatement and Control (ONAC) was originally tasked with implementing the Noise Control Act. However, it was eventually eliminated leaving other federal agencies and committees to develop noise policies and programs. Some examples of these agencies are as follows: The Department of Transportation (DOT) assumed a significant role in noise control through its various agencies. The Federal Aviation Agency (FAA) is responsible to regulate noise from aircraft and airports. The Federal Highway Administration (FHWA) is responsible to regulate noise from the interstate highway system. The Occupational Safety and Health Administration (OSHA) is responsible for the prohibition of excessive noise exposure to workers.

The Federal government and the State advocate that local jurisdiction use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being constructed adjacent to a highway or, or alternatively that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the Federal government and the State have preempted the setting of standards for noise levels that can be emitted by the transportation source, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

3.2 State Regulations

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regularity tools to control and abate noise for use by local agencies. One significant model is the "Land Use Compatibility for Community Noise Environments Matrix." The matrix allows the local jurisdiction to clearly delineate compatibility of sensitive uses with various incremental levels of noise.

The State of California has established noise insulation standards as outlined in Title 24 and the Uniform Building Code (UBC) which in some cases requires acoustical analyses to outline exterior noise levels and to ensure interior noise levels do not exceed the interior threshold. The State mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

Noise insulation design standards for residences have been established by the State of California Uniform Building Code (UBC) Chapter 12, Division II and by the Title 24 noise insulation standards of the California Administrative Code. The City is required by the State Housing Law to adopt these State codes as minimum performance standards. The City may enact stricter noise standards throughout the city or on a case-by-case basis if deemed necessary. In brief, the Title 24 noise standards require the following for multi-family dwellings:

1. Party wall and floor-ceiling assembly designs must provide a minimum STC of 50, based on lab tests. Field tested assemblies must provide a minimum noise isolation class (NIC) of 45.

2. Floor-ceiling assembly designs must provide for a minimum impact insulation class (IIC) of 50, based on lab tests. Field tested assemblies must provide a minimum FIIC of 45.

3. Entry doors from interior corridors must provide an STC of 26 or more.

4. Penetrations or openings in sound rated assemblies must be treated to maintain required ratings.

5. Interior noise levels due to exterior sources must not exceed a community noise equivalent level (CNEL) or a day-night level (LDN) of 45 dBA, in any habitable room.

Thus, the interior limit is 45 dBA CNEL between dwelling units and from exterior noise sources to interior living spaces.

3.3 City of Ontario Noise Regulations

The project is required to comply with the noise standards and thresholds established within the City of Ontario Municipal Code and the Ontario Plan. The noise standards from the Municipal Code and the Ontario Plan are provided in Appendix A.

3.3.1 City of Ontario Municipal Code Noise Standards

The City of Ontario Municipal Code, Chapter 29: Noise, requires that a project shall not create loud, unnecessary, or unusual noise that disturbs the peace or quiet of any neighborhood, or that causes discomfort or annoyance to any person of normal sensitiveness.

Exterior Noise Standards:

Noise standards are defined in Section 5-29.04, Exterior Noise Standards of the Noise chapter of the Municipal Code and are applicable to the project site and surrounding noise sensitive uses.

Table 6 shows the exterior noise standards from the City of Ontario Municipal Code Chapter 29: Noise Exterior Noise Standards for the project site and surrounding residential land uses.

Table 6
City of Ontario Municipal Code Exterior Noise Standards

Land Use	7:00 AM – 10:00 PM	10:00 PM – 7:00 AM
	Leq (dBA)	Leq (dBA)
Multi-Family Residential	65	50
Residential Portion of Mixed Use	70	70
Commercial Property	65	60

[1]Applies to that portion of residential property falling within 100 feet of a commercial property use, if the noise originates from that commercial property use.

Interior Noise Standards:

Noise standards are defined in Section 5-29.05 Interior Noise Standards of the Noise chapter of the Municipal Code and are applicable to the project site and surrounding noise sensitive uses.

Table 7 shows the exterior noise standards from the City of Ontario Municipal Code Chapter 29: Noise Interior Noise Standards for the project land uses.

Table 7
City of Ontario Municipal Code Interior Noise Standards

Land Use	7:00 AM – 10:00 PM	10:00 PM – 7:00 AM
	Leq (dBA)	Leq (dBA)
Multi-Family Residential	45	40
Residential Portion of Mixed Use[1]	45	40

[1]Applies to that portion of residential property falling within 100 feet of a commercial property use, if the noise originates from that commercial property use.

Construction Noise Regulations

Chapter 29: Noise, Section 5-29.06 of the City's municipal code states that the following activities shall be exempted from the provisions of the noise code;

- Noise sources associated with construction, repair, remodeling, demolition or grading of any real property. Such activities shall instead be subject to the following provisions of § 5-29.09;

  i. No person, while engaged in construction, remodeling, digging, grading, demolition or any other related building activity, shall operate any tool, equipment or machine in a manner that produces loud noise that disturbs a person of normal sensitivity who works or resides in the vicinity, or a Police or Code Enforcement Officer, on any weekday except between the hours of 7:00 a.m. and 6:00 p.m. or on Saturday or Sunday between the hours of 9:00 a.m. and 6:00 p.m.

  ii. No landowner, construction company owner, contractor, subcontractor, or employer shall permit or allow any person or persons working under their

direction and control to operate any tool, equipment or machine in violation of the provisions of this section.

3.3.2 City of Ontario General Plan (The Ontario Plan)

The Ontario Plan establishes planning criteria for determining a development's noise/land use compatibility based on the community noise equivalent level (CNEL). CNEL noise levels are typically used to evaluate mobile source noise impacts such as from roadways, airports and rail lines.

Table 8 summarizes the City's Noise/Land Use Compatibility guidelines for the project and surrounding land uses.

Table 8
Noise/Land Use Compatibility Guidelines

Land Use	Noise Limit (CNEL)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential – Multiple Family	<60	60-65	65-75	>75
Commercial – Retail	<70	70-75	75-80	>80

Clearly Acceptable: No special noise insulation required, assuming buildings of normal conventional construction.

Normally Acceptable: Acoustical reports will be required for major new residential construction. Conventional construction with closed windows and fresh air supply systems of air conditioning will normally suffice.

Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included.

Clearly Unacceptable: No new construction should be permitted.

4.0 Study Method and Procedures

The following section describes the measurement procedures, measurement locations, and noise modeling procedures and assumptions used in the noise analysis.

4.1 Measurement Procedures and Criteria

Noise measurements are taken to determine the existing noise levels. A noise receiver or receptor is any location in the noise analysis in which noise might produce an impact. The following criteria are used to select measurement locations and receptors:

- Locations expected to receive the highest noise impacts, such as the first row of houses
- Locations that are acoustically representative and equivalent of the area of concern
- Human land usage
- Sites clear of major obstruction and contamination

RK conducted the sound level measurements in accordance with Caltrans technical noise specifications. All measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (S1.4: Specification of Sound Level Meters, 1983).

A Piccolo-II Type 2 integrating-averaging level meter was used to conduct long-term (24-hour) noise measurements at the project site and property boundaries.

The Leq, Lmin, Lmax, L2, L8, L25, and L50 statistical data were recorded over the measurement time period intervals and the information was utilized to define the noise characteristics for the project. The following gives a brief description of the Caltrans Technical Noise Supplement procedures for sound level measurements:

- Microphones for sound level meters were placed five (5) feet above the ground for long-term noise measurements
- Sound level meters were calibrated before and after each measurement
- Following the calibration of equipment, a windscreen was placed over the microphone
- Frequency weighting was set on "A" and slow response
- Temperature and sky conditions were observed and documented

Appendix B includes photos, field sheets, and measured noise data.

4.2 Stationary Noise Modeling

The stationary noise was projected using a computer program that replicates the FHWA Noise Prediction Model (FHWA-RD-77-108). The FHWA model arrives at the predicted noise level through a series of adjustments to the reference energy noise level. For stationary source, the following noise level was applied to the model. The model outputs the projected noise level based on the following key parameters:

- Referenced noise level – (e.g. how loud a source is at a specific distance)
- Vertical and horizontal distances (sensitive receptor distance from noise source)
- Noise barrier vertical and horizontal distances (noise barrier distance from sound source and receptor).
- Typical noise source spectra
- Topography

Table 9 indicates the referenced noise level used in this analysis.

Table 9
Stationary Source Noise Level

Source	Distance from Source (feet)	Noise Levels (dBA)
		Leq
HVAC Condenser Unit	3.0	77.0
Parking Lot	6.0	63.8

To estimate the future noise levels during typical conditions, RK adjusted the reference noise levels from noise source to the nearest receptors. Adjusted noise levels are based on the distance of the receptor location relative to the noise source and local topography. The noise levels assume that the stationary sources are operating continuously when in reality not all noise sources will operate continuously throughout the day and night.

4.3 Construction Noise Modeling

The construction noise analysis utilizes the Federal Highway Administration (FHWA) Roadway Construction Noise Model, together with several key construction parameters. Key inputs include distance to the sensitive receiver, equipment usage, and baseline

parameters for the project site. This study evaluates the potential exterior noise impacts during each phase of construction. Noise levels were projected at an average distance of 160 feet to the nearest residential (to the north of Log F and Lot G) sensitive receptor of equipment operating over an 8-hour period from to the nearest sensitive receptor property line

- Construction phasing and equipment usage assumptions are referenced from the Toyota Arena Mixed Use Development AQ & GHG Study, by RK Engineering, June 2021.

4.4 Interior Noise Modeling

The interior noise level is the difference between the projected exterior noise level at the structure's façade and the noise reduction provided by the structure itself. Typical building construction will provide a conservative 12 dBA noise level reduction with a "windows open" condition and a very conservative 20 dBA noise level reduction with "windows closed". RK estimated the interior noise level by subtracting the building shell design from the estimated exterior noise level.

The interior noise analysis is based on industry standards for building noise reduction established by the Federal Highway Administration (FHWA), the 2013 Caltrans Technical Noise Supplement to the Traffic Noise Analysis Protocol (TeNS), the California Office of Noise Control Catalog of STC and IIC Ratings for Wall and Floor/Ceiling Assemblies, and the California Building Standards Code, Title 24.

The TeNS manual shows that the noise reduction due to building exteriors with ordinary sash windows (windows closed) is at least 20 decibels. By providing upgraded STC rated windows, the project design is considered adequate to meet interior noise standards. The building's exterior walls will be constructed per the latest building code insulation requirements and provide occupants with the most protection from exterior noise. Insulated exterior walls, designed per the latest California Building Standards, would provide a minimum of STC 35-40. Windows, on the other hand, are one of the acoustically weakest parts of the structure. Therefore, for a conservative estimate of preliminary interior noise, the building's noise reduction potential is limited to the STC of the windows.

4.5 Construction Vibration Modeling

The construction vibration assessment is based on the methodology set-forth within the Caltrans Transportation and Construction Induced Vibration Guidance Manual. The

vibration impacts from vibratory rollers and compactors, heavy truck loading and bulldozer activity is analyzed. All vibratory activity is analyzed as a continuous and/or frequent event and is required to comply with the applicable guidance thresholds criteria. It is expected that vibration levels will be highest during paving phase. No impact pile driving is expected as part of this project.

Vibratory impacts were calculated from the site area property line to the closest sensitive receptors and structures using the reference vibration levels, soil conditions and the reference equation *PPV= PPV ref (25/D)^n (in/sec)* (from Caltrans Manual) where:

PPV = reference measurement at 25 feet from vibration source
D = distance from equipment to property line
n= vibration attenuation rate through ground (n=1.0 was utilized for this study)

5.0 Existing Noise Environment

The existing noise environment for the project site and surrounding area has been established based on noise measurement data collected by RK.

5.1 Long-Term (24-Hour) Noise Measurement Results

To determine the existing noise level environment, RK conducted four (4) 24-hour noise measurements at the project study area.

Noise levels were measured on April 7, 2021 using a Piccolo-II Type 2 integrating-averaging sound level meter. The information was utilized to establish the noise characteristics of the existing ambient environment.

The noise monitoring locations were selected based on the proximity and location to adjacent sensitive receptors. Exhibit C graphically illustrates the location of the long-term measurements.

- Long-term noise monitoring location one (LT-1) was taken along southwest corner of Fourth Street and Via Piemonte approximately 140 feet south of the centerline of Fourth Street.

- Long-term noise monitoring location two (LT-2) was taken east of Porsche Way, approximately 60 feet north of the La Quinta Inn property line.

- Long-term noise monitoring location three (LT-3) was taken northwest corner of Concours Street and Ferrari Street, approximately 110 feet to the west from the centerline of Concours Street.

- Long-term noise monitoring location four (LT-4) was taken in the parking lot, approximately 450 feet to the north from the centerline of Concours Street.

Long term noise monitoring locations represent the existing noise levels near the adjacent noise sensitive land uses. Long-term noise measurement results are summarized in Table 10, Table 11, Table 12 and Table 13. Appendix B includes photographs, field sheets and measured noise data.

Table 10
24 Noise Measurement Results LT-1[1]

Time	Leq (dBA)	Time	Leq (dBA)
12:00 AM	52.5	12:00 PM	58.9
1:00 AM	49.3	1:00 PM	59.5
2:00 AM	50.7	2:00 PM	57.4
3:00 AM	51.5	3:00 PM	58.4
4:00 AM	53.4	4:00 PM	62.6
5:00 AM	59.2	5:00 PM	59.9
6:00 AM	58.2	6:00 PM	59.8
7:00 AM	59.1	7:00 PM	58.6
8:00 AM	57.4	8:00 PM	58.2
9:00 AM	55.3	9:00 PM	56.2
10:00 AM	58.6	10:00 PM	55.1
11:00 AM	57.8	11:00 PM	51.8
24-Hour CNEL			**62.5**

[1] LT-1 was taken along southwest corner of Fourth Street and Via Piemonte approximately 140 feet south of the centerline of Fourth Street. LT-1 was recorded on 04/07/2021.

Table 11
24 Noise Measurement Results, LT-2[1]

Time	Leq (dBA)	Time	Leq (dBA)
12:00 AM	50.1	12:00 PM	50.2
1:00 AM	49.4	1:00 PM	50.8
2:00 AM	49.7	2:00 PM	52.3
3:00 AM	50.5	3:00 PM	52.8
4:00 AM	49.5	4:00 PM	53.8
5:00 AM	57.7	5:00 PM	53.4
6:00 AM	54.7	6:00 PM	52.1
7:00 AM	53.0	7:00 PM	52.6
8:00 AM	50.1	8:00 PM	56.1
9:00 AM	48.5	9:00 PM	49.7
10:00 AM	50.5	10:00 PM	50.8
11:00 AM	50.6	11:00 PM	50.3
24-Hour CNEL			**59.2**

[1] LT-2 was taken east of Porsche Way, approximately 60 feet north of La Quinta Inn property line. LT-2 was recorded on 04/07/2021.

Table 12
24 Noise Measurement Results, LT-3[1]

Time	Leq (dBA)	Time	Leq (dBA)
12:00 AM	52.5	12:00 PM	56.2
1:00 AM	45.8	1:00 PM	56.8
2:00 AM	49.0	2:00 PM	55.1
3:00 AM	49.8	3:00 PM	58.1
4:00 AM	51.7	4:00 PM	57.3
5:00 AM	52.3	5:00 PM	59.2
6:00 AM	54.8	6:00 PM	57.1
7:00 AM	55.8	7:00 PM	57.2
8:00 AM	55.0	8:00 PM	56.7
9:00 AM	57.6	9:00 PM	53.1
10:00 AM	58.1	10:00 PM	53.0
11:00 AM	55.7	11:00 PM	57.5
24-Hour CNEL			**60.6**

[1] LT-3 was taken northwest corner of Concours Street and Ferrari Street, approximately 110 feet to the west from the centerline of Concours Street. LT-2 was recorded on 04/07/2021.

Table 13
24 Noise Measurement Results, LT-4[1]

Time	Leq (dBA)	Time	Leq (dBA)
12:00 AM	39.2	12:00 PM	44.5
1:00 AM	38.8	1:00 PM	43.8
2:00 AM	40.0	2:00 PM	43.8
3:00 AM	39.1	3:00 PM	46.7
4:00 AM	38.6	4:00 PM	44.8
5:00 AM	40.5	5:00 PM	43.3
6:00 AM	44.0	6:00 PM	42.2
7:00 AM	44.8	7:00 PM	40.8
8:00 AM	48.4	8:00 PM	39.8
9:00 AM	59.3	9:00 PM	39.9
10:00 AM	50.7	10:00 PM	39.3
11:00 AM	44.9	11:00 PM	40.5
24-Hour CNEL			**49.9**

[1] LT-4 was taken in the parking lot, approximately 450 feet to the north from the centerline of Concours Street. LT-4 was recorded on 04/07/2021.

6.0 Operational Noise Impacts

This assessment analyzes the anticipated noise levels generated by the project. The main sources of noise generated by the project would include vehicular traffic noise along the adjacent roadways. Noise level impacts are compared to the City of Ontario noise standards.

The project must demonstrate that noise levels generated by the project site would not result in a permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

6.1 Stationary Source Noise Impacts

The project is not expected to consist of significant sources of stationary noise. The main sources of potential stationary noise impacts from the project would mainly include on-site circulation and parking lot noise, HVAC units and outdoor conversational noise.

The types of on-site noise from the project are typically considered compatible with other adjacent commercial/mixed use and would not typically be categorized as loud, unnecessary, or unusual noise that disturbs the peace or quiet of any neighborhood, or that causes discomfort or annoyance to any person of normal sensitiveness. In particular, social activities and vehicular related noise are generally substantially less during the noise sensitive nighttime hours. Although, mechanical HVAC equipment does have the potential to operate 24-hours a day.

Rooftop mechanical HVAC equipment are expected to be located at the center of each building. The nearest noise sensitive residential receptors are located approximately 750 feet away to the west of the proposed Lot C HVAC units and the noise impacts from the operation of mechanical HVAC equipment is expected to be not significant at this distance. Therefore, a preliminary evaluation of noise impacts at the adjacent commercial uses has been provided.

Parking lot noise would occur from vehicle engine idling and exhaust, doors slamming, tires screeching, people talking, and the occasional horn honking. Parking lot noise is expected to occur on Lot F and Lot G and is conservatively assessed from the first parking space to northern residential properties; approximately 160 feet away.

The proposed site plan shows commercial/retail uses will face Via Piemonte and would be mostly shielded from the line of sight from the adjacent receptor property lines. Therefore, the outdoor conversational noise from the commercial/retail uses would not substantially contribute noise impacts to adjacent properties and was not included as a part of this analysis.

Table 14
Stationary Noise Impact Analysis[1]

Receptor			Stationary Noise Source				Combined Exterior Noise Level (Leq) dBA	
Number[2]	Land Use	Location	Source	Location	Distance[3]	Noise Level (Leq) dBA	Daytime[4]	Nighttime[4]
1	Residential	North of Lot F & Lot G	Parking Lot	Lot F & Lot G	160	34.8	34.8	34.8
2	Residential	West of Lot C	HVAC	Lot C	510	32.2	32.6	32.6
			Parking Lot	Lot F	735	21.9		
City of Ontario Residential Exterior Standard Levels							**65.0**	**50.0**
Noise Level Exceeds Standard (?)							**No**	**No**
3	Commercial	South of Lot C and Lot D	HVAC	Lot A	213	39.6	43.7	43.7
			HVAC	Lot C	243	38.5		
			HVAC	Lot D	243	38.5		
			Parking Lot	Lot F & Lot G	530	24.7		
4	Commercial	East of Lot D	HVAC	Lot D	485	32.7	36.6	36.6
			Parking Lot	Lot G	170	34.3		
5	Commercial	East of Lot A	HVAC	Lot A	213	39.6	42.4	42.4
			HVAC	Lot B	525	39.1		
6	Commercial	South of Lot B	HVAC	Lot A	580	31.1	39.0	39.0
			HVAC	Lot B	250	38.2		
City of Ontario Commercial Exterior Standard Levels							**65.0**	**60.0**
Noise Level Exceeds Standard (?)							**No**	**No**

[1] Stationary noise calculation worksheets are shown in Appendix C.
[2] Refer Exhibit A for Receptor Location.
[3] Distance from the receptor to the nearest noise source.
[4] Daytime: (7:00 A.M. to 10:00 P.M.); Nighttime: (10:00 P.M. to 7:00 A.M.)

As shown in Table 14, operational noise levels generated by the project are not expected to exceed the City's daytime standards and nighttime noise standards at the nearest receptor property line for both commercial and residential uses. Stationary noise calculation worksheets are shown in Appendix C.

6.2 Preliminary Interior Noise Analysis

Traffic noise along the adjacent roadways is expected to be the primary source of ambient noise impacting future residents at the project site. Traffic noise is analyzed to determine the project's noise/land use compatibility setting and to determine future noise levels to habitable exterior and interior areas on the project site. This section of the analysis does not necessarily apply to CEQA, as recent court rulings have indicated that CEQA is primarily concerned with the project's impact of the environment, not the environment's impact on a project.

Future traffic noise along the roadways is obtained from The Ontario Plan Figure S-3a, Future Roadway Noise Contours and represents the noise levels at the project site.

Table 15 shows the estimated future traffic noise levels at the project site and the noise/land use compatibly rating based on the City of Ontario General Plan Table LU-7 standards. The Ontario Plan Noise Level Exposure and Land Use Compatibility Guidelines is provided in Appendix A.

Table 15
Future Traffic Noise Levels[1]

Receptor	Exterior Noise Level (Ldn) (dBA CNEL)	Noise/Land Use Compatibility
Multifamily Residential	65-70	Normally Unacceptable
Retail	65-70	Normally Acceptable

[1] Source: The City of Ontario General Plan Table LU-7

The project may experience noise levels that fall within the normally unacceptable range (65-75 CNEL) for the residential part of the project and clearly acceptable (65-70 CNEL) for the retail part of the project. Hence, upgraded building construction techniques are expected to be required to achieve interior noise level standards for the residential uses.

Based on Section 5, the existing noise levels (CNEL) nearest the project site range from 60.6 CNEL to 62.5 CNEL. It should be noted that the existing noise levels were taken during typical weekday conditions and do not include noise levels during an event at the Toyota Arena event center, which may further increase noise levels (i.e., traffic) in the area. Therefore, in order to be conservative, the higher limit of the future traffic noise levels at the project site (70 dBA CNEL) has been utilized to conduct preliminary interior noise analysis.

A preliminary interior noise analysis has been prepared for the sensitive receptor locations using a typical "windows open" and "windows closed" condition. A "windows open" condition assumes 12 dBA of noise attenuation from the exterior noise level. A "windows closed" condition" assumes 20 dBA of noise attenuation from the exterior noise level.

Table 16 indicates the interior noise levels for the residential uses on the project site.

Table 16
Preliminary Interior Noise Impact Analysis

Receptor Location	Exterior Noise Level at Building Facade (CNEL)	Interior Noise Standard (CNEL)	Required Building Shell Noise Reduction (CNEL)	Interior Noise Level with Standard California Construction Windows (STC ≥ 25)		STC Rating for Windows Facing Subject Roadway
				"Windows Open" [1]	"Windows Closed" [2]	
Multifamily Residential	70	45.0	25	58	50	28

[1] A minimum of 12 dBA noise reduction is assumed with the "windows open" condition.
[2] A minimum of 20 dBA noise reduction is assumed with the "windows closed" condition.

The project is expected to require a "windows closed" condition and upgraded STC rated windows to meet the City/State interior noise standard of 45 dBA. To accommodate a windows closed conditions, all units shall be equipped with adequate fresh air ventilation, per the requirements of the California Uniform Building Code (UBC).

Prior to issuance of building permits, the project proponent should demonstrate to the City building department that the proposed building shell and window assemblies will achieve exterior to interior noise reduction necessary to meet the State of California and City of Ontario requirements.

Furthermore, the project shall comply with California Title 24 insulation building requirements for multi-family dwelling units for common separating assemblies (e.g. floor/ceiling assemblies and demising walls).

6.3 Los Angeles Ontario International Airport (LAONT)

The Los Angeles Ontario International Airport (LAONT) is centrally located in the City of Ontario. The airport is a medium-hub, full-service airport. Traffic at the airport includes general aviation, commercial passenger aviation, and air cargo freight movement. LAONT is a member of the Los Angeles World Airport (LAWA) system. LAWA is currently developing a Master Land Use Plan for LAONT that will provide a framework for the airport's development and use through the year 2030.

The LAONT is located approximately one and a quarter (1.25) miles to the northeast of the project site. A noise/land use compatibility assessment has been performed based on the project's location to the LAONT Airport. The noise contour maps for the LAONT Airport are provided in Exhibit D.

The project is located outside of the 60 dB Ldn noise contour limit; therefore, the exterior noise impact from the airport would be within the allowable limits for residential land uses and the project is considered compatible with the surrounding land use and noise environment. Noise from airport operations is expected to generate a less than significant on the proposed project.

6.4 Recommended Operational Design Features

The following recommended project design features include standard rules and requirements, best practices and recognized design guidelines for reducing noise levels. Design features are assumed to be part of the conditions of the project and integrated into its design. Design features are not typically considered mitigation under CEQA.

DF-1 Prior to the issuance of building permits, the project shall prepare a final acoustical study that demonstrates building construction will achieve the minimum interior noise standard of 45 dBA CNEL for all residential units located along arterial roadways and/or adjacent to industrial uses, per the California Building Standards Code. The following noise control measures may be required for dwelling units located near adjacent roadways and industrial uses:

- Install sound barriers between residences and noise sources.
- Install double-paned or similar sound rated windows.
- Provide sound insulating exterior walls and roofing systems.

- Locate and/or design attic vents to minimize sound propagation into each home.

- Provide forced-air ventilation systems.

- Place dwellings as far as practical from the noise source

DF-2 The project shall comply with California Title 24 building insulation requirements for exterior walls, roofs and common separating assemblies (e.g. floor/ceiling assemblies and demising walls).

DF-3 For proper acoustical performance, all exterior windows, doors, and sliding glass doors should have a positive seal and leaks/cracks must be kept to a minimum.

DF-4 The final building plans shall ensure that HVAC units are not located within an area of the project site that would contribute to a noise level exceedance at any adjacent property line, per the City of Ontario Municipal Code requirements. To meet the City's noise standards the following measures should be followed:

- All HVAC equipment shall be shielded or enclosed from the line of sight of adjacent residential uses.

7.0 Construction Noise and Vibration Impacts

Temporary construction noise and vibration impacts have been assessed from the project site to the nearest sensitive residential use to the north of Lot F and Lot G. The degree of construction noise will vary depending on the type of construction activity taking place and the location of the activity relative to the surrounding properties.

Chapter 29: Noise, Section 5-29.06 of the City's municipal code states that the following activities shall be exempted from the provisions of the noise code;

- Noise sources associated with construction, repair, remodeling, demolition or grading of any real property. Such activities shall instead be subject to the following provisions of § 5-29.09;

    i. No person, while engaged in construction, remodeling, digging, grading, demolition or any other related building activity, shall operate any tool, equipment or machine in a manner that produces loud noise that disturbs a person of normal sensitivity who works or resides in the vicinity, or a Police or Code Enforcement Officer, on any weekday except between the hours of 7:00 a.m. and 6:00 p.m. or on Saturday or Sunday between the hours of 9:00 a.m. and 6:00 p.m.

    ii. No landowner, construction company owner, contractor, subcontractor, or employer shall permit or allow any person or persons working under their direction and control to operate any tool, equipment or machine in violation of the provisions of this section.

To help further assess potential construction noise level impacts under CEQA, the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment (2006) criteria is used as a referenced threshold of significance in this report. The FTA provides reasonable criteria for assessing construction noise impacts based on the potential for adverse community reaction. For residential uses, the daytime noise threshold is 80 dBA Leq for an 8-hour period. In compliance with the City's Municipal Code, it is assumed construction would not occur during the noise-sensitive nighttime hours.

7.1 Typical Construction Noise Levels

Table 17 shows typical construction noise levels compiled by the Environmental Protection Agency (EPA) for common type construction equipment. Typical construction noise levels

are used to estimate potential project construction noise levels at the adjacent sensitive receptors.

Table 17
Typical Construction Noise Levels[1]

Type	Noise Levels (dBA) at 50 Feet
Earth Moving	
Compactors (Rollers)	73 - 76
Front Loaders	73 - 84
Backhoes	73 - 92
Tractors	75 - 95
Scrapers, Graders	78 - 92
Pavers	85 - 87
Trucks	81 - 94
Materials Handling	
Concrete Mixers	72 - 87
Concrete Pumps	81 - 83
Cranes (Movable)	72 - 86
Cranes (Derrick)	85 - 87
Stationary	
Pumps	68 - 71
Generators	71 - 83
Compressors	75 - 86
Impact Equipment	
Pneumatic Wrenches	82 - 87
Jack Hammers, Rock Drills	80 - 99
Pile Drivers (Peak)	95-105
Other	
Vibrators	68 - 82
Saws	71 - 82

[1] Referenced Noise Levels from the Environmental Protection Agency (EPA)

7.2 Construction Noise Impact Analysis

This assessment analyzes potential noise impacts during all expected phases of construction, including; demolition, site preparation, grading, building construction, paving, and architectural coating. Construction phasing and equipment usage assumptions are referenced from:

- Toyota Arena Mixed Use Development AQ & GHG Impact Study, by RK Engineering Group, June 2021.

The project's estimated construction noise levels have been calculated using the Federal Highway Administration Roadway Construction Noise Model Version 1.1. Tables 18 show the noise level impacts to the nearest residential property lines to the north at 160 feet. Construction noise calculation worksheets are provided in Appendix D.

Table 18
Project Construction Noise Levels – Residential Uses to the North

Phase	Equipment	Quantity	Equipment Noise Level at 160ft (dBA Leq)	Combined Noise Level (dBA Leq)
Demolition	Concrete/Industrial Saw	1	72.5	76.3
	Excavator	3	66.6	
	Rubber Tired Dozer	2	67.6	
Site Preparation	Rubber Tired Dozers	3	67.6	77.5
	Tractors/Loaders/Backhoes	4	69.9	
Grading	Excavators	2	66.6	78.1
	Graders	1	70.9	
	Rubber Tired Dozers	1	67.6	
	Scrappers	2	69.5	
	Tractors/Loaders/Backhoes	2	69.9	
Building Construction	Cranes	1	62.5	76.2
	Forklifts	3	60.9	
	Generator Sets	1	67.5	
	Tractors/Loaders/Backhoes	3	69.9	
	Welders	1	59.9	
Paving	Cement and Mortar Mixer	2	64.7	71.8
	Pavers	2	64.1	
	Paving Equipment	2	62.9	
Architectural Coating	Air Compressors	1	63.6	63.6
Worst Case Construction Phase Noise Level - Leq (dBA)				78.1
FTA Construction Noise Criteria (Detailed Assessment: 8-Hour Leq)				80.0
Noise level exceeds FTA criteria?				No

As shown in Table 18, project construction noise levels are expected to be below the recommended 8-hour construction noise threshold provided by the FTA for adverse community reaction at the adjacent residential uses.

7.3 Construction Vibration

To determine the vibratory impacts during construction, reference construction equipment vibration levels were utilized and then extrapolated to the façade of the nearest adjacent structures. The nearest sensitive receptors are the commercial/retail structures located adjacent to the project site. All structures surrounding the project site are "new structures". No historical or fragile buildings are known to be located within the vicinity of the site.

The construction of the proposed project is not expected to require the use of substantial vibration inducing equipment or activities, such as pile drivers or blasting. The main sources of vibration impacts during construction of the project would be the operation of equipment such as bulldozer activity during demolition, loading trucks during grading and excavation, and vibratory rollers during paving.

The construction vibration assessment utilizes the referenced vibration levels and methodology set-forth within the Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, September 2018.

Table 19 shows the referenced vibration levels.

Table 19
Typical Construction Vibration Levels[1]

Equipment	Peak Particle Velocity (PPV) (inches/second) at 25 feet	Approximate Vibration Level (LV) at 25 feet
Piledriver (impact)	1.518 (upper range)	112
	0.644 (typical)	104
Piledriver (sonic)	0.734 upper range	105
	0.170 typical	93
Clam shovel drop (slurry wall)	0.202	94
Hydromill	0.008 in soil	66
(slurry wall)	0.017 in rock	75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

[1] Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, September 2018

Table 20 shows the project's construction-related vibration analysis at the nearest structures to the project construction area. Construction impacts are assessed from the closest area on the project site to the nearest adjacent structure at approximately 50 feet. The worst case vibratory impact from the site is estimated to be 0.098 PPV (in/sec) at the structures to the west. No damage potential is expected.

Table 20
Construction Vibration Impact Analysis

Construction Activity	Distance to Nearest Structure (ft)	Duration	Calculated Vibration Level - PPV (in/sec)	Damage Potential Level	Annoyance Criteria Level
Large Bulldozer	50	Continuous/Frequent	0.042	No Impacts	Distinctly Perceptible
Vibratory Roller	50	Continuous/Frequent	0.035	No Impacts	Barely Perceptible
Loaded Trucks	50	Continuous/Frequent	0.098	Extremely Fragile Buildings, Ruins Ancient Monuments	Distinctly Perceptible
Caisson Drilling	50	Continuous/Frequent	0.042	No Impacts	Distinctly Perceptible

As shown in Table 20, project related construction activity is not expected to cause any potential damage to the nearest structures. The annoyance potential of vibration from construction activities would range from "distinctly perceptible" to "Barely perceptible".

Construction vibration calculation worksheets are shown in Appendix D.

7.4 Recommended Construction Design Features

The following recommended project design features include standard rules and requirements, best practices and recognized design guidelines for reducing noise levels. Design features are assumed to be part of the conditions of the project and integrated into its design. Design features are not typically considered mitigation under CEQA

DF-7 Prepare a construction management plan and obtain a construction work permit from the City of Ontario prior to starting construction. The construction management plan shall ensure all contractors implement construction best management practices to reduce construction noise levels. Best management practices shall include the following:

- All construction equipment shall be equipped with muffles and other suitable noise attenuation devices (e.g., engine shields).
- Grading and construction contractors shall use quieter equipment as opposed to noisier equipment (such as rubber-tired equipment rather than track equipment), to the maximum extent feasible.
- If feasible, electric hook-ups shall be provided to avoid the use of generators. If electric service is determined to be infeasible for the site, only whisper-quiet generators shall be used (i.e., inverter generators capable of providing variable load.
- Use electric air compressors and similar power tools rather than diesel equipment, where feasible.
- Locate staging area, generators and stationary construction equipment as far from the adjacent residential homes as feasible.
- Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 5 minutes.

- Provide notifications and signage in readily visible locations along the perimeter of construction sites that indicate the dates and duration of construction activities, as well as provide a telephone number where neighbors can enquire about the construction process and register complaints to a designated construction noise disturbance coordinator.

- Construction activities shall not take place between the hours of 6:00 p.m. and 7:00 a.m. on weekdays and Saturday or Sunday between the hours of 9:00 a.m. and 6:00 p.m.

DF-8 No impact pile driving or blasting activities shall be permitted on the project site during construction. If impact pile driving or blasting is required, a follow-up noise and vibration impact assessment shall be conducted prior to start of any activity.

Exhibits

Exhibit A

Location Map

N

Legend:

① = Receptor Location

Exhibit C

Noise Monitoring Locations

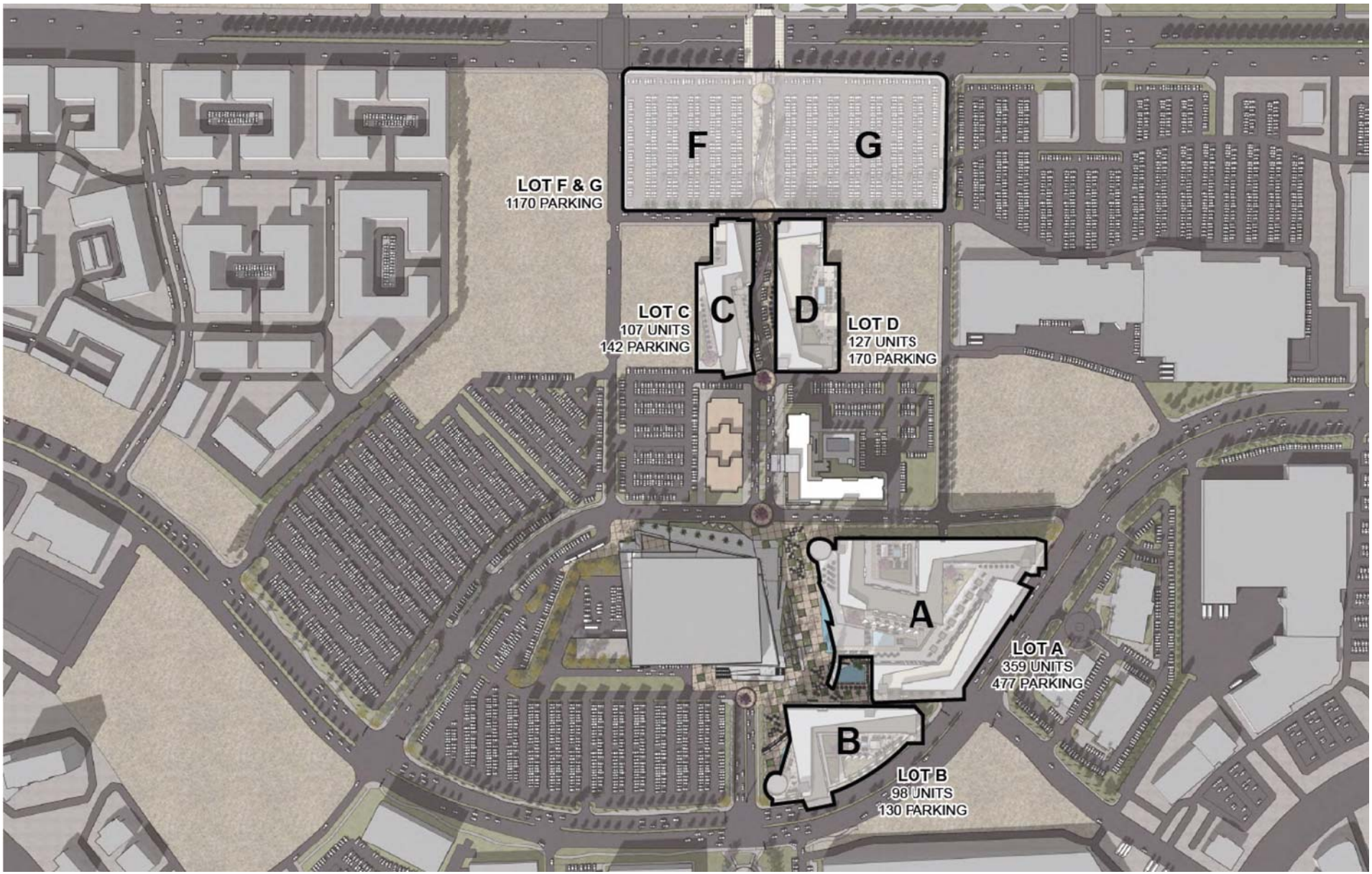


Exhibit C

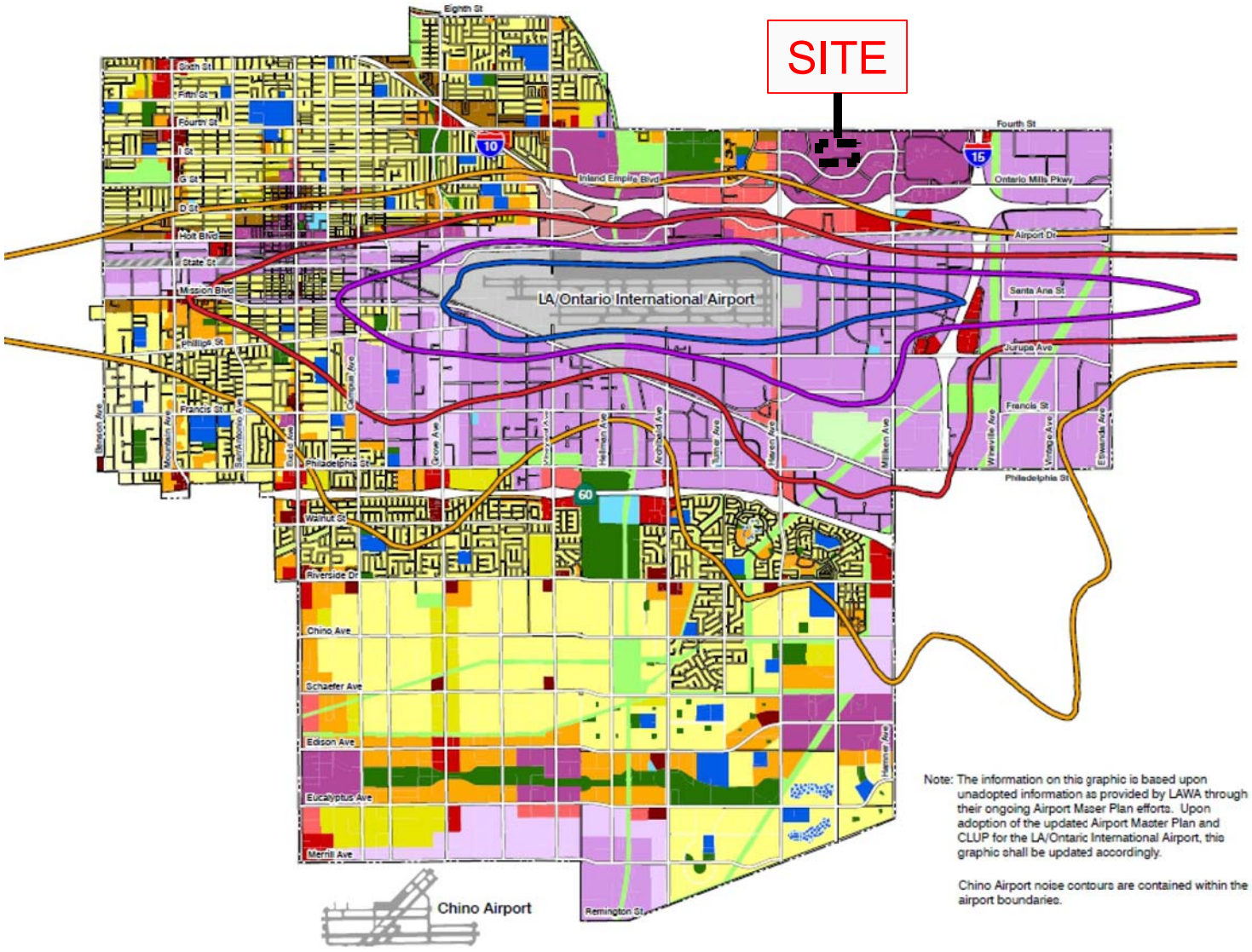
Noise Monitoring Locations

Legend:

LT-1 = Long Term (24-Hr) Noise Monitoring Location

Exhibit D

LAONT Airport Noise Contours



Airport Noise Contours

LA/Ontario International Airport (2030)

- 60 dB CNEL
- 65 dB CNEL
- 70 dB CNEL
- 75 dB CNEL

Residential
- Rural (0 - 2 du/ac)
- Low Density (2.1 - 5 du/ac)
- Low-Medium Density (5.1 - 11 du/ac)
- Medium Density (11.1 - 25 du/ac)
- High Density (25.1 - 45 du/ac)

Mixed Use
- Mixed Use

Retail/Service
- Neighborhood Commercial (.4 FAR)
- General Commercial (.4 FAR)
- Office/Commercial (1.0 FAR)
- Hospitality (1.0 FAR)

Employment
- Business Park (.6 FAR)
- Industrial (.55 FAR)

Other
- Open Space - Non-Recreation
- Open Space - Parkland
- Open Space - Water
- Public Facility
- Public School
- LA/Ontario International Airport
- Railroad
- Landfill

Note: The information on this graphic is based upon unadopted information as provided by LAWA through their ongoing Airport Maser Plan efforts. Upon adoption of the updated Airport Master Plan and CLUP for the LA/Ontaric International Airport, this graphic shall be updated accordingly.

Chino Airport noise contours are contained within the airport boundaries.

0 Miles 1

Appendices

Appendix A

City of Ontario
Noise Standards

CHAPTER 29: NOISE

5-29.01 Declaration of findings and policy

5-29.02 Definitions

5-29.03 Designated noise zones

5-29.04 Exterior noise standards

5-29.05 Interior noise standards

5-29.06 Exemptions

5-29.07 Loud and disturbing noise

5-29.08 Real property maintenance noise regulations

5-29.09 Construction activity noise regulations

5-29.10 Other public agency exceptions

5-29.11 Schools, day care centers, churches, libraries, museums, health care institutions; Special provisions

5-29.12 Sound amplifying equipment

5-29.13 Amplified sound

5-29.14 Motor vehicles

5-29.15 Noise level measurement

5-29.16 Prima facie violation

5-29.17 Penalty

5-29.18 Enforcement and administration

5-29.19 City Manager waiver

5-29.20 Noise abatement program

Sec. 5-29.01. Declaration of findings and policy.

It is hereby found and declared that:

(a) The making and creation of excessive, unnecessary or unusually loud noises within the limits of the City is a condition that has existed for some time, however, the extent and volume of such noises is increasing;

(b) The making, creation or maintenance of such excessive, unnecessary, unnatural or unusually loud noises that are prolonged, unusual and unnatural in their time, place and use affect and are a detriment to public health, comfort, convenience, safety, welfare and prosperity of the residents of the City; and

(c) The necessity in the public interest for the provisions and prohibitions hereinafter contained and enacted, is declared as a matter of legislative determination and public policy, and it is further declared

that the provisions and prohibitions hereinafter contained and enacted are in pursuance of and for the purpose of securing and promoting the public health, comfort, convenience, safety, welfare and prosperity and the peace and quiet of the residents of the City.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.02. Definitions.

As used in this chapter, specific words and phrases are defined as follows:

(a) "Ambient noise level" shall mean the all-encompassing noise level associated with a given environment and is a composite of sounds from all sources, excluding the alleged offensive noise or excessive sound, at the location and approximate time at which a comparison with the alleged offensive noise is to be made.

(b) "Applicable (noise) zone" shall mean the noise zone category based on the actual use of the property, provided that the actual use is a legal use in the City.

(c) "A-weighted sound level" shall mean the sound pressure level in decibels (dBAs) as measured with a sound level meter using the A-weighted filter network (scale) at slow response and at a pressure of twenty (20) micropascals. The A-weighted filter de-emphasizes the very low and a very high frequency component of sound in a manner similar to the response of the human ear, and is a numerical method of rating human judgment of loudness.

(d) "Decibel (dBA)" shall mean a unit for measuring the amplitude of a sound, equal to twenty (20) times the logarithm to the base ten (10) of the ratio of pressure of the sound measured to the reference pressure of twenty (20) micropascals.

(e) "Equivalent sound or noise level (Leq)" shall mean the International Electrotechnical Commission (IEC) 60804 Standard for measurement, or the most recent revision thereof, for the sound level corresponding to a steady state noise level over a given sample period with the same amount of acoustic energy as the actual time varying noise level or the energy average noise level during the sample period. The measurement period for the purposes of this chapter is fifteen (15) minutes.

(f) "Impulsive noise" shall mean a noise of short duration usually less than one (1) second and of high intensity, with an abrupt onset and rapid decay. Such objectionable noises may also be repetitive.

(g) "Intrusive noise" shall mean that noise that intrudes over and above the ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence and tonal information content, as well as the prevailing ambient noise level.

(h) "Maintenance" shall mean the upkeep, repair or preservation of existing property or structures.

(i) "Noise" shall mean any unwanted sound or sound that is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing or is otherwise annoying.

(j) "Noise level (sound level)" shall mean the weighted sound pressure level obtained by use of a sound level meter having a standard frequency filter for attenuating part of the sound spectrum. For purposes of this chapter, all noise levels (sound levels) shall be A-weighted sound pressure level.

(k) "Noise (sound) level meter" shall mean an instrument, including a microphone, an amplifier, an output meter and frequency weighting networks for the measurement and determination of noise and sound levels. For the purposes of this chapter, the sound level meter must meet the International Electrotechnical Commission (IEC) 60651 and 60804 Standards, or the most recent revisions thereof, for Type 1 sound level meters or an instrument and the associated recording and analyzing equipment that will provide equivalent data.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.03. Designated noise zones.

The properties hereinafter described shall be assigned to the following noise zones:

Noise Zone I:	All single-family residential properties;
Noise Zone II:	All multi-family residential properties and mobile home parks;
Noise Zone III:	All commercial property;
Noise Zone IV:	The residential portion of mixed use properties;
Noise Zone V:	All manufacturing or industrial properties and all other uses.

The actual use of the property, and not necessarily its zoning designation, shall be the determining factor in establishing whether a property is in Noise Zone I, II, III, IV or V, provided that the actual use is a legal use within the applicable zone.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.04. Exterior noise standards.

(a) The following exterior noise standards, unless otherwise specifically indicated, shall apply to all properties within a designated noise zone.

Allowable Exterior Noise Level (1)		***Allowed Equivalent Noise Level, Leq. (2)***	
Noise Zone	***Type of Land Use***	***7 a.m. to 10 p.m.***	***10 p.m. to 7 a.m.***
I	Single-Family Residential	65 dBA	45 dBA
II	Multi-Family Residential, Mobile Home Parks	65 dBA	50 dBA
III	Commercial Property	65 dBA	60 dBA
IV	Residential Portion of Mixed Use	70 dBA	70 dBA
V	Manufacturing and Industrial, Other Uses	70 dBA	70 dBA

(1) If the ambient noise level exceeds the resulting standard, the ambient noise level shall be the standard.

(2) Measurements for compliance are made on the affected property pursuant to § 5-29.15.

(b) It is unlawful for any person at any location within the incorporated area of the City to create noise, or to allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which noise causes the noise level, when measured at any location on any other property, to exceed either of the following:

(1) The noise standard for the applicable zone for any fifteen-minute (15) period; and

(2) A maximum instantaneous (single instance) noise level equal to the value of the noise standard plus twenty (20) dBA for any period of time (measured using A-weighted slow response).

(c) In the event the ambient noise level exceeds the noise standard, the maximum allowable noise level under such category shall be increased to reflect the maximum ambient noise level.

(d) The Noise Zone IV standard shall apply to that portion of residential property falling within one hundred (100) feet of a commercial property or use, if the noise originates from that commercial property or use.

(e) If the measurement location is on a boundary between two (2) different noise zones, the lower noise level standard applicable to the noise zone shall apply.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.05. Interior noise standards.

(a) The following interior noise standards, unless otherwise specifically indicated, shall apply to all properties within a designated noise zone.

Allowable Interior Noise Level (1)		**Allowed Equivalent Noise Level, Leq.** (2)	
Noise Zone	***Type of Land Use***	***7 a.m. to 10 p.m.***	***10 p.m. to 7 a.m.***
I	Single-Family Residential	45 dBA	40 dBA
II	Multi-Family Residential, Mobile Home Parks	45 dBA	40 dBA
IV	Residential Portion of Mixed Use	45 dBA	40 dBA

(1) If the ambient noise level exceeds the resulting standard, the ambient noise level shall be the standard.

(2) Measurements for compliance are made on the affected property pursuant to § 5-29.15.

(b) It is unlawful for any person at any location within the incorporated area of the City to create noise, or to allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which noise causes the noise level, when measured at any location on any other property, to exceed either of the following:

(1) The noise standard for the applicable zone for any fifteen-minute (15) period;

(2) A maximum instantaneous (single instance) noise level equal to the value of the noise standard plus twenty (20) dBA for any period of time (measured using A-weighted slow response).

(c) In the event the ambient noise level exceeds the noise standard, the maximum allowable noise level under such category shall be increased to reflect the maximum ambient noise level.

(d) The Noise Zone IV standard shall apply to that portion of residential property falling within one hundred (100) feet of a commercial property or use, if the noise originates from that commercial property or use.

(e) If the measurement location is on a boundary between two (2) different noise zones, the lower noise level standard applicable to the noise zone shall apply.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.06. Exemptions.

The following activities shall be exempted from the provisions of this chapter:

(a) Any activity conducted on public property, or on private property with the consent of the owner, by any public entity or its officers, employees, representatives, agents, subcontractors, permittees, licensees or lessees that the public entity has authorized are exempt from the provisions of this chapter. This includes, without limitation, sporting and recreational activities that are sponsored, co-sponsored, permitted or allowed by the City or any school district within the City's jurisdictional boundaries. This also includes, without limitation, occasional outdoor gatherings, public dances, shows or sporting and entertainment events, provided such events are conducted pursuant to an approval, authorization, contract, lease, permit or sublease by the appropriate public entity, specifically the planning commission or City Council;

(b) Occasional outdoor gatherings, public dances, show, sporting and entertainment events, provided said events are conducted pursuant to a permit or license issued by the appropriate jurisdiction relative to the staging of said events;

(c) Any mechanical device, apparatus or equipment used, related to or connected with emergency machinery, vehicle, work or warning alarm or bell, provided the sounding of any bell or alarm on any building or motor vehicle shall terminate its operation within forty-five (45) minutes in any hour of its being activated;

(d) Noise sources associated with construction, repair, remodeling, demolition or grading of any real property. Such activities shall instead be subject to the provisions of § 5-29.09;

(e) Noise sources associated with construction, repair, remodeling, demolition or grading of public rights-of-way or during authorized seismic surveys;

(f) All mechanical devices, apparatus or equipment associated with agriculture operations provided that:

(1) Operations do not take place between 8:00 p.m. and 7:00 a.m.;

(2) Such operations and equipment are utilized for the protection or salvage of agricultural crops during periods of potential or actual frost damage or other adverse weather conditions; or

(3) Such operations and equipment are associated with agricultural pest control through pesticide application, provided the application is made in accordance with permits issued by or regulations enforced by the California Department of Agriculture;

(g) Noise sources associated with the maintenance of real property. Such activities shall instead be subject to the provisions of § 5-29.08;

(h) Any activity to the extent regulation thereof has been preempted by state or federal law;

(i) Any noise sources associated with people and/or music associated with a party at a residential property. Such noise shall be subject to the provisions of OMC § 5-29.07;

(j) Any noise source emanating from an ice cream truck within the City. Such noise shall be subject to the provisions of OMC § 4-18.04;

(k) Any noise sources associated with barking dogs or other intermittent noises made by animals on any properly within the City. Such noise shall be subject to the provisions of OMC Chapter 1, Title 6;

(l) Noise sources related to uses approved by a permit or development agreement adopted prior to the date of adoption of this chapter and that contains acoustic or noise standard conditions of approval. This exemption shall only be applicable during the effective period of the City-approved permit or development agreement.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.07. Loud and disturbing noise.

(a) It is unlawful for any person or property owner within the City to make, cause or allow to be made any loud, excessive, impulsive or intrusive noise, disturbance or commotion that disturbs the peace or quiet of any area or that causes discomfort or annoyance to any reasonable person of normal sensitivities in the area, after a Police or Code Enforcement Officer has first requested that the person or property owner cease and desist from making such noise. The types of loud, disturbing, excessive, impulsive or intrusive noise may include, but shall not be limited to, yelling, shouting, hooting, whistling, singing, playing a musical instrument, or emitting or transmitting any loud music or noise from any mechanical or electrical sound making or sound-amplifying device.

(b) The factors, standards, and conditions that may be considered in determining whether a violation of the provisions of this section has been committed, included, but not limited to, the following:

(1) The level of the noise;

(2) The level and intensity of the background (ambient) noise, if any;

(3) The proximity of the noise to residential or commercial sleeping areas;

(4) The nature and zoning of the area within which the noise emanates;

(5) The density of inhabitation of the area within which the noise emanates;

(6) The time of day and night the noise occurs;

(7) The duration of the noise;

(8) Whether the noise is constant, recurrent or intermittent;

(9) Whether the noise is produced by a commercial or noncommercial activity; and

(10) Whether the use is lawful under the provisions of Title 5 of this Code and whether the noise is one that could reasonably be expected from the activity or allowed use.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.08. Real property maintenance noise regulations.

(a) No person, while engaged in maintenance of real property, shall operate any tool, equipment or machine in a manner that produces loud noise that disturbs a person of normal sensitivity who works or resides in the vicinity, or a Police or Code Enforcement Officer, except between the hours of 8:00 a.m. and 6:00 p.m.

(b) Trimming or pruning that requires the use of chainsaws or mulching machines shall only be allowed between the hours of 8:00 a.m. and 6:00 p.m. on a weekday and between the hours of 9:00 a.m. and 5:00 p.m. on Saturday or Sunday.

(c) The use of electrical or gasoline powered blowers, such as commonly used by gardeners or other persons for cleaning lawns, yards, driveways, gutters and other property shall only be allowed between the hours of 8:00 a.m. and 6:00 p.m. on a weekday and between the hours of 9:00 a.m. and 5:00 p.m. on Saturday or Sunday.

(d) No landowner, gardener, property maintenance service, contractor, subcontractor or employer shall permit or allow any person or persons working under his or her direction or control to operate any tool, equipment or machine in violation of the provisions of this section.

(e) Exceptions. The provisions of this section shall not apply to the following:

(1) Emergency property maintenance required by the building official;

(2) The maintenance, repair or improvement of any public work or facility by public employees, by any person or persons acting pursuant to a public works contract, or by any person or persons performing such work or pursuant to the direction of, or on behalf of, any public agency; provided, however, this exception shall not apply to the City, or its employees, contractors or agents, unless:

(i) The City Manager or department head determines that the maintenance, repair or improvement is immediately necessary to maintain public service,

(ii) The maintenance, repair or improvement is of a nature that cannot feasibly be conducted during normal business hours, or

(iii) The City Council has approved project specifications, contract provisions, or an environmental document that specifically authorizes maintenance during hours of the day that would otherwise be prohibited pursuant to this section; and

(3) Any maintenance that complies with the noise limits specified in § 5-29.04.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.09. Construction activity noise regulations.

(a) No person, while engaged in construction, remodeling, digging, grading, demolition or any other related building activity, shall operate any tool, equipment or machine in a manner that produces loud noise that disturbs a person of normal sensitivity who works or resides in the vicinity, or a Police or Code Enforcement Officer, on any weekday except between the hours of 7:00 a.m. and 6:00 p.m. or on Saturday or Sunday between the hours of 9:00 a.m. and 6:00 p.m.

(b) No landowner, construction company owner, contractor, subcontractor, or employer shall permit or allow any person or persons working under their direction and control to operate any tool, equipment or machine in violation of the provisions of this section.

(c) Exceptions.

(1) The provisions of this section shall not apply to emergency construction work performed by a private party when authorized by the City Manager or his or her designee;

(2) The maintenance, repair or improvement of any public work or facility by public employees, by any person or persons acting pursuant to a public works contract, or by any person or persons performing such work or pursuant to the direction of, or on behalf of, any public agency; provided, however, this exception shall not apply to the City, or its employees, contractors or agents, unless:

(i) The City Manager or a department head determines that the maintenance, repair or improvement is immediately necessary to maintain public services,

(ii) The maintenance, repair or improvement is of a nature that cannot feasibly be conducted during normal business hours, or

(iii) The City Council has approved project specifications, contract provisions, or an environmental document that specifically authorizes construction during hours of the day that would otherwise be prohibited pursuant to this section; and

(3) Any construction that complies with the noise limits specified in §§ 5-29.04 or 5-29.05.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.10. Other public agency exceptions.

The provisions of this chapter shall not be construed to prohibit any work at different hours by or under the direction of any other public agency or public or private utility companies in cases of necessity or emergency.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.11. Schools, day care centers, churches, libraries, museums, health care institutions; Special provisions.

It is unlawful for any person to create any noise that causes the outdoor noise level at any school, day care center, hospital or similar health care institution, church, library or museum while the same is in use, to exceed the noise standards specified in § 5-29.04 prescribed for the assigned Noise Zone I.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.12. Sound amplifying equipment.

Loudspeakers, sound amplifiers, public address systems or similar devices used to amplify sounds shall be subject to the provisions of § 5-29.13. Such sound amplifying equipment shall not be construed to include electronic devices, including but not limited to, radios, tape players, tape recorders, compact disc players, MP3 players, electric keyboards, music synthesizers, record players or televisions, which are designed and operated for personal use, or used entirely within a building and are not designed or used to convey the human voice, music or any other sound to an audience outside such building, or which are used in vehicles and heard only by occupants of the vehicle in which installed.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.13. Amplified sound.

(a) The City Council enacts the following legislation for the sole purpose of securing and promoting the public health, comfort, safety and welfare for its citizenry. While recognizing that the use of sound amplifying equipment may be entitled to certain protection by the constitutional rights of freedom of speech and assembly, the City Council finds that in order to protect the public safety and the correlative rights of the citizens of this community to privacy and freedom from public nuisance of loud and unnecessary noise, reasonable regulation of the time, place and manner of the use of amplifying equipment is necessary. In no event shall approval or authorization required herein be withheld by reason of the constitutionally protected content of any material proposed to be broadcast through amplifying equipment.

(b) It is unlawful for any person, other than personnel of law enforcement or governmental agencies, to install, use or operate a loudspeaker or sound amplifying device in a fixed or movable position or mounted upon any vehicle within the City for the purpose of giving instructions, directions, talks, addresses or lectures to any persons or assemblages of persons in or upon any street, alley, sidewalk, park, place or public property without a permit to do so from the Police Chief or his or her designee. Notwithstanding any other provision of this chapter, the provisions of this section shall also apply to the use of sound amplifying equipment upon public or private property when used in connection with outdoor or indoor public or private events, whether or not admission is charged or food or beverages are sold, when such activity is to be attended by more than one hundred (100) persons and the noise emanating from the event will be audible at the property plane, or in the case of a street dance or concert on the nearest residential property. Those activities listed in § 5-29.06(a) are exempt from the requirements of this section.

(c) The Police Chief or his or her designee is authorized to approve and issue permits under this section.

(d) An application for a permit required by this section shall be filed with the Police Chief at least sixteen (16) days and no more than one hundred twenty (120) days prior to the date on which the sound amplifying equipment is intended to be used. Applications for events covered by the First Amendment of the United States Constitution are exempt from the time requirements of this section if it is shown that circumstances require a shorter filing period and the event will not constitute an unsafe condition. The application shall contain the following information:

(1) The name, address and telephone number of both the owner and the user of the sound amplifying equipment;

(2) The license number, if a sound truck is to be used;

(3) A general description of the sound amplifying equipment which is to be used;

(4) Whether sound amplifying equipment will be used for commercial or noncommercial purpose;

(5) The dates and times upon and within which, and the streets or property over or upon which, the equipment is proposed to be operated;

(6) The name or names of one (1) or more persons who will be present during the conduct of any activities for which registration is sought and who will have authority to reduce the volume of any sound amplifying equipment during the course of the activities if required pursuant to this chapter and, otherwise, to insure compliance with the provisions of this chapter;

(7) A statement by the applicant that he or she is willing and able to comply with the provisions of this chapter and the conditions of the permit; and

(8) A sketch of the area or facilities within which the activities are to be conducted, with approximate dimensions and illustration of the location and orientation of all sound-amplifying equipment.

(e) The Police Chief shall deny the permit application or revoke any permit if the chief finds any of the following:

(1) The application contains materially false or intentionally misleading information;

(2) The use of sound amplifying equipment at an event or activity proposed will be located in or upon a premises, building or structure that is hazardous to the health or safety of the employees or patrons of the premises, business, activity, or event, or the general public, under the standards established by the Uniform Building or Fire Codes, or other applicable codes, as set forth in OMC Titles 4 and 8;

(3) The use of sound amplifying equipment at an event or activity proposed in or upon a premises, building or structure that lacks adequate on-site parking for participants attending the proposed event or activity under the applicable standards set forth in OMC Title 9;

(4) The conditions of any motor vehicle movement are such that, in his or her opinion, the use of the equipment would constitute an unreasonable interference with traffic safety;

(5) The conditions of pedestrian movement are such that the use of the equipment would constitute a detriment to traffic safety;

(6) The application submitted by the applicant reveals that the applicant would violate the provisions of this section or any other provision of federal, state and/or local law;

(7) The applicant is unwilling or unable to comply with the provisions of this chapter or any conditions imposed upon any permit issued;

(8) There had already been a permitted event at the intended location, or within a two hundred (200) yard radius of the intended location and the prior permitted event was located on residentially zoned property or on a street, alley, public parking lot or neighborhood park within three (3) months prior to the intended event. Community parks are exempt from this subsection (8); or

(9) The applicant or location has had previous violations within the past calendar year, and in the judgment of the Police Chief, issuance would be contrary to the intent of this section.

(f) In determining whether the use of the equipment would constitute an unreasonable interference with or detriment to traffic safety, the Police Chief shall consider, but shall not necessarily be limited to:

(1) The volumes, patterns and speed of vehicular and pedestrian traffic in the proposed area of use;

(2) The relationship of the proposed use of equipment and potential impacts upon traffic patterns;

(3) Availability of sufficient room for the operation of the equipment without significantly interfering with the traffic patterns;

(4) Proximity to schools, playgrounds and similar facilities where use of such equipment might attract children into traffic patterns; or

(5) Proximity to busy intersections or other potentially hazardous conditions where use of such equipment might constitute a hazard by reason of its tendency to distract drivers of vehicles or pedestrians.

(g) Issuance or denial.

(1) If the application is approved, the Police Chief shall return an approved copy of the application to the applicant and shall issue a permit. The permit shall constitute permission for the use of the sound amplifying equipment as requested.

(2) Any application filed shall be either approved or disapproved within five (5) days of the filing thereof.

(3) If the application is disapproved, the Police Chief shall return a disapproved copy forthwith to the applicant with a written statement on the reason for disapproval.

(i) Any person aggrieved by a decision of the Police Chief or his or her designee may file an appeal to the City Manager. A complete and proper appeal shall be filed with the City Clerk within ten (10) calendar days of the action that is the subject of the appeal. If the applicant fails to file an appeal within the ten (10) day filing period provided herein, denial shall take effect immediately upon expiration of such filing period. All appeals shall be in writing and shall contain the following information: (a) name(s) of the person filing the appeal, (b) a brief statement in ordinary and concise language of the relief sought, and (c) the signatures of all parties named as appellants and their mailing addresses. After receiving the appeal, the City Clerk shall immediately forward the matter to the City Manager for handling.

(ii) The City Manager shall, upon receipt of the appeal, set the matter for hearing before the City Manager or a hearing officer. Any hearing officer shall be a licensed attorney or recognized mediator designated by the City Manager. The hearing shall be set for not more than ten (10) calendar days after the receipt of the appeal unless a longer time is requested or consented to by the appellant. Notice of such hearing shall be given in writing and mailed at least five (5) calendar days prior to the date of the hearing, by U.S. mail, with a proof of service attached, addressed to the address listed on the permit application, or the written appeal if different from the permit application. The notice shall state the grounds of the complaint or reason for the denial and shall state the time and place where such hearing will be held.

(iii) The City Manager or hearing officer shall, within ten (10) calendar days following the conclusion of the hearing, make a written finding and decision, which shall be delivered to the City and the appellant by first class mail. Notwithstanding any provision in this Code, the decision of the City Manager or hearing officer shall be the final administrative decision of the City. Any party dissatisfied with the decision of the City Manager or hearing officer may seek review of such decision under the provisions of Code Civil Procedure, §§ 1094.5 and 1094.8, as amended from time to time.

(h) In addition to any other provisions of this Code, the use of sound-amplifying equipment and sound trucks in the City shall be subject to the following regulations:

(1) The only sounds permitted are music and human speech;

(2) Sound shall not be emitted within one hundred (100) yards of hospitals, churches, schools and City Hall;

(3) The volume of sound shall be controlled so that it will not be audible for a distance in excess of one hundred (100) feet from the sound amplifying equipment or sound truck, and so that the volume is not unreasonably loud, raucous, jarring, disturbing or a nuisance to persons within the range of allowed audibility; or

(4) The sound amplifying equipment or sound truck shall not be used between the hours of 8:00 p.m. and 8:00 a.m.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.14. Motor vehicles.

The use of any motor vehicle in such a condition as to create excessive, impulsive or intrusive noises is prohibited. The discharge into the open air of the exhaust of any internal combustion engine, stationary or mounted on wheels, motorboat or motor vehicle, including motor cycle, whether or not discharged through a muffler or other similar device, which discharge creates excessive, unusual, impulsive or intrusive noise is prohibited. Motor vehicles shall comply with the noise regulations of the California Vehicle Code.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.15. Noise level measurement.

(a) The location selected for measuring exterior noise levels in a residential area shall be at any part of a private yard, patio, deck or balcony normally used for human activity and identified by the owner or, if occupied by someone other than the owner, the occupant of the affected property as suspected of exceeding the noise level standard. This location may be the closest point in the private yard or patio, or on the deck or balcony, to the noise source, but should not be located in nonhuman activity areas such as trash container storage areas, planter beds, above or contacting a property line fence, or other areas not normally used as part of the yard, patio, deck or balcony. The location selected for measuring exterior noise levels in a nonresidential area shall be at the closest point to the noise source. The measurement microphone height shall be five (5) feet above finish elevation or, in the case of a deck or balcony, the measurement microphone height shall be five (5) feet above the finished floor level.

(b) The location selected for measuring interior noise levels shall be made within the affected residential unit. The measurements shall be made at a point at least four (4) feet from the wall, ceiling or floor, or within the frame of a window opening, nearest the noise source. The measurements shall be made with windows in an open position.

(c) Any decibel measurement made pursuant to the provisions of this chapter shall be measured in decibels (dBAs) as measured with a sound level meter using the A-weighted sound pressure level.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.16. Prima facie violation.

Any noise exceeding the noise level standard as specified in §§ 5-29.04 and 5-29.05, shall be deemed to be prima facie evidence of a violation of the provisions of this chapter.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.17. Penalty.

(a) Any person who negligently or knowingly violates any provision of this chapter shall be guilty of an infraction and upon conviction shall be punishable by a fine specified in OMC § 1-2.01. Each day a violation occurs shall constitute a separate offense and shall be punishable as such.

(b) Any person who negligently or knowingly violates any provision of this chapter may also be subject to fine(s) specified in the administrative citation schedule of fines set forth in OMC § 1-5.04. The manner of issuing administrative citations shall comply with all the procedures specified in OMC Chapter 5, Title 1.

(c) As an additional remedy, the operation or maintenance of any device, instrument, vehicle or machinery in violation of any provisions of this chapter, which operation or maintenance causes or creates sound levels exceeding the allowable standards as specified in this chapter, shall be deemed and is declared to be a public nuisance and may be subject to abatement by a restraining order or injunction issued by a court of competent jurisdiction.

(d) Any violation of this chapter is declared to be a public nuisance and may be abated in accordance with law. The expense of enforcing this chapter is declared to be public nuisance and may be by resolution of the City Council declared to be a lien and special assessment against the property on which such nuisance is maintained, and any such charge shall also be a personal obligation of the property owner.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.18. Enforcement and administration.

(a) It shall be the responsibility of Police or Code Enforcement Officers to enforce the provisions of this chapter and to perform all other functions required by this chapter. Such duties shall include, but not be limited to investigating potential violations, issuing warning notices and citations, and providing evidence to the City prosecutor for legal action.

(b) For violations of § 5-29.07, Police or Code Enforcement Officers shall obtain a declaration under penalty of perjury from two (2) declarants living in separate households within a sixty (60) day period stating in detail all of the following:

(1) That the declarant is a resident of a residential neighborhood located within two hundred (200) yards of the noise source; and

(2) Within the past month declarant has heard noise for substantially long periods to the extreme annoyance of the declarant.

(3) Declarations from two (2) declarants are required to prove a violation of § 5-29.07, but are not required to prove that a person has violated any other provision of this chapter.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.19. City Manager waiver.

The City Manager is authorized to grant a temporary waiver to the provisions of this chapter for a period of time necessary to correct the violations of this chapter, if such temporary waiver would be in the public interest and there is no feasible and prudent alternative to the activity, or the method of conducting the activity, for which the temporary waiver is sought. This time period may include a commitment to a program that includes placing necessary orders and entering into necessary contracts within thirty (30) days for repair or installation.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.20. Noise abatement program.

(a) In circumstances where adopted community-wide noise standards and policies prove impractical in controlling noise generated from a specific source, the City Council may establish a noise abatement program that recognizes the characteristics of the noise source and affected property and that incorporates specialized mitigation measures.

(b) Noise abatement programs shall set forth in detail the approved terms, conditions and requirements for achieving maximum compliance with noise standards and policies. Said terms, conditions and requirements may include, but shall not be limited to, limitations, restrictions, or prohibitions on operating hours, location of operations, and the types of equipment.

(§ 2, Ord. 2888, eff. March 6, 2008)

NOISE LEVEL EXPOSURE AND LAND USE COMPATIBILITY GUIDELINES

Table LU-7

LAND USE CATEGORIES		COMMUNITY NOISE EQUIVALENT LEVEL (CNEL)						
Category	Land Use	55	60	65	70	75	80	
Residential/ Lodging	Single Family / Duplex							
	Multi-Family							
	Mobile Homes							
	Hotel/Motels							
Public/Institutional	Schools/Hospitals							
	Churches/ Libraries							
	Auditoriums/Concert Halls							
Commercial	Offices							
	Retail							
Industrial	Manufacturing							
	Warehousing							
Recreational/ Open Space	Parks/Playgrounds							
	Golf Courses/ Riding Stables							
	Outdoor Spectator Sports							
	Outdoor Music Shells/ Amphitheaters							
	Livestock/Wildlife Preserves							
	Crop Agriculture							

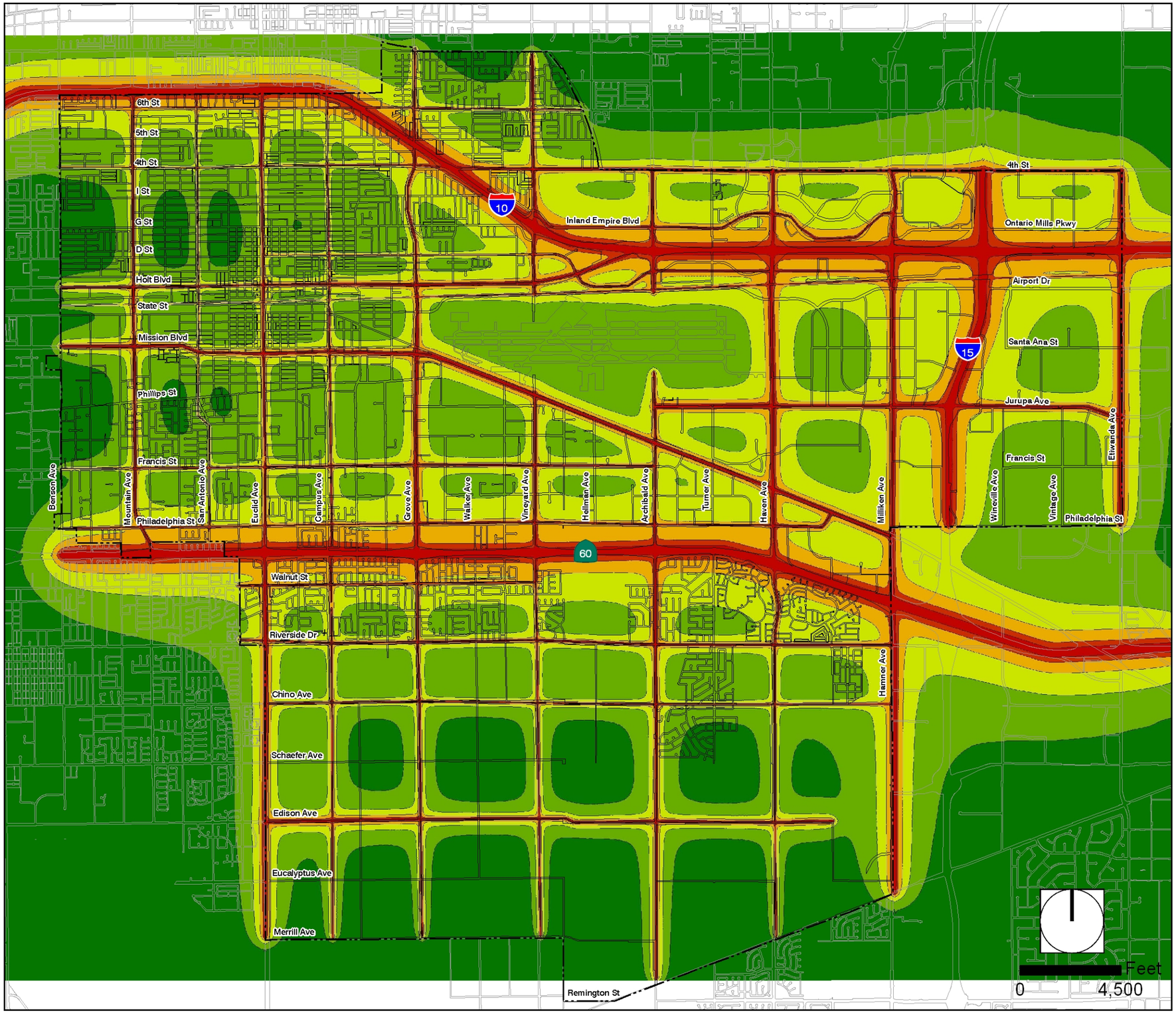
LEGEND

Clearly Acceptable:	No special noise insulation required, assuming buildings of normal conventional construction.
Normally Acceptable:	Acoustical reports will be required for major new residential construction. Conventional construction with closed windows and fresh air supply systems of air conditioning will normally suffice.
Normally Unacceptable:	New construction should be discouraged. Noise/aviation easements required for all new construction. If new construction does proceed, a detailed analysis of noise reduction requirements must be made and necessary noise insulation features included.
Clearly Unacceptable:	No new construction should be permitted.

Note: For noise compatibility criteria and contours for Ontario International Airport refer to the adopted ALUCP for ONT.

Figure S-3a

Future Roadway Noise Contours



Noise Level Ldn in dBA CNEL

	<= 60
60 <	<= 65
65 <	<= 70
70 <	<= 75
75 <	<= 80
80 <	

Source: SoundPlan Noise Model, Braunstein and Berndt, GmbH, Version 6.5. Noise contours do not take into account attenuation provided by building structures or masonry walls or noise from the Los Angeles Ontario International Airport, Chino Airport, or Union Pacific Railroad.

THE ONTARIO PLAN
A FRAMEWORK FOR THE FUTURE

Appendix B

Field Data and Photos

Field Sheet

Project: Toyota Arena Mixed Use Development **Engineer:** M. Torres

Date: 4/7/2021
JN: 2957-2021-02

Measurement Address: Toyota Arena
City: Ontario
Site No.: 1

Sound Level Meter:
Piccolo II
Serial # P0218042101
Serial # P0218092808
Serial # P0221010801
Serial # P0221010802

Calibrator:
CA114 Sound Calibrator
Serial # 500732

Calibration Record:

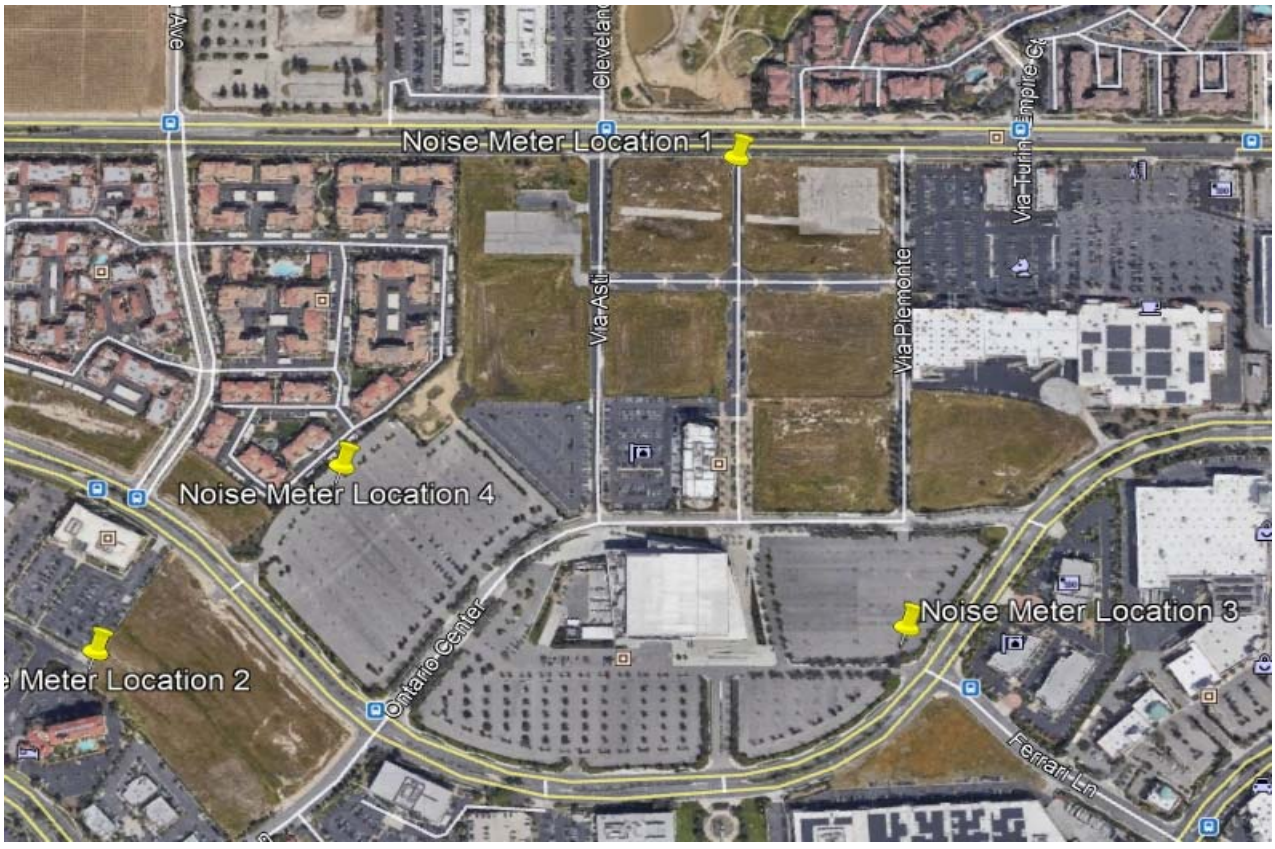
	Input, dB/	Reading, dB/	Offset, dB/	Time
1	94.0			9:47 AM
2	94.0			10:18 AM
3	94.0			10:47 AM
4	94.0			10:54 AM

Notes:
Temp: 55
Windspeed: 8 MPH
Direction: SSW
Skies: and Partly Cloudy
Camera:
Photo Nos.

Meter Settings:
☒ A-WTD ☐ LINEAR ☒ SLOW ☐ 1/1 OCT ☒ INTERVALS ___60____- MINUTE
☐ C-WTD ☐ IMPULSE ☐ FAST ☐ 1/3 OCT ☒ L_N PERCENTILE VALUES

Notes:

Measurement Type:
Long-term X
Short-term



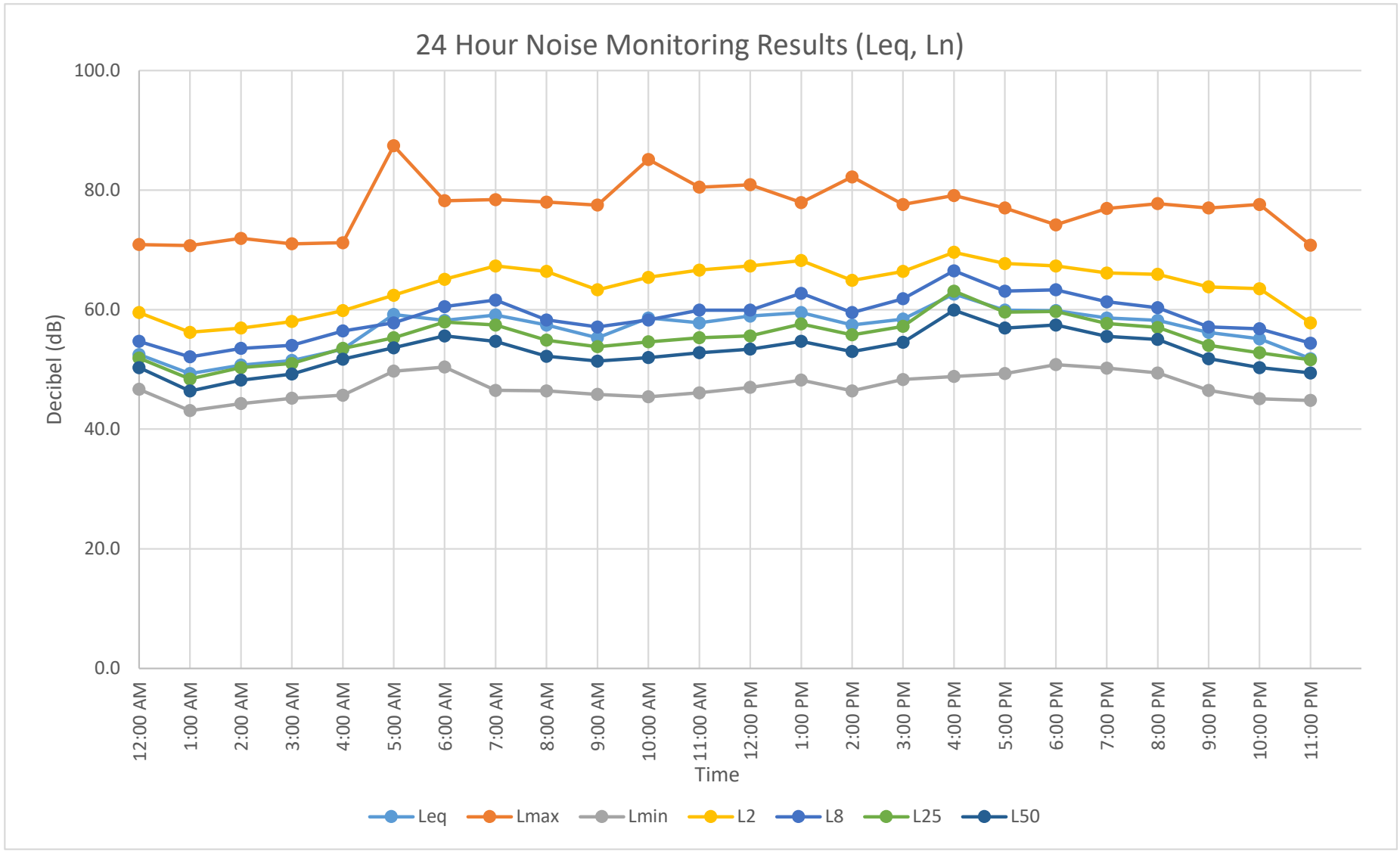
RK engineering group, inc.

Field Sheet - ST1 Location Photos

Project: Toyota Arena Mixed Use Development	**Engineer:** M. Torres	**Date:**	4/7/2021
		JN:	2957-2021-02
Measurement Address: Southwest Corner of Via Piemonte and Fourth Street.	**City:** Ontario	**Site No.:**	1

RK engineering group, inc.

PROJECT:	Toyota Arena Mixed Use Development					JOB #:	2957-2021-02
NOISE METER	Piccolo II SLM, 24-Hour Measurement					DATE:	07-Apr-21
LOCATION:	Southwest Corner of Resort Way and Haven Avenue					BY:	M. Torres
Time	Leq	Lmax	Lmin	L2	L8	L25	L50
12:00 AM	52.5	70.9	46.7	59.5	54.7	51.9	50.3
1:00 AM	49.3	70.7	43.1	56.2	52.1	48.4	46.4
2:00 AM	50.7	71.9	44.3	56.9	53.5	50.3	48.2
3:00 AM	51.5	71.0	45.2	58.0	54.0	51.0	49.2
4:00 AM	53.4	71.2	45.7	59.8	56.4	53.5	51.7
5:00 AM	59.2	87.4	49.7	62.4	57.8	55.3	53.6
6:00 AM	58.2	78.2	50.4	65.1	60.5	57.9	55.6
7:00 AM	59.1	78.4	46.5	67.3	61.6	57.4	54.7
8:00 AM	57.4	78.0	46.4	66.4	58.3	54.9	52.2
9:00 AM	55.3	77.5	45.8	63.3	57.1	53.8	51.4
10:00 AM	58.6	85.1	45.4	65.4	58.3	54.6	52.0
11:00 AM	57.8	80.5	46.1	66.6	59.9	55.3	52.8
12:00 PM	58.9	80.9	47.0	67.3	59.9	55.6	53.4
1:00 PM	59.5	77.9	48.2	68.2	62.7	57.6	54.7
2:00 PM	57.4	82.2	46.4	64.9	59.5	55.8	53.0
3:00 PM	58.4	77.6	48.3	66.4	61.8	57.2	54.5
4:00 PM	62.6	79.1	48.8	69.6	66.5	63.1	59.9
5:00 PM	59.9	77.0	49.3	67.7	63.1	59.6	56.9
6:00 PM	59.8	74.2	50.8	67.3	63.3	59.7	57.4
7:00 PM	58.6	76.9	50.2	66.1	61.3	57.7	55.5
8:00 PM	58.2	77.7	49.4	65.9	60.3	57.0	55.0
9:00 PM	56.2	77.0	46.5	63.8	57.1	54.0	51.8
10:00 PM	55.1	77.6	45.1	63.5	56.8	52.8	50.3
11:00 PM	51.8	70.8	44.8	57.8	54.4	51.6	49.4
Daytime	58.7	85.1	45.1	66.6	61.3	57.5	54.9
Nighttime	54.7	87.4	43.1	60.5	56.2	53.5	51.5


24 Hour Noise Monitoring Results (Leq, Ln)
100.0
80.0
60.0
40.0
20.0
0.0
Decibel (dB)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
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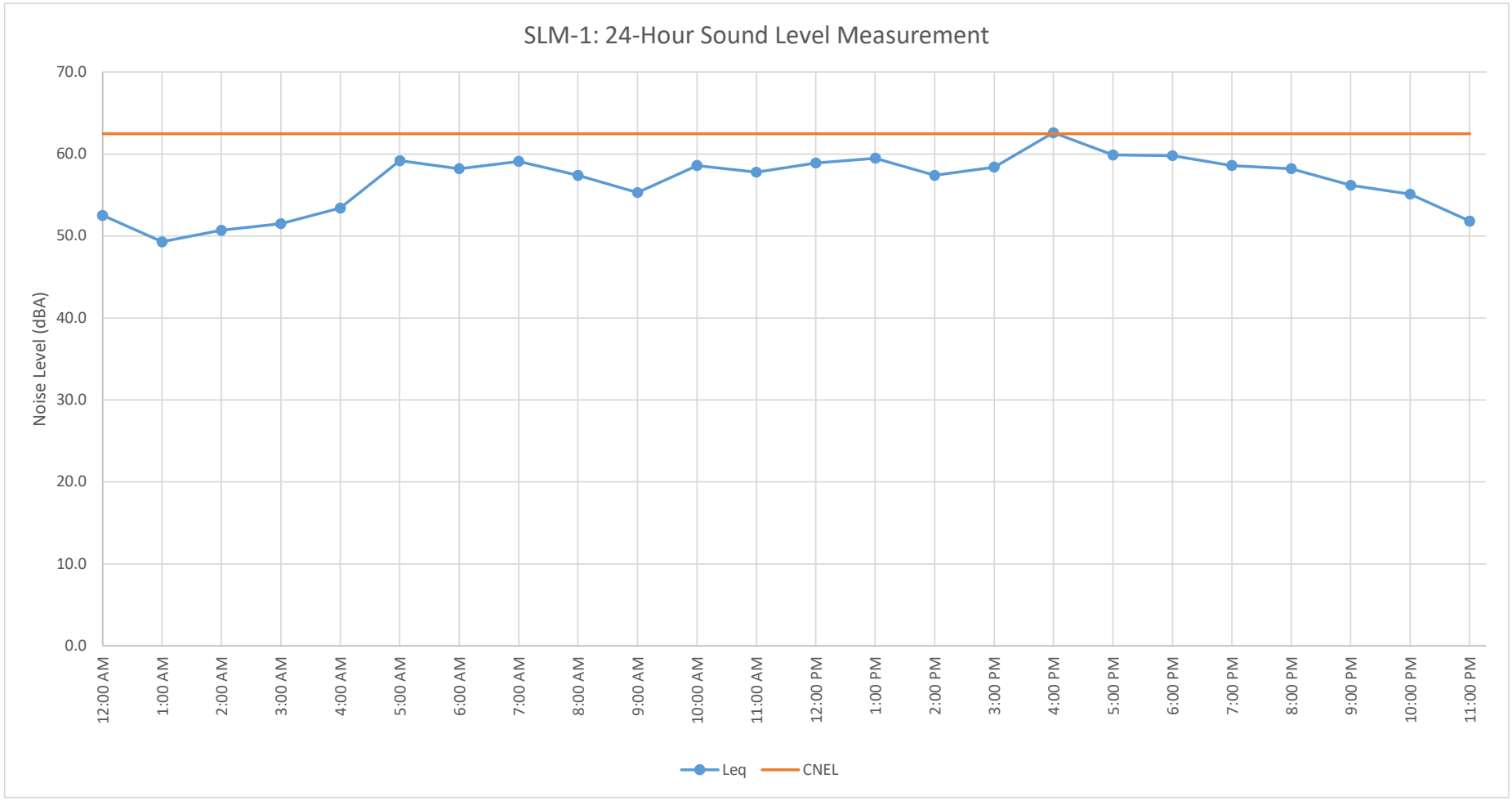
11:00 PM
Time
Leq
Lmax
Lmin
L2
L8
L25
L50

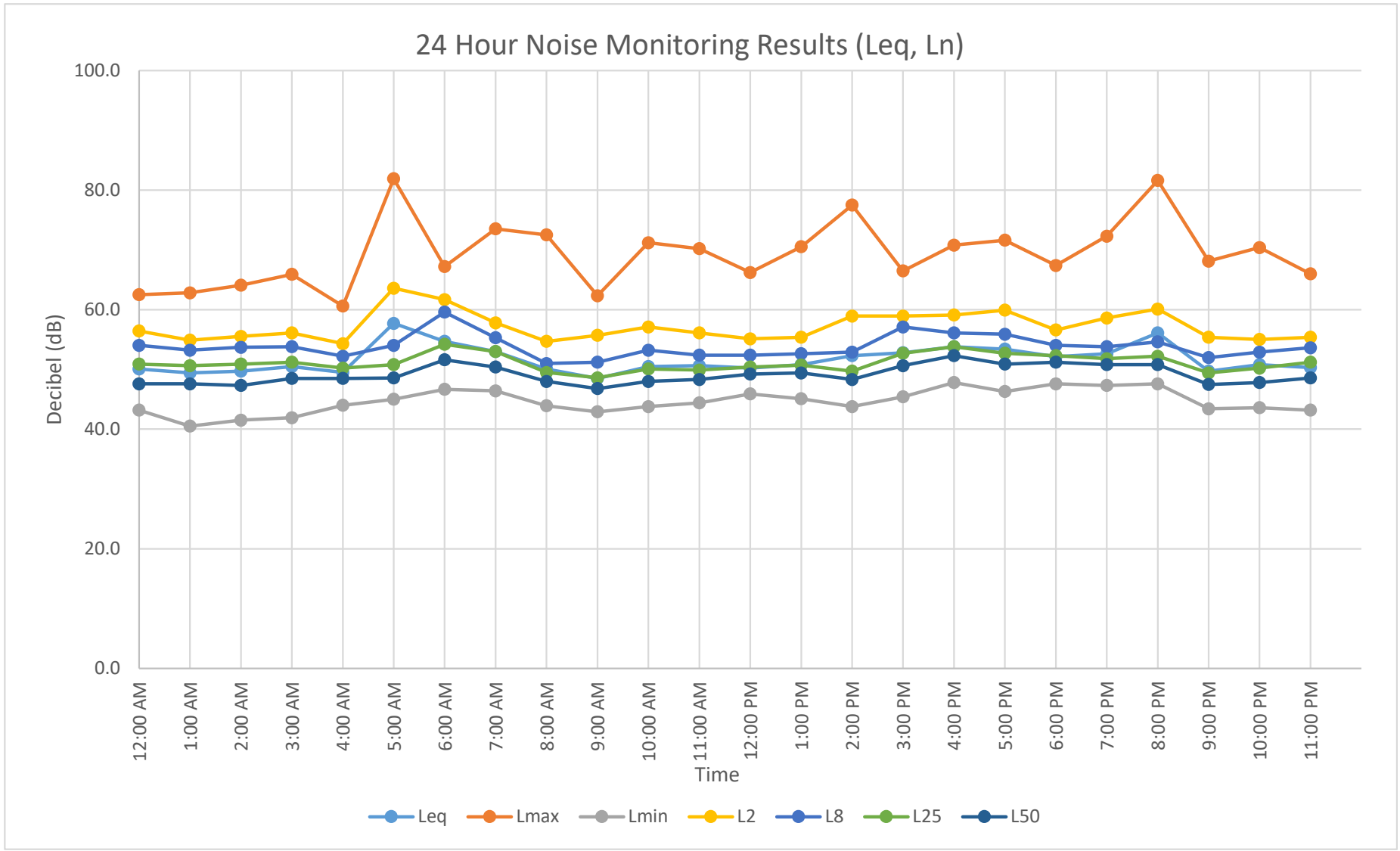

SLM-1: 24-Hour Sound Level Measurement
Noise Level (dBA)
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Leq
CNEL

Field Sheet - ST2 Location Photos

Project: Toyota Arena Mixed Use Development	**Engineer:** M. Torres	**Date:**	4/7/2021
		JN:	2957-2021-02
Measurement Address: East of Porsche Way, North of La Quinta Inn Site	**City:** Ontario	**Site No.:**	2

RK engineering group, inc.

PROJECT:	Toyota Arena Mixed Use Development					JOB #:	2957-2021-02
NOISE METER	Piccolo II SLM, 24-Hour Measurement					DATE:	07-Apr-21
LOCATION:	East of Porsche Way, North of La Quinta Inn Site					BY:	M. Torres
Time	Leq	Lmax	Lmin	L2	L8	L25	L50
12:00 AM	50.1	62.5	43.2	56.4	54.0	50.9	47.6
1:00 AM	49.4	62.8	40.5	54.9	53.2	50.6	47.6
2:00 AM	49.7	64.1	41.5	55.5	53.7	50.9	47.3
3:00 AM	50.5	65.9	41.9	56.1	53.8	51.2	48.5
4:00 AM	49.5	60.6	44.0	54.3	52.2	50.2	48.5
5:00 AM	57.7	81.9	45.0	63.6	54.0	50.8	48.6
6:00 AM	54.7	67.2	46.7	61.7	59.6	54.2	51.6
7:00 AM	53.0	73.5	46.4	57.8	55.3	53.0	50.4
8:00 AM	50.1	72.5	43.9	54.7	51.0	49.5	48.0
9:00 AM	48.5	62.3	42.9	55.7	51.2	48.6	46.8
10:00 AM	50.5	71.2	43.8	57.1	53.2	50.1	48.0
11:00 AM	50.6	70.2	44.4	56.1	52.4	49.9	48.3
12:00 PM	50.2	66.2	45.9	55.1	52.4	50.4	49.2
1:00 PM	50.8	70.5	45.1	55.4	52.6	50.7	49.4
2:00 PM	52.3	77.5	43.8	58.9	52.9	49.7	48.3
3:00 PM	52.8	66.5	45.4	58.9	57.1	52.7	50.6
4:00 PM	53.8	70.8	47.8	59.1	56.1	53.8	52.3
5:00 PM	53.4	71.6	46.3	59.9	55.9	52.7	50.9
6:00 PM	52.1	67.4	47.6	56.6	54.0	52.3	51.2
7:00 PM	52.6	72.3	47.3	58.6	53.8	51.8	50.8
8:00 PM	56.1	81.6	47.6	60.1	54.6	52.2	50.8
9:00 PM	49.7	68.1	43.4	55.4	52.0	49.4	47.5
10:00 PM	50.8	70.4	43.6	55.0	52.9	50.2	47.8
11:00 PM	50.3	66.0	43.2	55.4	53.6	51.2	48.6
Daytime	52.1	81.6	42.9	57.5	53.9	51.3	49.7
Nighttime	52.7	81.9	40.5	58.7	54.9	51.4	48.7


24 Hour Noise Monitoring Results (Leq, Ln)
Decibel (dB)
100.0
80.0
60.0
40.0
20.0
0.0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
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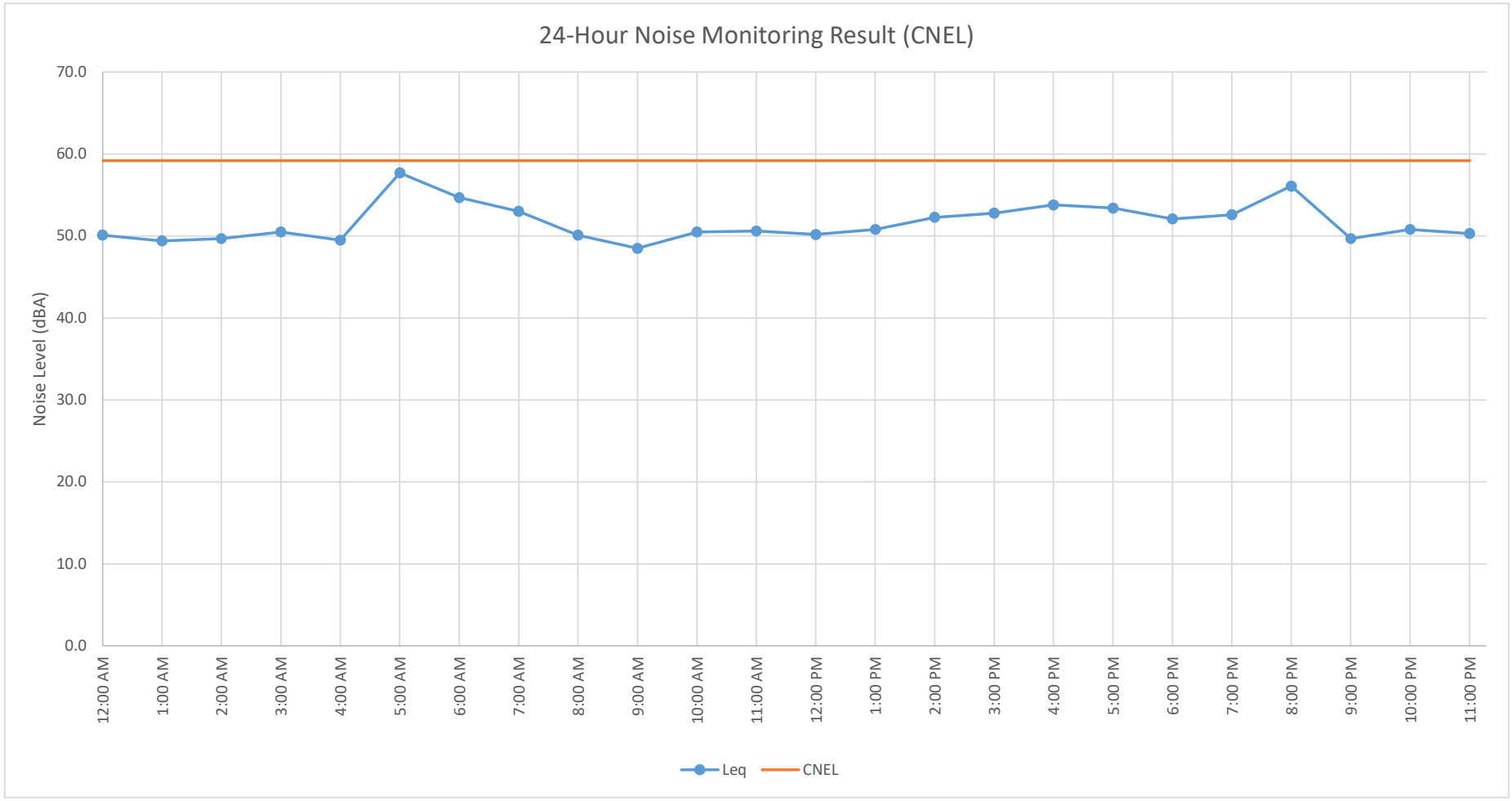
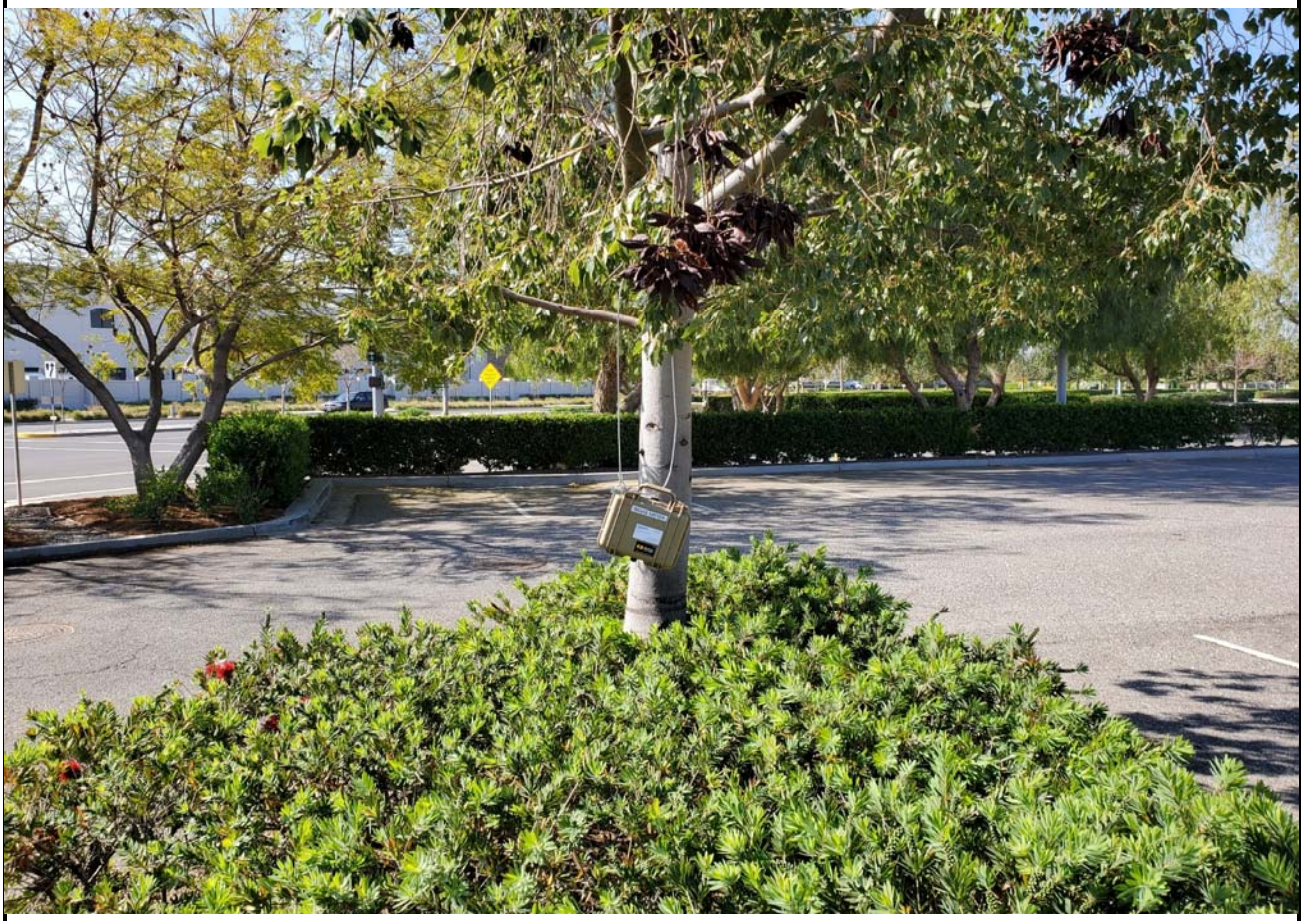
Time
Leq
Lmax
Lmin
L2
L8
L25
L50


24-Hour Noise Monitoring Result (CNEL)
Noise Level (dBA)
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Leq
CNEL

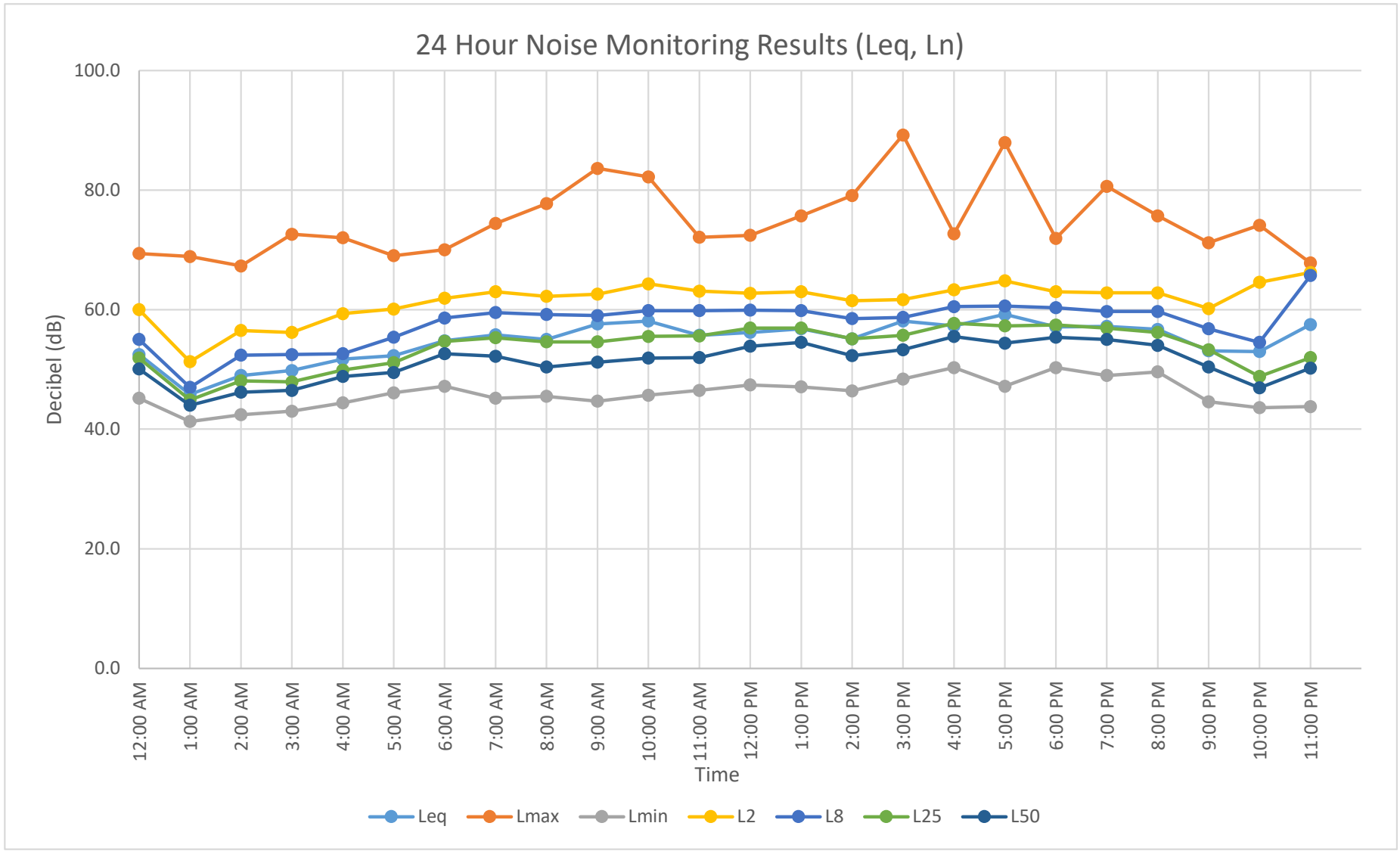
Field Sheet - ST3 Location Photos

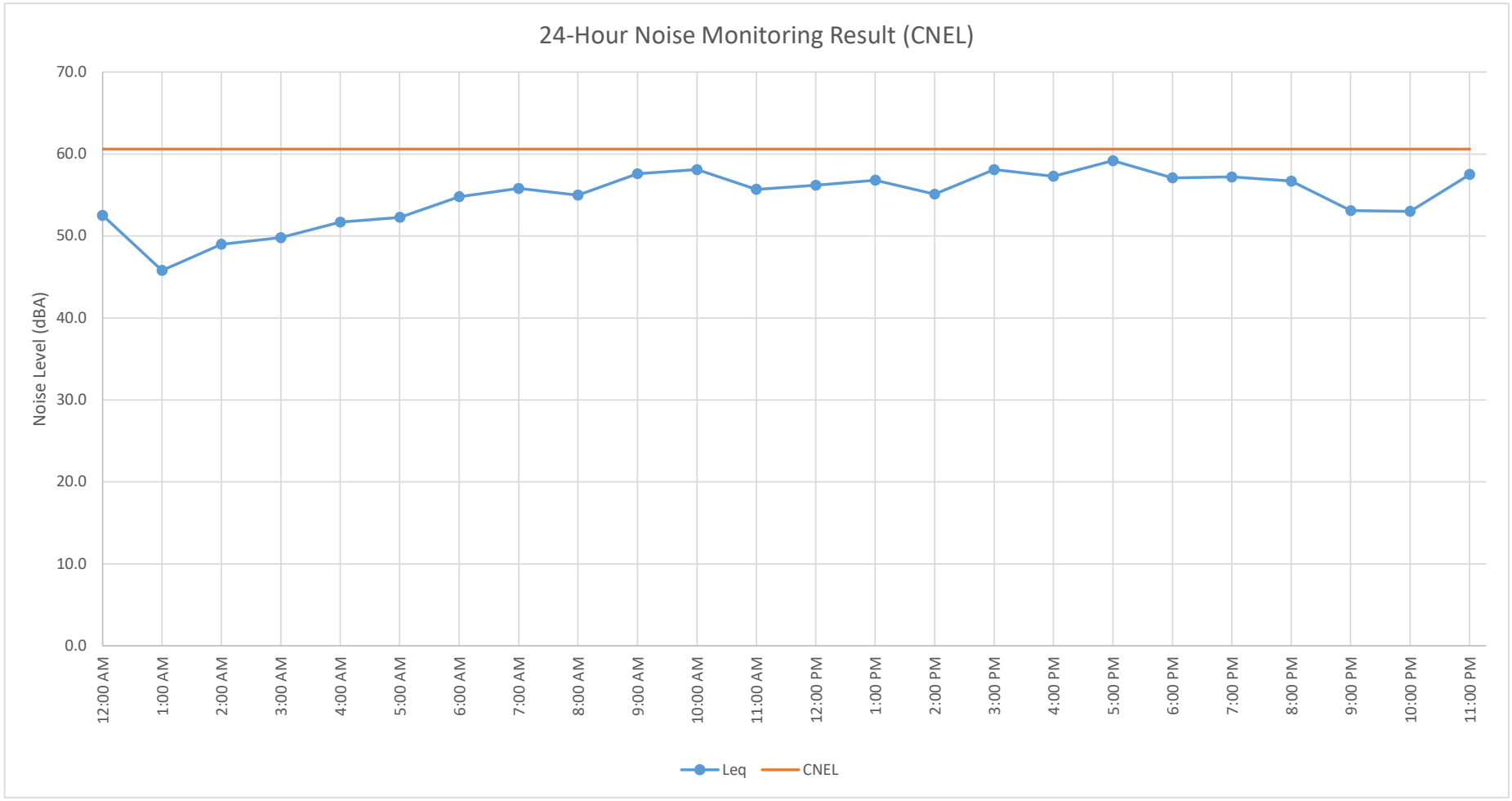
Project: Toyota Arena Mixed Use Development **Engineer:** M. Torres	**Date:**	4/7/2021
	JN:	2957-2021-02
Measurement Address: Northwest Corner of Concours Street and Ferrari Lane **City:** Ontario	**Site No.:**	3



RK engineering group, inc.

PROJECT:	Toyota Arena Mixed Use Development					JOB #:	2957-2021-02
NOISE METER	Piccolo II SLM, 24-Hour Measurement					DATE:	07-Apr-21
LOCATION:	Northwest Corner of Concours Street and Ferrari Lane					BY:	M. Torres
Time	Leq	Lmax	Lmin	L2	L8	L25	L50
12:00 AM	52.5	69.4	45.2	60.0	55.0	51.9	50.1
1:00 AM	45.8	68.9	41.3	51.3	47.0	44.9	44.0
2:00 AM	49.0	67.3	42.4	56.5	52.4	48.1	46.2
3:00 AM	49.8	72.6	43.0	56.2	52.5	47.9	46.5
4:00 AM	51.7	72.0	44.4	59.3	52.6	49.9	48.8
5:00 AM	52.3	69.0	46.1	60.1	55.4	51.1	49.5
6:00 AM	54.8	70.0	47.2	61.9	58.6	54.7	52.6
7:00 AM	55.8	74.4	45.2	63.0	59.5	55.3	52.2
8:00 AM	55.0	77.7	45.5	62.2	59.2	54.6	50.4
9:00 AM	57.6	83.6	44.7	62.6	59.0	54.6	51.2
10:00 AM	58.1	82.2	45.7	64.3	59.8	55.5	51.9
11:00 AM	55.7	72.1	46.5	63.1	59.8	55.6	52.0
12:00 PM	56.2	72.4	47.4	62.7	59.9	56.9	53.9
1:00 PM	56.8	75.7	47.1	63.0	59.8	56.9	54.5
2:00 PM	55.1	79.1	46.4	61.5	58.5	55.1	52.3
3:00 PM	58.1	89.2	48.4	61.7	58.7	55.7	53.3
4:00 PM	57.3	72.7	50.3	63.3	60.5	57.7	55.5
5:00 PM	59.2	87.9	47.2	64.8	60.6	57.3	54.4
6:00 PM	57.1	71.9	50.3	63.0	60.3	57.4	55.4
7:00 PM	57.2	80.6	49.0	62.8	59.7	56.9	55.0
8:00 PM	56.7	75.7	49.6	62.8	59.7	56.2	54.0
9:00 PM	53.1	71.2	44.6	60.2	56.8	53.3	50.4
10:00 PM	53.0	74.1	43.6	64.6	54.5	48.8	46.9
11:00 PM	57.5	67.8	43.8	66.2	65.7	52.0	50.2
Daytime	56.7	89.2	43.6	63.0	59.4	55.9	53.2
Nighttime	52.9	72.6	41.3	60.8	58.5	50.9	49.2


24 Hour Noise Monitoring Results (Leq, Ln)
100.0
80.0
60.0
40.0
20.0
0.0
Decibel (dB)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Time
Leq
Lmax
Lmin
L2
L8
L25
L50

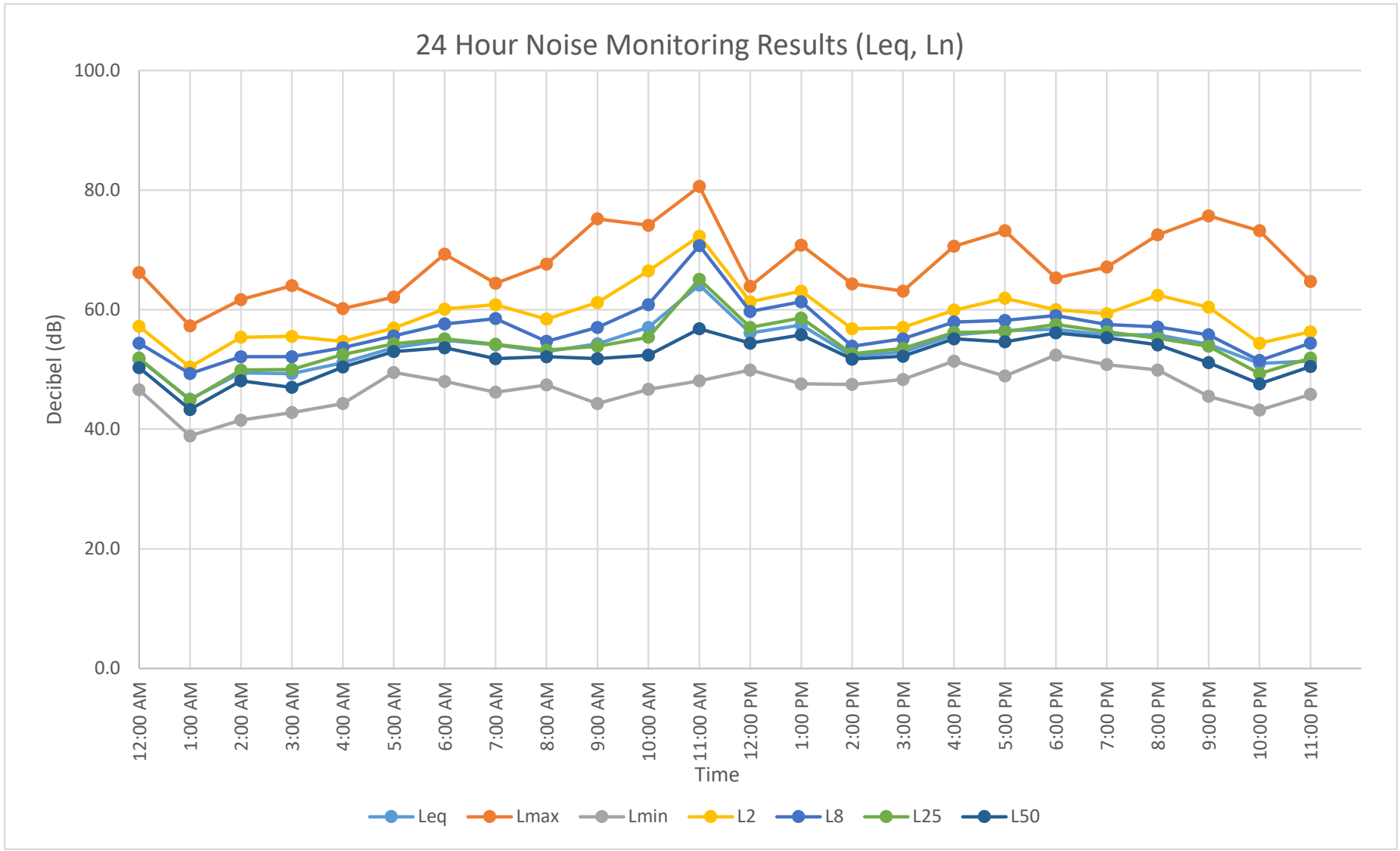

24-Hour Noise Monitoring Result (CNEL)
Noise Level (dBA)
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Leq
CNEL

Field Sheet - ST4 Location Photos

Project: Toyota Arena Mixed Use Development **Engineer:** M. Torres		**Date:** 4/7/2021 **JN:** 2957-2021-02
Measurement Address: In the parking lot along Western Project Site Boundary	**City:** Ontario	**Site No.:** 4

RK engineering group, inc.

PROJECT:	Toyota Arena Mixed Use Development					JOB #:	2957-2021-02
NOISE METER	Piccolo II SLM, 24-Hour Measurement					DATE:	07-Apr-21
LOCATION:	In the parking lot, along Western Project Site Boundary					BY:	M. Torres
Time	Leq	Lmax	Lmin	L2	L8	L25	L50
12:00 AM	51.7	66.2	46.6	57.2	54.4	51.9	50.3
1:00 AM	45.0	57.3	38.9	50.4	49.3	44.9	43.3
2:00 AM	49.4	61.7	41.5	55.4	52.1	49.9	48.1
3:00 AM	49.3	64.0	42.8	55.5	52.1	50.0	47.0
4:00 AM	51.1	60.2	44.3	54.7	53.6	52.5	50.4
5:00 AM	53.6	62.1	49.5	56.9	55.6	54.3	53.0
6:00 AM	54.9	69.3	48.0	60.1	57.6	55.1	53.6
7:00 AM	54.1	64.4	46.2	60.8	58.5	54.2	51.8
8:00 AM	53.0	67.6	47.4	58.4	54.7	53.2	52.1
9:00 AM	54.3	75.2	44.3	61.2	57.0	53.9	51.8
10:00 AM	57.0	74.1	46.7	66.5	60.8	55.4	52.4
11:00 AM	64.1	80.6	48.1	72.3	70.7	65.1	56.8
12:00 PM	56.1	63.9	49.9	61.3	59.7	57.0	54.4
1:00 PM	57.4	70.8	47.6	63.1	61.3	58.6	55.8
2:00 PM	52.2	64.3	47.5	56.8	53.9	52.6	51.7
3:00 PM	52.9	63.1	48.3	57.0	55.1	53.5	52.2
4:00 PM	55.8	70.6	51.4	59.9	57.9	56.2	55.1
5:00 PM	56.5	73.2	48.9	61.9	58.2	56.3	54.6
6:00 PM	56.7	65.3	52.4	60.0	59.0	57.5	56.1
7:00 PM	55.8	67.1	50.8	59.3	57.5	56.3	55.3
8:00 PM	55.8	72.5	49.9	62.4	57.1	55.2	54.1
9:00 PM	54.2	75.7	45.5	60.4	55.8	53.9	51.1
10:00 PM	51.0	73.2	43.2	54.4	51.5	49.3	47.6
11:00 PM	51.4	64.7	45.8	56.3	54.4	51.9	50.5
Daytime	56.7	80.6	43.2	63.6	61.2	57.2	53.9
Nighttime	51.6	69.3	38.9	56.5	54.2	52.1	50.5


24 Hour Noise Monitoring Results (Leq, Ln)
100.0
80.0
60.0
40.0
20.0
0.0
Decibel (dB)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
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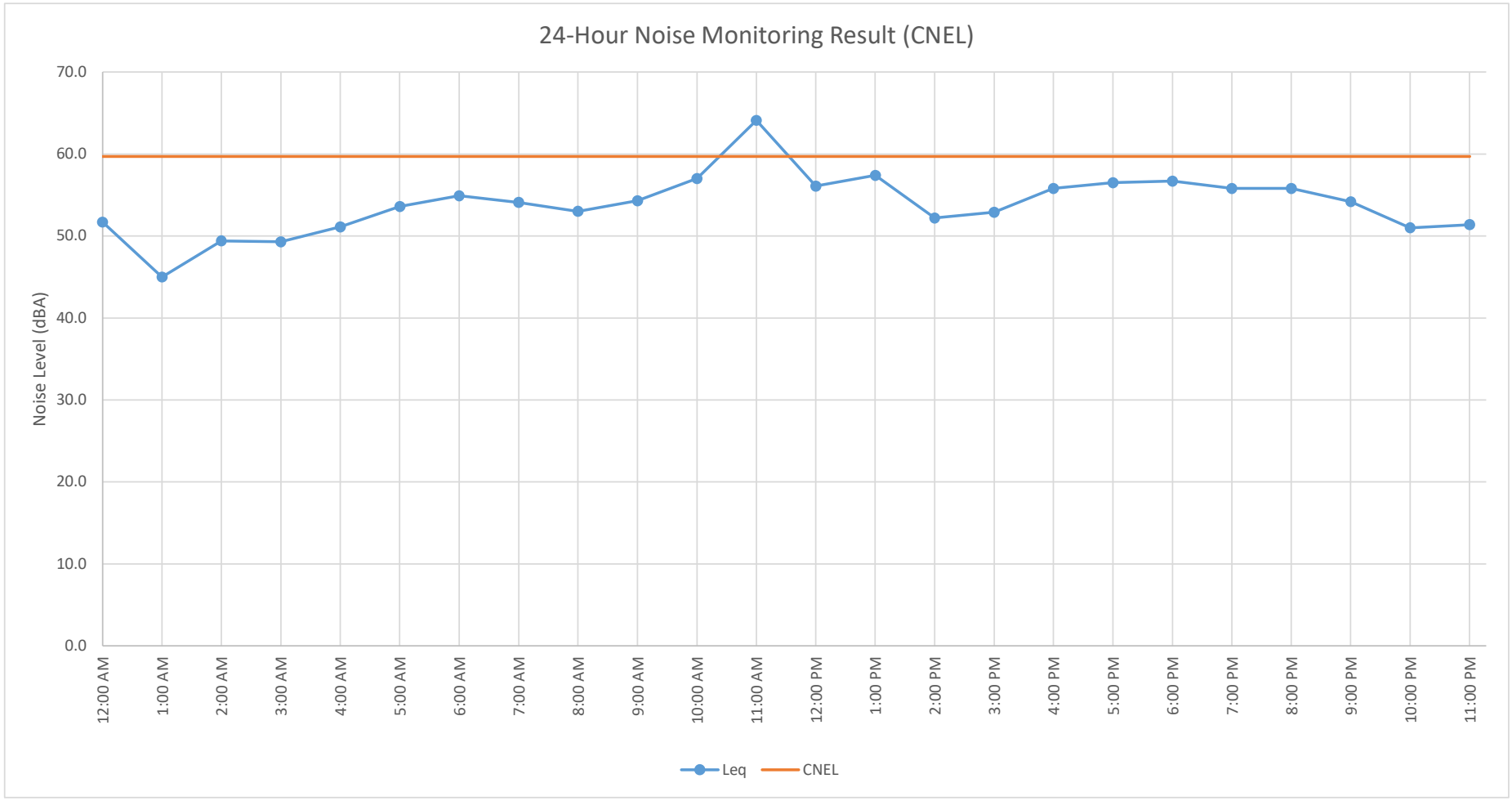
9:00 PM
10:00 PM
11:00 PM
Time
Leq
Lmax
Lmin
L2
L8
L25
L50


24-Hour Noise Monitoring Result (CNEL)
Noise Level (dBA)
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Leq
CNEL

Appendix C

Stationary Noise Analysis Results

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Parking Lot F and Parking Lot G	DATE:	27-May-21
LOCATION:	Residential Uses to the north of Lot F & G	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	170.0			
DT WALL=	0.0			
DT W/OB=	170.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	0.0		NOISE HTH EL=	3.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	6					63.8	
PROJ LEVEL	170					34.8	
SHIELDING	170					0.0	
ADJ LEVEL	170	***0.0***	***0.0***	***0.0***	***0.0***	***34.8***	***0.0***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -29.0459534

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot C HVAC	DATE:	27-May-21
LOCATION:	Residential West of Lot C	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	520.0			
DT WALL=	0.0			
DT W/OB=	520.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	77.0	77.0	77.0	77.0	77.0	77.0
PROJ LEVEL	520	32.2	32.2	32.2	32.2	32.2	32.2
SHIELDING	520	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	520	***32.2***	***32.2***	***32.2***	***32.2***	***32.2***	***32.2***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -44.7776418

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot F Parking Lot	DATE:	27-May-21
LOCATION:	Residential West of Lot C	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	745.0			
DT WALL=	0.0			
DT W/OB=	745.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	6					63.8	
PROJ LEVEL	745	-41.9	-41.9	-41.9	-41.9	21.9	-41.9
SHIELDING	745	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	745	***-41.9***	***-41.9***	***-41.9***	***-41.9***	***21.9***	***-41.9***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -41.8801004

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot A HVAC	DATE:	27-May-21
LOCATION:	Commercial South of Lot C and Lot D	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	223.0			
DT WALL=	0.0			
DT W/OB=	223.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	77.0	77.0	77.0	77.0	77.0	77.0
PROJ LEVEL	223	39.6	39.6	39.6	39.6	39.6	39.6
SHIELDING	223	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	223	***39.6***	***39.6***	***39.6***	***39.6***	***39.6***	***39.6***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -37.4236722

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot C HVAC	DATE:	27-May-21
LOCATION:	Commercial South of Lot C and Lot D	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	253.0			
DT WALL=	0.0			
DT W/OB=	253.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	77.0	77.0	77.0	77.0	77.0	77.0
PROJ LEVEL	253	38.5	38.5	38.5	38.5	38.5	38.5
SHIELDING	253	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	253	***38.5***	***38.5***	***38.5***	***38.5***	***38.5***	***38.5***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -38.5199853

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot D HVAC	DATE:	27-May-21
LOCATION:	Commercial South of Lot C and Lot D	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	253.0			
DT WALL=	0.0			
DT W/OB=	253.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	77.0	77.0	77.0	77.0	77.0	77.0
PROJ LEVEL	253	38.5	38.5	38.5	38.5	38.5	38.5
SHIELDING	253	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	253	***38.5***	***38.5***	***38.5***	***38.5***	***38.5***	***38.5***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -38.5199853

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot F & G Parking Lot	DATE:	27-May-21
LOCATION:	Commercial South of Lot C and Lot D	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	540.0			
DT WALL=	0.0			
DT W/OB=	540.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	6					63.8	
PROJ LEVEL	540	-39.1	-39.1	-39.1	-39.1	24.7	-39.1
SHIELDING	540	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	540	***-39.1***	***-39.1***	***-39.1***	***-39.1***	***24.7***	***-39.1***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -39.0848502

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot D HVAC	DATE:	27-May-21
LOCATION:	Commercial East of Lot D	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	495.0			
DT WALL=	0.0			
DT W/OB=	495.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	77.0	77.0	77.0	77.0	77.0	77.0
PROJ LEVEL	495	32.7	32.7	32.7	32.7	32.7	32.7
SHIELDING	495	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	495	***32.7***	***32.7***	***32.7***	***32.7***	***32.7***	***32.7***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -44.3496789

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot G Parking Lot	DATE:	27-May-21
LOCATION:	Commercial East of Lot D	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	180.0			
DT WALL=	0.0			
DT W/OB=	180.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	6					63.8	
PROJ LEVEL	180	-29.5	-29.5	-29.5	-29.5	34.3	-29.5
SHIELDING	180	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	180	***-29.5***	***-29.5***	***-29.5***	***-29.5***	***34.3***	***-29.5***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -29.5424251

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot A HVAC	DATE:	27-May-21
LOCATION:	Commercial East of Lot A	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	223.0			
DT WALL=	0.0			
DT W/OB=	223.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	77.0	77.0	77.0	77.0	77.0	77.0
PROJ LEVEL	223	39.6	39.6	39.6	39.6	39.6	39.6
SHIELDING	223	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	223	***39.6***	***39.6***	***39.6***	***39.6***	***39.6***	***39.6***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -37.4236722

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot B HVAC	DATE:	27-May-21
LOCATION:	Commercial East of Lot A	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	235.0			
DT WALL=	0.0			
DT W/OB=	235.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	77.0	77.0	77.0	77.0	77.0	77.0
PROJ LEVEL	235	39.1	39.1	39.1	39.1	39.1	39.1
SHIELDING	235	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	235	***39.1***	***39.1***	***39.1***	***39.1***	***39.1***	***39.1***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -37.8789322

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot B HVAC	DATE:	27-May-21
LOCATION:	Commercial South of Lot B	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	590.0			
DT WALL=	0.0			
DT W/OB=	590.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	77.0	77.0	77.0	77.0	77.0	77.0
PROJ LEVEL	590	31.1	31.1	31.1	31.1	31.1	31.1
SHIELDING	590	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	590	***31.1***	***31.1***	***31.1***	***31.1***	***31.1***	***31.1***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -45.8746151

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot B HVAC	DATE:	27-May-21
LOCATION:	Commercial South of Lot B	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	260.0			
DT WALL=	0.0			
DT W/OB=	260.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	77.0	77.0	77.0	77.0	77.0	77.0
PROJ LEVEL	260	38.2	38.2	38.2	38.2	38.2	38.2
SHIELDING	260	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	260	***38.2***	***38.2***	***38.2***	***38.2***	***38.2***	***38.2***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -38.7570419

NOISE INTERVAL AVERAGER (2.0)

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2957-2021-2
LOCATION:	Receptor 2	DATE:	27-May-21
SOURCE:	Combined Noise Levels	BY:	D.Shivaiah

NOISE LEVEL MEASUREMENTS (dBA)

	NOISE SOURCE	LEQ	L(MAX)	L(2)	L(8)	L(25)	L(50)
1	Lot C					32.2	
2	Lot F					21.9	
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
	TOTAL	#NUM!	#NUM!	#NUM!	#NUM!	32.6	#NUM!

NOISE INTERVAL AVERAGER (2.0)

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2957-2021-2
LOCATION:	Receptor 3	DATE:	27-May-21
SOURCE:	Combined Noise Levels	BY:	D.Shivaiah

NOISE LEVEL MEASUREMENTS (dBA)

	NOISE SOURCE	LEQ	L(MAX)	L(2)	L(8)	L(25)	L(50)
1	Lot A					39.6	
2	Lot C					38.5	
3	Lot D					38.5	
4	Lot F & Lot G					24.7	
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
	TOTAL	#NUM!	#NUM!	#NUM!	#NUM!	43.7	#NUM!

NOISE INTERVAL AVERAGER (2.0)

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2957-2021-2
LOCATION:	Receptor 4	DATE:	27-May-21
SOURCE:	Combined Noise Levels	BY:	D.Shivaiah

NOISE LEVEL MEASUREMENTS (dBA)

	NOISE SOURCE	LEQ	L(MAX)	L(2)	L(8)	L(25)	L(50)
1	Lot D					32.7	
2	Lot G					34.3	
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
	TOTAL	#NUM!	#NUM!	#NUM!	#NUM!	36.6	#NUM!

NOISE INTERVAL AVERAGER (2.0)

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2957-2021-2
LOCATION:	Receptor 5	DATE:	27-May-21
SOURCE:	Combined Noise Levels	BY:	D.Shivaiah

NOISE LEVEL MEASUREMENTS (dBA)

	NOISE SOURCE	LEQ	L(MAX)	L(2)	L(8)	L(25)	L(50)
1	Lot A					39.6	
2	Lot B					39.1	
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
	TOTAL	#NUM!	#NUM!	#NUM!	#NUM!	42.4	#NUM!

NOISE INTERVAL AVERAGER (2.0)

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2957-2021-2
LOCATION:	Receptor 6	DATE:	27-May-21
SOURCE:	Combined Noise Levels	BY:	D.Shivaiah

NOISE LEVEL MEASUREMENTS (dBA)

	NOISE SOURCE	LEQ	L(MAX)	L(2)	L(8)	L(25)	L(50)
1	Lot A					31.1	
2	Lot B					38.2	
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
	TOTAL	#NUM!	#NUM!	#NUM!	#NUM!	39.0	#NUM!

Appendix D

Construction Noise and Vibration
Analysis Results

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/27/2021
Case Description: Toyota Arena Mixed Use Development

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Demolition	Residential	80	60	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	160	0
Excavator	No	40		80.7	160	0
Dozer	No	40		81.7	160	0
Excavator	No	40		80.7	160	0
Excavator	No	40		80.7	160	0
Dozer	No	40		81.7	160	0

Results

		Calculated (dBA)	
Equipment		*Lmax	Leq
Concrete Saw		79.5	72.5
Excavator		70.6	66.6
Dozer		71.6	67.6
Excavator		70.6	66.6
Excavator		70.6	66.6
Dozer		71.6	67.6
	Total	79.5	76.3

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/27/2021
Case Description: Toyota Arena Mixed Use Development

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Site Preparation	Residential	80	60	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	160	0
Tractor	No	40	84		160	0
Dozer	No	40		81.7	160	0
Tractor	No	40	84		160	0
Tractor	No	40	84		160	0
Dozer	No	40		81.7	160	0
Tractor	No	40	84		160	0

Results

		Calculated (dBA)	
Equipment		*Lmax	Leq
Dozer		71.6	67.6
Tractor		73.9	69.9
Dozer		71.6	67.6
Tractor		73.9	69.9
Tractor		73.9	69.9
Dozer		71.6	67.6
Tractor		73.9	69.9
	Total	73.9	77.5

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/27/2021
Case Description: Toyota Arena Mixed Use Development

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Grading	Residential	80	60	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	160	0
Grader	No	40	85		160	0
Dozer	No	40		81.7	160	0
Scraper	No	40		83.6	160	0
Tractor	No	40	84		160	0
Excavator	No	40		80.7	160	0
Scraper	No	40		83.6	160	0
Tractor	No	40	84		160	0

	Results			
	Calculated (dBA)		Noise Limits (dBA)	
Equipment	*Lmax	Leq		
Excavator	70.6	66.6		
Grader	74.9	70.9		
Dozer	71.6	67.6		
Scraper	73.5	69.5		
Tractor	73.9	69.9		
Excavator	70.6	66.6		
Scraper	73.5	69.5		
Tractor	73.9	69.9		
Total	74.9	78.1		

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/27/2021
Case Description: Toyota Arena Mixed Use Development

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Building Construction	Residential	80	60	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	160	0
Pickup Truck	No	40		75	160	0
Generator	No	50		80.6	160	0
Tractor	No	40	84		160	0
Welder / Torch	No	40		74	160	0
Pickup Truck	No	40		75	160	0
Pickup Truck	No	40		75	160	0
Tractor	No	40	84		160	0
Tractor	No	40	84		160	0

Results

		Calculated (dBA)	
Equipment		*Lmax	Leq
Crane		70.4	62.5
Pickup Truck		64.9	60.9
Generator		70.5	67.5
Tractor		73.9	69.9
Welder / Torch		63.9	59.9
Pickup Truck		64.9	60.9
Pickup Truck		64.9	60.9
Tractor		73.9	69.9
Tractor		73.9	69.9
	Total	73.9	76.2

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/27/2021
Case Description: Toyota Arena Mixed Use Development

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Paving	Residential	80	60	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	160	0
Paver	No	50		77.2	160	0
Roller	No	20		80	160	0
Concrete Mixer Truck	No	40		78.8	160	0
Paver	No	50		77.2	160	0
Roller	No	20		80	160	0

Results

	Calculated (dBA)	
Equipment	*Lmax	Leq
Concrete Mixer Truck	68.7	64.7
Paver	67.1	64.1
Roller	69.9	62.9
Concrete Mixer Truck	68.7	64.7
Paver	67.1	64.1
Roller	69.9	62.9
Total	69.9	71.8

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/27/2021
Case Description: Toyota Arena Mixed Use Development

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Architectural Coating	Residential	80	60	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	160	0

Results

		Calculated (dBA)	
Equipment		*Lmax	Leq
Compressor (air)		67.6	63.6
	Total	67.6	63.6

*Calculated Lmax is the Loudest value.

VIBRATION IMPACTS FROM CONSTRUCTION AND OPERATIONS

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2957-2021-02
ACTIVITY:	Caisson Drilling	DATE:	27-May-21
LOCATION:	Nearest Structure at 50 Feet	ENGINEER:	D. Shivaiah

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.042 in/sec**

Equipment Type =	3	Caisson Drilling
PPV_{ref} =	0.089	Reference PPV at 25 ft.
D =	50.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV at 25 ft. (in/sec)
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

VIBRATION IMPACTS FROM CONSTRUCTION AND OPERATIONS

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2957-2021-02
ACTIVITY:	Large Bulldozer	DATE:	27-May-21
LOCATION:	Nearest Structure at 50 Feet	ENGINEER:	D. Shivaiah

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.042 in/sec**

Equipment Type =	2	Large Bulldozer
PPV_{ref} =	0.089	Reference PPV at 25 ft.
D =	50.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV at 25 ft. (in/sec)
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2957-2021-02
ACTIVITY:	Loaded Truck	DATE:	27-May-21
LOCATION:	Nearest Structure at 50 Feet	ENGINEER:	D. Shivaiah

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.035 in/sec**

Equipment Type =	4	Loaded Trucks
PPV_{ref} =	0.076	Reference PPV at 25 ft.
D =	50.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV at 25 ft. (in/sec)
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

VIBRATION IMPACTS FROM CONSTRUCTION AND OPERATIONS

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2957-2021-02
ACTIVITY:	Vibratory Roller	DATE:	27-May-21
LOCATION:	Nearest Structure at 50 Feet	ENGINEER:	D. Shivaiah

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.098 in/sec**

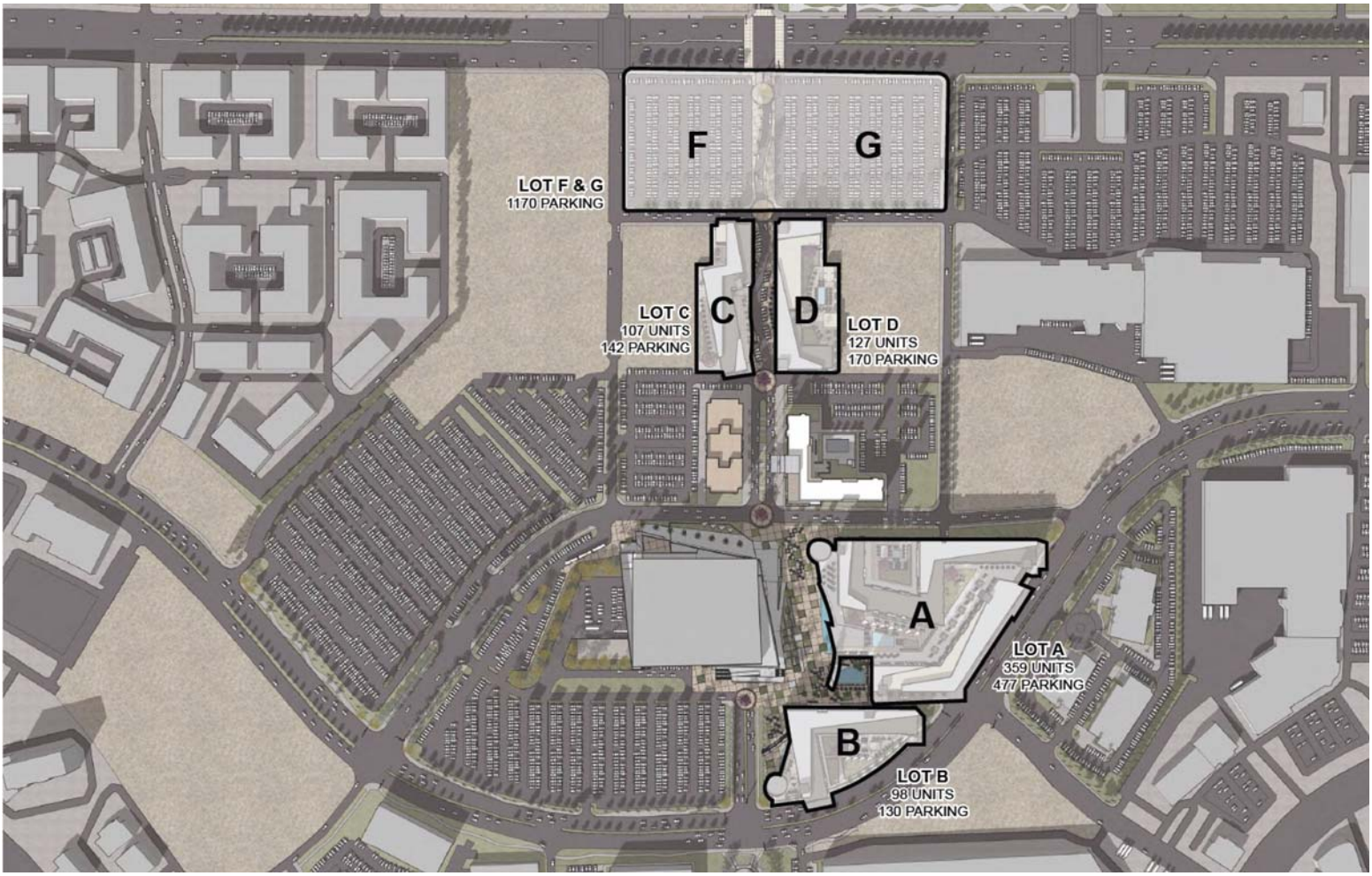
Equipment Type =	1	Vibratory Roller
PPV_{ref} =	0.210	Reference PPV at 25 ft.
D =	50.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV at 25 ft. (in/sec)
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

APPENDIX D
ENERGY STUDY

TOYOTA ARENA MIXED-USE DEVELOPMENT
ENERGY CONSERVATION ANALYSIS
City of Ontario



TOYOTA ARENA MIXED-USE DEVELOPMENT
ENERGY CONSERVATION ANALYSIS
City of Ontario, California

Prepared for:

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Darshan Shivaiah, M.S

June 4, 2021

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1.0 Introduction

1.1 Purpose of Report and Study Objectives

The purpose of this energy conservation analysis is to review the energy implications of the proposed Toyota Arena Mixed-Use Development (project) and provide recommendations to reduce wasteful, inefficient and unnecessary consumption of energy during construction and operation. This analysis has been prepared within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.).

CEQA Guidelines, Appendix F, Energy Conservation, describes the framework within which energy conservation should be analyzed. Conserving energy implies the wise and efficient use of energy through decreasing overall per capita energy consumption, decreasing reliance on fossil fuels (such as coal, natural gas and oil), and increasing reliance on renewable energy sources. This analysis considers energy impacts to include:

1. The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project including construction and operation.

2. The effects of the project on local and regional energy supplies and on requirements for additional capacity.

3. The effects of the project on peak and base period demands for electricity and other forms of energy.

4. The degree to which the project complies with existing energy standards.

5. The effects of the project on energy resources.

1.2 Site Location

The proposed project site is located adjacent to the Toyota Arena, north of Concourse Street and south of Fourth Street, in the City of Ontario.

The project site is located with Ontario Center Specific Plan and zoned for Urban Commercial within the Specific Plan. The City of Ontario General Plan land use map designates the project site as Mixed Use.

The project location map is provided in Exhibit A.

1.3 Project Description

The project consists of construction and operation of a mixed use town center development with residential and commercial/retail land use within four development lots.

The proposed project includes a total of 691 residential dwelling units, 71,200 square feet of commercial/retail uses and the demolition and relocation of approximately 1,170 surface parking spaces. The total project site area is approximately 18.73 acres.

The site plan used for this analysis, provided by the applicant, is illustrated in Exhibit B. Table 1 summarizes the land use assumptions used for this analysis.

Table 1
Land Use Summary

Lot	Dwelling Units	Retail (SF)[1]	Parking Spaces
A	359	25,256	477[2]
B	98	20,802	130[2]
C	107	11,047	142[2]
D	127	14,095	170[2]
E & F	--	--	1,170
Total	691	71,200	2,089

[1] S.F. – Square Feet
[2] Parking Structure

The site plan used in this analysis was provided by the applicant, and is illustrated in Exhibit B.

1.4 Utility Providers

The project will be served by the following utility providers, as shown in Table 2.

Table 2
Utility Providers

Utility	Provider
Electricity	Southern California Edison
Natural Gas	Southern California Gas Company
Water	Ontario Public Works & OMUC
Sewer	Ontario Public Works & OMUC
Telephone	Frontier Communications
Cable	Frontier Communications

1.5 Summary of CEQA Impacts

Table 3 provides a summary of the project's impact to Energy resources, per the impact criteria described in CEQA Guidelines, Appendix G.

Table 3
CEQA Energy Impact Criteria

Energy Impact Criteria	Potentially Significant	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?			X	
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?			X	

1.6 Project Design Features

The following project design features are considered standard building code requirements and best practices that will be included in the project design to will help reduce energy consumption. Design features are not typically considered mitigation under CEQA.

Construction Design Features

DF-1 Establish an electricity supply to the construction site and use electric powered equipment instead of diesel-powered equipment or generators, where feasible.

Operational Design Features

DF-2 Implement the GHG Reduction Measures from the Ontario County Climate Action Plan (CAP) Screening Tables to achieve at least 100 points, per the requirements for Mixed Use Projects.

DF-3 Comply with the mandatory requirements of California Building Standards Code Title 24 Part 6 (Energy Code) and Title 24 Part 11 (CAL Green).

DF-4 Implement water conservation strategies, including low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and limit the amount of turf/sod, per CAL Green and City of Ontario requirements.

DF-5 Implement zero waste strategies, recycling and composting programs for residential and non-residential uses.

DF-6 Encourage residents and landscape maintenance crews to use electric landscaping equipment, such as lawn mowers and leaf blowers, wherever feasible.

DF-7 No natural gas or wood burning fireplaces shall be installed in any residential dwelling.

DF-8 Implement trip reduction measures that reduce the number of auto-based trips and encourage the use of transit, bicycling, and walking. Such as;

1. Improve the walkability and design of the project by including pedestrian and bicycling connections within the project site and to adjacent off-site facilities (i.e. sidewalks, crosswalks, foot paths, protected bike lanes, multi-purpose trails, direct parcel-to-parcel connections, wayfinding signage, etc.).

2. Provide traffic calming measures (i.e. marked crosswalks, raised crosswalks, raised intersections, count-down signal timers, curb extensions, speed tables, median islands, tight corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, etc.)

3. Provide bicycle racks for the retail and commercial uses and secure bicycle parking areas for the office and residential uses.

DF-9 Provide electric vehicle charging stations per the requirements of CALGreen.

2.0 Regulatory Setting

Energy is controlled through various federal and state laws and regulations. This section provides a brief overview of key energy legislation and policies at the federal and state levels over the past 50 years.

2.1 Federal Regulations

Table 4
U.S. Energy Policy Legislative Acts

Date	Legislative Act and Description
1975	**Energy Policy and Conservation Act** Established the Strategic Petroleum Reserve and mandated vehicle fuel economy standards
1978	**National Energy Act** Established tax incentives and disincentives, alternative fuel programs, energy efficiency initiatives, and other regulatory and market-based initiatives in response to the oil crisis earlier in the decade. Comprised of 5 statutes: **Energy Tax Act** Created the Gas Guzzler tax for vehicles with mileage below specified levels and offered income tax credit for citizens using solar, wind, or geothermal energy sources at home **Natural Gas Policy Act** Set up wellhead pricing maximums, rules for allocating costs of high-cost gas to industrial consumers, and provided authority to high priority users in times of supply emergency; gave FERC jurisdiction over almost all natural gas production **National Energy Conservation Policy Act** Replaced Minimum Energy Performance Standards (MEPS) set forth in the EPCA of 1975, changed energy standards from voluntary to mandatory, Required federal agencies to do energy audits of their operations, Provided loans for families to purchase solar heating or cooling systems, and Established grants for schools, hospitals, local governments, and public housing authorities willing to use energy conservation measures **Power Plant and Industrial Fuel Use Act** Restricted construction of power plants fueled primarily by oil or natural gas and instead encouraged power plants fueled by coal, nuclear, and alternative fuels and restricted use of oil and natural gas in industrial boilers. Repealed in 1987 with the Natural Gas Utilization Act **Public Utility Regulatory Policies Act** Promoted use of renewable energy, encouraged cogeneration plants.
1980	**Energy Security Act** Title I: US Synthetic Fuels Corporation Act Established the Synthetic Fuels Corporation (which only existed until 1985) for the purpose of partnering with industry for the creation of a market for domestically-produced synthetic liquid fuels; moved research and development for synthetic fuels away from the Department of Energy and into this public-private partnership with the hopes of speeding up results. Title II: Biomass Energy and Alcohol Fuels Act Provided loan guarantees for small-scale biomass energy projects; established the Office of Alcohol Fuels, the Office of Energy from Municipal Waste.

Table 4
U.S. Energy Policy Legislative Acts

Date	Legislative Act and Description
	Title III: Energy Targets Required the submission of energy targets for net imports. Title IV: Renewable Initiatives Established incentives for the use of renewable energy resources Title V: Solar Energy and Energy Conservation Encouraged energy conservation and the use of solar energy, reducing dependence on foreign energy supplies. Title VI: Geothermal Energy Act Authorized loans from the Geothermal Resources Development Fund for exploration and determination of economic viability of a geothermal reservoir, cancels loan if reservoir is deemed unacceptable for development. Title VII: Acid Precipitation Program Established a task force to study the causes and risks of acid precipitation Title VIII: Strategic Petroleum Reserve Established that 500,000,000 barrels of crude oil must be in storage before any can be sold and calls for the reserve to increase its supply 100,000 barrels per day until the storage capacity is reached
1992	**Energy Policy Act** Amended the National Energy Conservation Policy Act of 1978. Created framework for wholesale electricity generation. Provided financial incentives to users/developers of clean-fuel vehicles; repealed alternative minimum tax for some producers. Intended to expand the use of natural gas.
2002	**Farm Security and Rural Investment Act (Farm Bill)** Included $405 million in mandatory funding over the following 5 years for the procurement of bio-based products, grants and loans for renewable energy and energy efficiency projects, research and development and the bioenergy program. Included, for reasons of national energy and security, rural economic development, and environmental sustainability in light of climate change impacts.
2005	**Energy Policy Act** Offers tax benefits to individuals who increase energy efficiency in existing homes, buy or lease hybrid/alternative vehicles, required all public utilities to offer net metering on request, increased required amounts of renewable fuel in gasoline sold in the US, and encourages more domestic energy production
2007	**Energy Independence and Security Act** Increased CAFE standards to 35 mpg (fleet-wide for passenger autos and light trucks) by 2020; instituted new conservation measures for federal fleet vehicles; authorized increased taxpayer-funded biofuel production (36 billion gallons by 2022 - 21 billion of which must be derived from non-cornstarch products). Revised standards for appliances and lighting; all federal buildings must use Energy Star lighting products; training for green jobs; loans for small business energy efficiency improvements.
2008	**Food, Conservation, and Energy Act (Farm Bill)** Includes provisions for loan guarantees for bio-refineries, payments to support expansion of advanced biofuels, expands the existing Rural Energy for America Program, provides grant monies for biofuel and bio-based product research and development
2009	**The American Recovery and Reinvestment Act of 2009**

Table 4
U.S. Energy Policy Legislative Acts

Date	Legislative Act and Description
	$800 billion economic stimulus package aimed at job creation and the promotion of investment and consumer spending; included $4.3 billion in tax credits to homeowners for energy efficiency improvements in 2009-2010, $300 million for reducing diesel engine emissions, $21.5 billion for energy infrastructure, $27.2 billion for energy efficiency and renewable energy research and investment, $2 billion in research for DOE, $600 million in research for NOAA
2015	**The Clean Power Plan** The first comprehensive plan to reduce carbon emissions from power plants by 32% in 2030, compared to 2005 levels. The plan was repealed under the Trump Administration. The Biden Administration has recently said it will not try to resurrect the plan, but will instead be proposing a new rule aimed at limiting GHG emissions from power plants.

[1] Source: Robinson, Brandi. Penn State University. https://www.e-education.psu.edu/geog432/node/116

2.2 State of California Regulations

California has a long-standing history of support for energy conservation and renewable energy.

Table 5 provides a summary of some of the key legislative acts, policies and regulations in the State of California for encouraging energy conservation and renewable energy.

Table 5
California Energy Policy Legislative Acts and Regulations

Date	Legislative Act and Description
1974	**Warren-Alquist Act** Established the California Energy Commission (CEC) as the state's primary energy policy and planning agency. Responsible for preparing State Energy Plan. CEC's goals are to reduce energy costs and environmental impacts of energy use, while ensuring a safe, resilient, and reliable supply of energy.
1978	**Title 24 of the California Code of Regulations** Establishes the Renewable Portfolio Standard (RPS) program, requiring 20% of retail sales from renewable energy by 2017.
2002	**Senate Bill 1078** Required 20% of retail sales from renewable energy by 2017.
2003	**Energy Action Plan I** Accelerated the 20% renewable deadline to 2010.
2005	**Energy Action Plan II** Recommended further goal of 33% renewable by 2020.
2006	**Senate Bill 107** Codified the accelerated 20% renewable by 2010 deadline into law.
2008	**Executive Order S-14-08** Signed by Gov. Schwarzenegger, requires 33% renewables by 2020.
2009	**Executive Order S-21-09** Directs the California Air Resources Board, under its AB 32 authority, to adopt regulations by July 31, 2010, consistent with the 33% renewable energy target established in Executive Order S-14-08.
2011	**Senate Bill X1-2** Signed by Gov. Edmund G. Brown, Jr., codifies 33% renewable by 2020 RPS
2015	**Senate Bill 350 – Clean Energy and Pollution Reduction Act of 2015** Signed by Gov. Edmund G. Brown, Jr. codifies 50% by 2030 RPS
2018	**Senate Bill 100** Signed by Gov. Edmund G. Brown, Jr. codifies 60% by 2030 & 100% by 2045 RPS

[1] Source: California Energy Commission. https://www.energy.ca.gov/renewables/index.html

3.0 Project Energy Consumption

3.1 Energy Consumption Methodology

The three (3) main types of energy expected to be consumed by the project include electricity, natural gas and petroleum products in the form of gasoline and diesel fuel. Energy usage for the proposed project is calculated based on the *CalEEMod* and *Toyota Arena Mixed Use Development Air Quality and Greenhouse Gas Analysis, prepared by RK Engineering Group, Inc., dated June 2021* (Air/GHG Study).

The California Emissions Estimator Model Version 2020.4.0 (CalEEMod) is used to calculate energy usage from project construction and operational activities.

The CalEEMod Annual Reports for the project are provided in Appendix A.

3.2 Electricity Consumption

The project will use electricity for many different operational activities including, but not limited to, building heating and cooling, lighting, appliances, electronics, mechanical equipment, electric vehicle charging, and parking lot lighting. Indirect electricity usage will also be required to supply, distribute, and treat water and wastewater. Electricity will be provided to the site by Southern California Edison.

Temporary electricity usage for construction activities may include lighting, electric equipment and mobile office uses, however, CalEEMod does not calculate electricity usage during construction. Electricity usage during construction is expected to be short-term and relatively minor compared to the operational demand, and therefore electricity usage during construction is not counted in this analysis.

Table 6 shows the project's estimated operational electricity consumption in kilowatt-hours per year (kWh/year) and millions of Btu per year.

Table 6
Project Electricity Consumption

Land Use/Activity	Electricity Consumption[1]	
	(kWhr/yr)[2]	(MBtu/yr)[2]
Apartments Mid Rise	2,736,370.00	9,336.49
Enclosed Parking with Elevator	1,999,740.00	6,823.11
Parking Lot	163,800.00	558.89
Regional Shopping Center	864,368.00	2,949.22
Water Supply and Treatment	1,066,561.70	3,639.11
Total	6,830,839.70	23,306.83

[1] Source: CalEEMod Defaults. Refer Appendix A

[2] kWhr/yr = Kilowatt Hours per Year
MBtu/yr = Million British Thermal Units per Year

3.3 Natural Gas Consumption

The project will use natural gas for such things as building heating and cooling, cooking, kitchen appliances, and gas water heaters. Natural gas is not expected to be used during construction in any significant quantities and is not included in the overall calculation of the project's natural gas consumption.

Table 7 shows the project's estimated operational natural gas consumption in millions of Btu per year.

Table 7
Project Natural Gas Consumption

Land Use/Activity	Natural Gas Consumption[1] (MBtu/yr)[2]
Apartments Mid Rise	9,938.08
Regional Shopping Center	156.64
Total	10,094.72

[1] Source: CalEEMod Defaults. Refer Appendix A

[2] MBtu/yr = Millions of British Thermal Units per Year

3.4 Petroleum Consumption

The project's energy consumption from petroleum products is primarily associated with transportation related activities. This includes gasoline and diesel fuel usage for auto and truck trips during construction and operation and off-road equipment usage during construction.

3.4.1 Petroleum Consumption - Construction

Construction of the project is estimated to last approximately 21 months and consist of demolition, site preparation, grading, building construction, paving, and architectural coating phases. Construction activities will consume energy in the form of motor vehicle fuel (gasoline and diesel) for off-road construction equipment and on-road vehicle trips. Vehicle trips include workers and vendors traveling to and from the job-site.

Table 8 shows the project's energy consumption for all off-road equipment during construction. For purposes of this analysis, all off-road equipment is assumed to run on diesel fuel. Table 9 shows the project's energy consumption from on-road vehicle trips during construction.

TABLE 8
Construction Off-Road Equipment Energy Consumption

Phase[1]	Phase Duration (Days)[1]	Equipment[1]	Amount[1]	Hours/ Day[1]	Horspower (HP)[1]	Load Factor[1]	HP-hrs[2]	Fuel Consumption Rate[3] (hp-hr/gal)	Diesel Fuel Consumption (gal.)	Diesel Fuel Consumption by Phase (gal.)	MBtu[4]
Demolition	20	Concrete/Industrial Saws	1	8	81	0.73	9,460.8	18.5	511.4	3,778.2	519.048
		Excavators	3	8	158	0.38	28,819.2		1,557.8		
		Rubber Tired Dozers	2	8	247	0.40	31,616.0		1,709.0		
Site Preparation	10	Rubber Tired Dozers	3	8	247	0.40	23,712.0		1,281.7	1,902.5	261.371
		Tractors/Loaders/Backhoes	4	8	97	0.37	11,484.8		620.8		
Grading	30	Excavators	2	8	158	0.38	28,819.2		1,557.8	9,336.0	1,282.589
		Graders	1	8	187	0.41	18,400.8		994.6		
		Rubber Tired Dozers	1	8	247	0.40	23,712.0		1,281.7		
		Scrapers	2	8	367	0.48	84,556.8		4,570.6		
		Tractors/Loaders/Backhoes	2	8	97	0.37	17,227.2		931.2		
Building Construction	300	Cranes	1	7	231	0.29	140,679.0		7,604.3	37,503.2	5,152.233
		Forklifts	3	8	89	0.20	128,160.0		6,927.6		
		Generator Sets	1	8	84	0.74	149,184.0		8,064.0		
		Tractors/Loaders/Backhoes	3	7	97	0.37	226,107.0		12,222.0		
		Welders	1	8	46	0.45	49,680.0		2,685.4		
Paving	20	Pavers	1	6	130	0.42	6,552.0		354.2	1,124.8	154.520
		Paving Equipment	1	8	132	0.36	7,603.2		411.0		
		Rollers	1	7	132	0.36	6,652.8		359.6		
Architectural Coating	75	Air Compressors	1	6	78	0.48	16,848.0		910.7	910.7	125.113
								Total Energy Requirements		**54,555.4**	**7,494.875**

[1] Source: Appendix A Annual Results Sheet. (CalEEMod v.2020.4.0)

[2] HP-hrs = Horsepower Hours.

[3] Source: Carl Moyer Program Guidelines. 2017 Revisions. Table D-21. https://www.arb.ca.gov/msprog/moyer/guidelines/current.htm

[4] Mbtu = Millions of Btu; assuming 1 gallon of diesel fuel = 137,381 Btu.

Table 9
Construction On-Road Trips Energy Consumption

Construction Phase[1]	Phase Duration (Days)[1]	Trips /Day[1]	Trip Length[1]	Phase VMT	Vehicle Class[1]	Vehicle Mix[1]	Average Fuel Economy (MPG)[2]	Gasoline			Diesel			Total MBtu[3]
								Fuel Split[2]	Fuel Consumption by Veh. Class (gal.)	Fuel Consumption by Phase (gal.)	Fuel Split[2]	Fuel Consumption by Veh. Class (gal.)	Fuel Consumption by Phase	
Worker Trips														
Demolition	20	15	14.7	4,410	LDA	0.50	32.59	0.9938	67.24		0.0062	0.42		
					LDT1	0.25	27.46	0.9996	40.13	150.21	0.0004	0.02	0.66	18.18
					LDT2	0.25	25.60	0.9947	42.84		0.0053	0.23		
Site Prerparation	10	18	14.7	2,646	LDA	0.50	32.59	0.9938	40.34		0.0062	0.25		
					LDT1	0.25	27.46	0.9996	24.08	90.13	0.0004	0.01	0.40	10.91
					LDT2	0.25	25.60	0.9947	25.70		0.0053	0.14		
Grading	30	20	14.7	8,820	LDA	0.50	32.59	0.9938	134.48		0.0062	0.84		
					LDT1	0.25	27.46	0.9996	80.27	300.42	0.0004	0.03	1.33	36.36
					LDT2	0.25	25.60	0.9947	85.68		0.0053	0.46		
Building Construction	300	871	14.7	3,841,110	LDA	0.50	32.59	0.9938	58,565.44		0.0062	365.37		
					LDT1	0.25	27.46	0.9996	34,956.06	130,833.53	0.0004	13.99	578.17	15,835.58
					LDT2	0.25	25.60	0.9947	37,312.03		0.0053	198.81		
Paving	20	15	14.7	4,410	LDA	0.50	32.59	0.9938	67.24		0.0062	0.42		
					LDT1	0.25	27.46	0.9996	40.13	150.21	0.0004	0.02	0.66	18.18
					LDT2	0.25	25.60	0.9947	42.84		0.0053	0.23		
Architectural Coating	75	174	14.7	191,835	LDA	0.50	32.59	0.9938	2,924.91		0.0062	18.25		
					LDT1	0.25	27.46	0.9996	1,745.80	6,534.17	0.0004	0.70	28.88	790.87
					LDT2	0.25	25.60	0.9947	1,863.46		0.0053	9.93		
Sub-Total Worker Trips Energy Consumption									Gasoline (gal.)	138,058.66		Diesel (gal.)	610.10	16,710.08
Vendor Trips														
Building Construction	300	222	6.9	459,540	MHDT	0.50	9.58	0.2679	6,425.41	6,458.51	0.7321	17,558.94	50,633.90	7,733.93
					HHDT	0.50	6.94	0.0010	33.11		0.9990	33,074.96		
Hauling Trips														
Demolition	20	1,483	20.0	593,200	HHDT	1.00	6.94	0.0010	85.48	85.48	0.9990	85,390.03	85,390.03	11,741.26
Total On-Road Construction Trips Energy Consumption									**Gasoline (gal.)**	**144,602.65**		**Diesel (gal.)**	**136,634.02**	**36,185.27**

1 Source: Appendix A Annual Results Sheet. (CalEEMod v.2020.4.0)
[2] Source: EMFAC2017 Web Database. https://www.arb.ca.gov/emfac/2017/. (See Appendix B for more details.)
[3] Mbtu = Millions of Btu; assuming 1 gallon of gasoline fuel = 120,429 Btu and 1 gallon of diesel fuel = 137,381 Btu

3.4.2 Petroleum Consumption - Operation

The project is expected to consume energy from auto and truck trips generated by the proposed land uses, as described in the Toyota Arena Mixed Use Development Traffic Impact Study Scoping Agreement, by RK, May 2021 and the Toyota Arena Mixed Use Development Air Quality and Greenhouse Gas Impact Study, prepared by RK Engineering Group, Inc., dated June 2021. Operational vehicle trips are associated with workers, customers and vendors/non-workers (i.e., delivery, service, maintenance vehicles, etc.) traveling to and from the site.

Table 10 shows the project's petroleum energy consumption for all operational trips generated by the project on an annual basis.

Table 10
Operational Trips Energy Consumption - Annual

Vehicle Class	Vehicle Mix	Average Fuel Economy (MPG)	Mitigated Annual VMT	Gasoline		Diesel		MBtu
				Fuel Split	Fuel Consumption (gal.)	Fuel Split	Fuel Consumption (gal.)	
LDA	55.05%	32.59		0.9938	171,606.07	0.0062	1,070.60	20,813.43
LDT1	5.72%	27.46		0.9996	21,269.87	0.0004	8.51	2,562.68
LDT2	17.64%	25.60		0.9947	70,077.78	0.0053	373.39	8,490.69
MDV	14.23%	20.81		0.9815	68,604.36	0.0185	1,293.10	8,439.60
LHD1	2.76%	13.81		0.7188	14,708.48	0.2812	5,754.07	2,561.83
LHD2	0.34%	14.18		0.5328	1,294.18	0.4672	1,134.84	311.76
MHD	0.53%	9.58	10,221,754	0.2679	1,524.84	0.7321	4,166.97	756.10
HHD	0.81%	6.94		0.0010	11.92	0.9990	11,909.43	1,637.56
OBUS	0.03%	5.11		1.0000	523.61	0.0000	0.00	63.06
UBUS	0.01%	5.18		0.9866	231.56	0.0134	3.15	28.32
MCY	2.59%	36.38		1.0000	7,278.11	0.0000	0.00	876.50
SBUS	0.04%	8.15		0.3076	172.34	0.6924	387.94	74.05
MH	0.24%	6.07		0.8447	3,377.72	0.1553	621.00	492.09
Total Operational Trips Energy Usage				Gasoline Consumption (gal.)	360,680.84	Diesel Consumption (gal.)	26,723.00	47,107.67

[1] Source: Toyota Arena Mixed Use Development Air Quality and Greenhouse Gas Analysis, by RK Engineering Group, Inc. (CalEEMod .2020.4.0)
[2] Source: EMFAC2017 Web Database. https://www.arb.ca.gov/emfac/2017/. (See Appendix B for more details.)
[3] MBtu/yr = Millions of Btu per year; assuming 1 gallon of gasoline fuel = 120,429 Btu and 1 gallon of diesel fuel = 137,381 Btu

3.5 Summary of Project Energy Consumption

Table 11 provides a summary of the project's annual operational energy consumption.

Table 11
Annual Energy Consumption

Activity	Energy Consumption (MBtu/yr)[1]
Total Annual Operational Energy Consumption	**80,509.21**
Electricity	23,306.83
Natural Gas	10,094.72
Petroleum	47,107.67

[1] MBtu/yr = Millions of Btu per year. Operational activities only.

4.0 Energy Impacts

4.1 Energy Impact Criteria

This analysis has been prepared within the context of the CEQA Guidelines, Appendix F, Energy Conservation, and Appendix G, Environmental Checklist Form. According to CEQA, the goal of conserving energy implies the wise and efficient use of energy through decreasing overall per capita energy consumption, decreasing reliance on fossil fuels (such as coal, natural gas and oil), and increasing reliance on renewable energy sources.

A significant environmental impact would result if the project would;

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation, or;

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

4.2 Energy Impact – 1

Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

The project's impact is considered less than significant with the inclusion of the mandatory requirements of California's Building Energy Efficiency Standards (Title 24, Part 6) and Green Building Standards (CALGreen, Title 24, Part 11). California's building energy efficiency standards are some of the strictest in the nation and the project's compliance with California's building code will ensure that wasteful, inefficient or unnecessary consumption of energy is minimized. The building standards code is designed to reduce the amount of energy needed to heat or cool a building, reduce energy usage for lighting and appliances.

The following recommended design features are provided to reduce wasteful, inefficient and unnecessary consumption of energy. Design features are consistent with the recommended design features provided with Air/GHG study.

Construction Design Features

DF-1 Establish an electricity supply to the construction site and use electric powered equipment instead of diesel-powered equipment or generators, where feasible.

Operational Design Features

DF-2 Implement the GHG Reduction Measures from the Ontario County Climate Action Plan (CAP) Screening Tables to achieve at least 100 points, per the requirements for Mixed Use Projects.

DF-3 Comply with the mandatory requirements of California Building Standards Code Title 24 Part 6 (Energy Code) and Title 24 Part 11 (CAL Green).

DF-4 Implement water conservation strategies, including low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and limit the amount of turf/sod, per CAL Green and City of Ontario requirements.

DF-5 Implement zero waste strategies, recycling and composting programs for residential and non-residential uses.

DF-6 Encourage residents and landscape maintenance crews to use electric landscaping equipment, such as lawn mowers and leaf blowers, wherever feasible.

DF-7 No natural gas or wood burning fireplaces shall be installed in any residential dwelling.

DF-8 Implement trip reduction measures that reduce the number of auto-based trips and encourage the use of transit, bicycling, and walking. Such as;

1. Improve the walkability and design of the project by including pedestrian and bicycling connections within the project site and to adjacent off-site facilities (i.e. sidewalks, crosswalks, foot paths, protected bike lanes, multi-purpose trails, direct parcel-to-parcel connections, wayfinding signage, etc.).

2. Provide traffic calming measures (i.e. marked crosswalks, raised crosswalks, raised intersections, count-down signal timers, curb extensions, speed tables, median islands, tight corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, etc.)

3. Provide bicycle racks for the retail and commercial uses and secure bicycle parking areas for the office and residential uses.

DF-9 Provide electric vehicle charging stations per the requirements of CALGreen.

4.3 Energy Impact – 2

Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

The project's impact is considered less than significant as the project will purchase electricity through Southern California Edison which is subject to the requirements of California Senate Bill 100 (SB 100). SB 100 is the most stringent and current energy legislation in California; requiring that renewable energy resources and zero-carbon resources supply 100% of retail sales of electricity to California end-use customers and 100% of electricity procured to serve all state agencies by December 31, 2045.[1]

The project will further comply with the mandatory requirements of California's Green Building and Building Energy Efficiency standards that promote renewable energy and energy efficiency.

[1] SB-100 California Renewables Portfolio Standard Program. http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB100

Exhibits

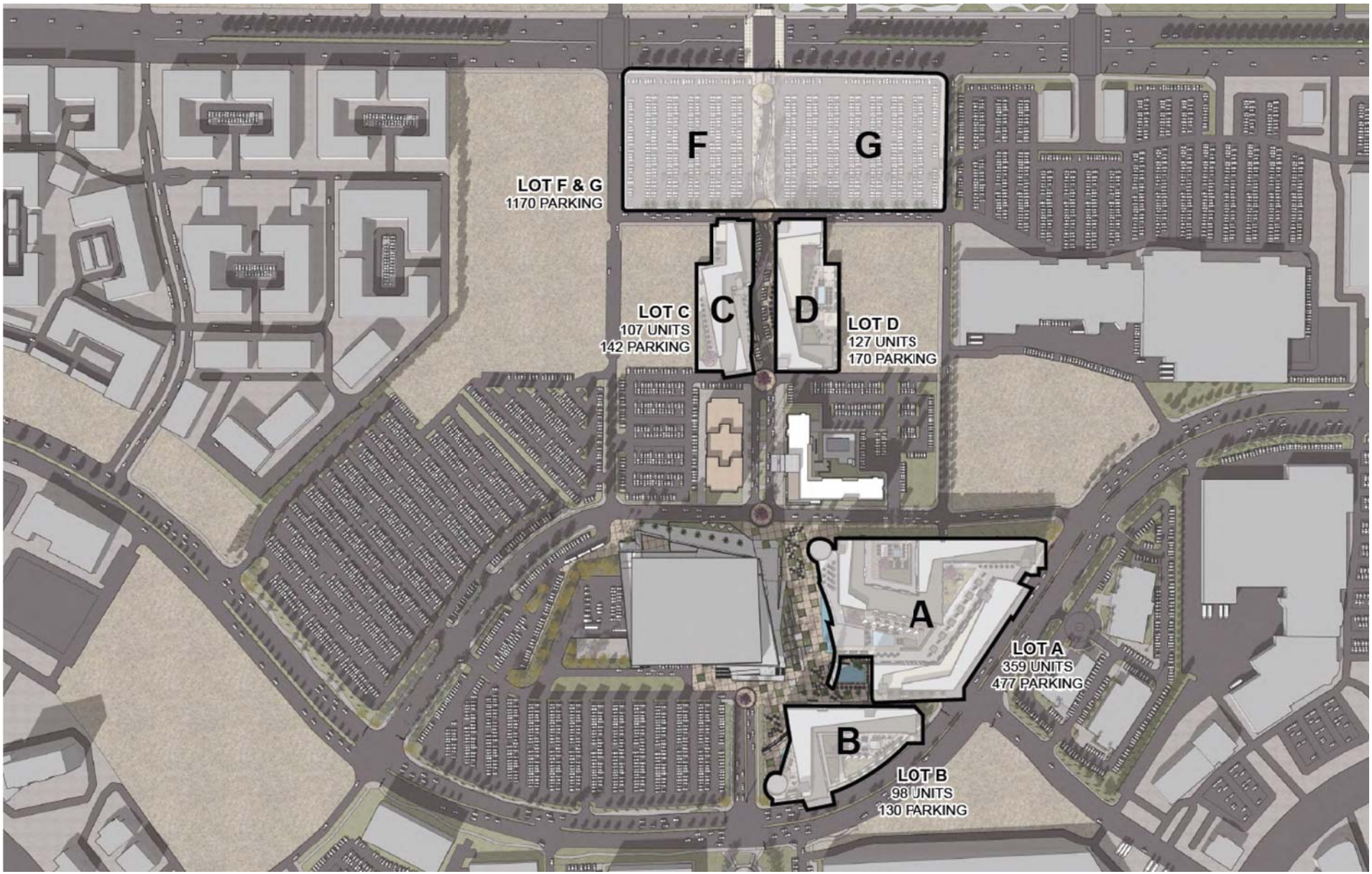
Exhibit A

Location Map

N

Exhibit B

Site Plan



Appendices

Appendix A

CalEEMod Annual Emissions Output

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Toyota Arena Mixed Use Development

San Bernardino-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Mid Rise	691.00	Dwelling Unit	11.47	691,000.00	1976
Enclosed Parking with Elevator	919.00	Space	0.00	367,600.00	0
Parking Lot	1,170.00	Space	7.26	468,000.00	0
Regional Shopping Center	71.20	1000sqft	0.00	71,200.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	32
Climate Zone	10			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	531.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The proposed project consists of a mixed-use town center development with 691 multifamily DU and 71,200 square feet of commercial/retail land uses on approximately 18.73 acres.

Construction Phase - The project's architectural coating phase will be extended to 75 days.

Demolition - The project is proposing to demolish approximetely 326,026 square feet of surface asphalt parking lot.

Vehicle Trips - The trip generation rates have been updated to reflect Toyota Arena TIA Scoping Agreement, by RK, May 25, 2021 and Traffic Impact Study and SANBAG VMT Model.

Fleet Mix - Operational fleet mix adjusted to equal 2% trucks with GVWR > 10,000 lbs.

Woodstoves - SCAQMD Rule 445 restricts wood burning hearths/fireplaces from being installed in new development.

Construction Off-road Equipment Mitigation - Project will be required to comply with SCAQMD Rule 403 regarding fugitive dust control.

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

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tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	20.00	75.00
tblConstructionPhase	PhaseEndDate	4/13/2023	6/29/2023
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberWood	34.55	0.00
tblFleetMix	HHD	0.00	8.0940e-003
tblFleetMix	HHD	0.00	0.02
tblFleetMix	HHD	0.00	0.02
tblFleetMix	HHD	0.00	8.0940e-003
tblFleetMix	LDA	0.00	0.55
tblFleetMix	LDA	0.00	0.54
tblFleetMix	LDA	0.00	0.54
tblFleetMix	LDA	0.00	0.55
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT2	0.00	0.18
tblFleetMix	LDT2	0.00	0.17
tblFleetMix	LDT2	0.00	0.17
tblFleetMix	LDT2	0.00	0.18
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD2	0.00	3.3700e-003
tblFleetMix	LHD2	0.00	7.1960e-003

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tblFleetMix	LHD2	0.00	7.1960e-003
tblFleetMix	LHD2	0.00	3.3700e-003
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MH	0.00	2.3750e-003
tblFleetMix	MH	0.00	5.0710e-003
tblFleetMix	MH	0.00	5.0710e-003
tblFleetMix	MH	0.00	2.3750e-003
tblFleetMix	MHD	0.00	5.3340e-003
tblFleetMix	MHD	0.00	0.01
tblFleetMix	MHD	0.00	0.01
tblFleetMix	MHD	0.00	5.3340e-003
tblFleetMix	OBUS	0.00	2.6200e-004
tblFleetMix	OBUS	0.00	5.5900e-004
tblFleetMix	OBUS	0.00	5.5900e-004
tblFleetMix	OBUS	0.00	2.6200e-004
tblFleetMix	SBUS	0.00	4.4700e-004
tblFleetMix	SBUS	0.00	9.5400e-004
tblFleetMix	SBUS	0.00	9.5400e-004
tblFleetMix	SBUS	0.00	4.4700e-004
tblFleetMix	UBUS	0.00	1.1900e-004
tblFleetMix	UBUS	0.00	2.5400e-004
tblFleetMix	UBUS	0.00	2.5400e-004

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblFleetMix	UBUS	0.00	1.1900e-004
tblLandUse	LotAcreage	18.18	11.47
tblLandUse	LotAcreage	8.27	0.00
tblLandUse	LotAcreage	10.53	7.26
tblLandUse	LotAcreage	1.63	0.00
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	HO_TL	8.70	4.37
tblVehicleTrips	HO_TTP	40.60	0.00
tblVehicleTrips	HS_TL	5.90	4.37
tblVehicleTrips	HS_TTP	19.20	0.00
tblVehicleTrips	HW_TL	14.70	4.37
tblVehicleTrips	HW_TTP	40.20	100.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	ST_TR	4.91	5.17
tblVehicleTrips	ST_TR	46.12	36.38
tblVehicleTrips	SU_TR	4.09	5.17
tblVehicleTrips	WD_TR	5.44	5.17
tblVehicleTrips	WD_TR	37.75	29.77
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.1379	1.4343	0.9987	2.4700e-003	0.4484	0.0609	0.5093	0.1435	0.0564	0.1999	0.0000	224.5415	224.5415	0.0463	9.7200e-003	228.5934
2022	0.6978	3.6944	6.6165	0.0197	1.4235	0.1269	1.5504	0.3823	0.1195	0.5017	0.0000	1,821.1850	1,821.1850	0.1147	0.1062	1,855.7077
2023	2.7410	0.5904	1.2453	3.4500e-003	0.2593	0.0218	0.2812	0.0694	0.0206	0.0900	0.0000	318.7457	318.7457	0.0230	0.0147	323.7039
Maximum	**2.7410**	**3.6944**	**6.6165**	**0.0197**	**1.4235**	**0.1269**	**1.5504**	**0.3823**	**0.1195**	**0.5017**	**0.0000**	**1,821.1850**	**1,821.1850**	**0.1147**	**0.1062**	**1,855.7077**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0376	0.2555	1.0489	2.4700e-003	0.2033	5.1200e-003	0.2085	0.0635	5.0000e-003	0.0685	0.0000	224.5413	224.5413	0.0463	9.7200e-003	228.5933
2022	0.5186	1.9549	6.7591	0.0197	1.4235	0.0270	1.4506	0.3823	0.0258	0.4081	0.0000	1,821.1847	1,821.1847	0.1147	0.1062	1,855.7073
2023	2.7062	0.2501	1.2939	3.4500e-003	0.2593	3.4000e-003	0.2627	0.0694	3.2600e-003	0.0727	0.0000	318.7457	318.7457	0.0230	0.0147	323.7038
Maximum	**2.7062**	**1.9549**	**6.7591**	**0.0197**	**1.4235**	**0.0270**	**1.4506**	**0.3823**	**0.0258**	**0.4081**	**0.0000**	**1,821.1847**	**1,821.1847**	**0.1147**	**0.1062**	**1,855.7073**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**8.79**	**56.98**	**-2.72**	**0.00**	**11.50**	**83.06**	**17.91**	**13.45**	**82.65**	**30.62**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**10-1-2021**	**12-31-2021**	1.5660	0.2892
2	**1-1-2022**	**3-31-2022**	1.0897	0.6152
3	**4-1-2022**	**6-30-2022**	1.0873	0.6076
4	**7-1-2022**	**9-30-2022**	1.0992	0.6143
5	**10-1-2022**	**12-31-2022**	1.1139	0.6289
6	**1-1-2023**	**3-31-2023**	1.0104	0.6811
7	**4-1-2023**	**6-30-2023**	2.3186	2.2757
		Highest	2.3186	2.2757

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.3006	0.2042	7.2070	1.1600e-003		0.0494	0.0494		0.0494	0.0494	0.0000	152.7384	152.7384	0.0140	2.5900e-003	153.8599
Energy	0.0544	0.4656	0.2013	2.9700e-003		0.0376	0.0376		0.0376	0.0376	0.0000	1,929.6251	1,929.6251	0.0966	0.0203	1,938.1000
Mobile	2.4002	2.4859	20.0954	0.0365	3.8326	0.0279	3.8605	1.0209	0.0260	1.0469	0.0000	3,401.2398	3,401.2398	0.2559	0.1743	3,459.5668
Waste						0.0000	0.0000		0.0000	0.0000	79.6983	0.0000	79.6983	4.7100	0.0000	197.4492
Water						0.0000	0.0000		0.0000	0.0000	15.9564	242.7848	258.7412	1.6539	0.0405	312.1654
Total	**5.7552**	**3.1557**	**27.5037**	**0.0406**	**3.8326**	**0.1149**	**3.9475**	**1.0209**	**0.1130**	**1.1339**	**95.6547**	**5,726.3881**	**5,822.0429**	**6.7306**	**0.2377**	**6,061.1414**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.3006	0.2042	7.2070	1.1600e-003		0.0494	0.0494		0.0494	0.0494	0.0000	152.7384	152.7384	0.0140	2.5900e-003	153.8599
Energy	0.0544	0.4656	0.2013	2.9700e-003		0.0376	0.0376		0.0376	0.0376	0.0000	1,929.6251	1,929.6251	0.0966	0.0203	1,938.1000
Mobile	2.4002	2.4859	20.0954	0.0365	3.8326	0.0279	3.8605	1.0209	0.0260	1.0469	0.0000	3,401.2398	3,401.2398	0.2559	0.1743	3,459.5668
Waste						0.0000	0.0000		0.0000	0.0000	79.6983	0.0000	79.6983	4.7100	0.0000	197.4492
Water						0.0000	0.0000		0.0000	0.0000	15.9564	242.7848	258.7412	1.6539	0.0405	312.1654
Total	**5.7552**	**3.1557**	**27.5037**	**0.0406**	**3.8326**	**0.1149**	**3.9475**	**1.0209**	**0.1130**	**1.1339**	**95.6547**	**5,726.3881**	**5,822.0429**	**6.7306**	**0.2377**	**6,061.1414**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	10/1/2021	10/28/2021	5	20	
2	Site Preparation	Site Preparation	10/29/2021	11/11/2021	5	10	
3	Grading	Grading	11/12/2021	12/23/2021	5	30	

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4	Building Construction	Building Construction	12/24/2021	2/16/2023	5	300	
5	Paving	Paving	2/17/2023	3/16/2023	5	20	
6	Architectural Coating	Architectural Coating	3/17/2023	6/29/2023	5	75	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 90

Acres of Paving: 7.26

Residential Indoor: 1,399,275; Residential Outdoor: 466,425; Non-Residential Indoor: 106,800; Non-Residential Outdoor: 35,600; Striped Parking Area: 50,136 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	7.00	231	0.29
Demolition	Excavators	3	8.00	158	0.38
Grading	Excavators	2	8.00	158	0.38
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37

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Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	1,483.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	871.00	222.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	174.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

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3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1605	0.0000	0.1605	0.0243	0.0000	0.0243	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0317	0.3144	0.2157	3.9000e-004		0.0155	0.0155		0.0144	0.0144	0.0000	34.0008	34.0008	9.5700e-003	0.0000	34.2400
Total	**0.0317**	**0.3144**	**0.2157**	**3.9000e-004**	**0.1605**	**0.0155**	**0.1760**	**0.0243**	**0.0144**	**0.0387**	**0.0000**	**34.0008**	**34.0008**	**9.5700e-003**	**0.0000**	**34.2400**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.7800e-003	0.1221	0.0296	4.5000e-004	0.0128	1.7400e-003	0.0145	3.5100e-003	1.6600e-003	5.1700e-003	0.0000	44.2265	44.2265	1.9200e-003	7.0100e-003	46.3629
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.1000e-004	5.1000e-004	5.8300e-003	1.0000e-005	1.6400e-003	1.0000e-005	1.6500e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.3559	1.3559	4.0000e-005	4.0000e-005	1.3693
Total	**4.3900e-003**	**0.1226**	**0.0354**	**4.6000e-004**	**0.0144**	**1.7500e-003**	**0.0162**	**3.9500e-003**	**1.6700e-003**	**5.6200e-003**	**0.0000**	**45.5824**	**45.5824**	**1.9600e-003**	**7.0500e-003**	**47.7322**

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3.2 Demolition - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0614	0.0000	0.0614	9.2900e-003	0.0000	9.2900e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.6200e-003	0.0200	0.2328	3.9000e-004		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	34.0007	34.0007	9.5700e-003	0.0000	34.2400
Total	**4.6200e-003**	**0.0200**	**0.2328**	**3.9000e-004**	**0.0614**	**6.2000e-004**	**0.0620**	**9.2900e-003**	**6.2000e-004**	**9.9100e-003**	**0.0000**	**34.0007**	**34.0007**	**9.5700e-003**	**0.0000**	**34.2400**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.7800e-003	0.1221	0.0296	4.5000e-004	0.0128	1.7400e-003	0.0145	3.5100e-003	1.6600e-003	5.1700e-003	0.0000	44.2265	44.2265	1.9200e-003	7.0100e-003	46.3629
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.1000e-004	5.1000e-004	5.8300e-003	1.0000e-005	1.6400e-003	1.0000e-005	1.6500e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.3559	1.3559	4.0000e-005	4.0000e-005	1.3693
Total	**4.3900e-003**	**0.1226**	**0.0354**	**4.6000e-004**	**0.0144**	**1.7500e-003**	**0.0162**	**3.9500e-003**	**1.6700e-003**	**5.6200e-003**	**0.0000**	**45.5824**	**45.5824**	**1.9600e-003**	**7.0500e-003**	**47.7322**

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3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0983	0.0000	0.0983	0.0505	0.0000	0.0505	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0194	0.2025	0.1058	1.9000e-004		0.0102	0.0102		9.4000e-003	9.4000e-003	0.0000	16.7179	16.7179	5.4100e-003	0.0000	16.8530
Total	**0.0194**	**0.2025**	**0.1058**	**1.9000e-004**	**0.0983**	**0.0102**	**0.1085**	**0.0505**	**9.4000e-003**	**0.0599**	**0.0000**	**16.7179**	**16.7179**	**5.4100e-003**	**0.0000**	**16.8530**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7000e-004	3.0000e-004	3.5000e-003	1.0000e-005	9.9000e-004	1.0000e-005	9.9000e-004	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.8136	0.8136	3.0000e-005	2.0000e-005	0.8216
Total	**3.7000e-004**	**3.0000e-004**	**3.5000e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**9.9000e-004**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.8136**	**0.8136**	**3.0000e-005**	**2.0000e-005**	**0.8216**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Site Preparation - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0376	0.0000	0.0376	0.0193	0.0000	0.0193	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3300e-003	0.0101	0.1043	1.9000e-004		3.1000e-004	3.1000e-004		3.1000e-004	3.1000e-004	0.0000	16.7178	16.7178	5.4100e-003	0.0000	16.8530
Total	**2.3300e-003**	**0.0101**	**0.1043**	**1.9000e-004**	**0.0376**	**3.1000e-004**	**0.0379**	**0.0193**	**3.1000e-004**	**0.0196**	**0.0000**	**16.7178**	**16.7178**	**5.4100e-003**	**0.0000**	**16.8530**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7000e-004	3.0000e-004	3.5000e-003	1.0000e-005	9.9000e-004	1.0000e-005	9.9000e-004	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.8136	0.8136	3.0000e-005	2.0000e-005	0.8216
Total	**3.7000e-004**	**3.0000e-004**	**3.5000e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**9.9000e-004**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.8136**	**0.8136**	**3.0000e-005**	**2.0000e-005**	**0.8216**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1381	0.0000	0.1381	0.0548	0.0000	0.0548	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0629	0.6960	0.4632	9.3000e-004		0.0298	0.0298		0.0274	0.0274	0.0000	81.7425	81.7425	0.0264	0.0000	82.4034
Total	**0.0629**	**0.6960**	**0.4632**	**9.3000e-004**	**0.1381**	**0.0298**	**0.1678**	**0.0548**	**0.0274**	**0.0822**	**0.0000**	**81.7425**	**81.7425**	**0.0264**	**0.0000**	**82.4034**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2300e-003	1.0100e-003	0.0117	3.0000e-005	3.2900e-003	2.0000e-005	3.3100e-003	8.7000e-004	2.0000e-005	8.9000e-004	0.0000	2.7118	2.7118	8.0000e-005	8.0000e-005	2.7386
Total	**1.2300e-003**	**1.0100e-003**	**0.0117**	**3.0000e-005**	**3.2900e-003**	**2.0000e-005**	**3.3100e-003**	**8.7000e-004**	**2.0000e-005**	**8.9000e-004**	**0.0000**	**2.7118**	**2.7118**	**8.0000e-005**	**8.0000e-005**	**2.7386**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Grading - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0528	0.0000	0.0528	0.0210	0.0000	0.0210	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0114	0.0495	0.4950	9.3000e-004		1.5200e-003	1.5200e-003		1.5200e-003	1.5200e-003	0.0000	81.7424	81.7424	0.0264	0.0000	82.4033
Total	**0.0114**	**0.0495**	**0.4950**	**9.3000e-004**	**0.0528**	**1.5200e-003**	**0.0543**	**0.0210**	**1.5200e-003**	**0.0225**	**0.0000**	**81.7424**	**81.7424**	**0.0264**	**0.0000**	**82.4033**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2300e-003	1.0100e-003	0.0117	3.0000e-005	3.2900e-003	2.0000e-005	3.3100e-003	8.7000e-004	2.0000e-005	8.9000e-004	0.0000	2.7118	2.7118	8.0000e-005	8.0000e-005	2.7386
Total	**1.2300e-003**	**1.0100e-003**	**0.0117**	**3.0000e-005**	**3.2900e-003**	**2.0000e-005**	**3.3100e-003**	**8.7000e-004**	**2.0000e-005**	**8.9000e-004**	**0.0000**	**2.7118**	**2.7118**	**8.0000e-005**	**8.0000e-005**	**2.7386**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.7000e-003	0.0523	0.0497	8.0000e-005		2.8800e-003	2.8800e-003		2.7000e-003	2.7000e-003	0.0000	6.9491	6.9491	1.6800e-003	0.0000	6.9910
Total	**5.7000e-003**	**0.0523**	**0.0497**	**8.0000e-005**		**2.8800e-003**	**2.8800e-003**		**2.7000e-003**	**2.7000e-003**	**0.0000**	**6.9491**	**6.9491**	**1.6800e-003**	**0.0000**	**6.9910**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.5700e-003	0.0364	0.0122	1.3000e-004	4.2000e-003	6.1000e-004	4.8100e-003	1.2100e-003	5.9000e-004	1.8000e-003	0.0000	12.4033	12.4033	3.5000e-004	1.8400e-003	12.9601
Worker	0.0107	8.8300e-003	0.1016	2.6000e-004	0.0287	1.6000e-004	0.0288	7.6100e-003	1.5000e-004	7.7600e-003	0.0000	23.6201	23.6201	7.3000e-004	7.2000e-004	23.8534
Total	**0.0123**	**0.0453**	**0.1138**	**3.9000e-004**	**0.0329**	**7.7000e-004**	**0.0336**	**8.8200e-003**	**7.4000e-004**	**9.5600e-003**	**0.0000**	**36.0234**	**36.0234**	**1.0800e-003**	**2.5600e-003**	**36.8135**

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3.5 Building Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.8000e-004	6.7000e-003	0.0524	8.0000e-005		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004	0.0000	6.9491	6.9491	1.6800e-003	0.0000	6.9910
Total	**9.8000e-004**	**6.7000e-003**	**0.0524**	**8.0000e-005**		**1.2000e-004**	**1.2000e-004**		**1.2000e-004**	**1.2000e-004**	**0.0000**	**6.9491**	**6.9491**	**1.6800e-003**	**0.0000**	**6.9910**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.5700e-003	0.0364	0.0122	1.3000e-004	4.2000e-003	6.1000e-004	4.8100e-003	1.2100e-003	5.9000e-004	1.8000e-003	0.0000	12.4033	12.4033	3.5000e-004	1.8400e-003	12.9601
Worker	0.0107	8.8300e-003	0.1016	2.6000e-004	0.0287	1.6000e-004	0.0288	7.6100e-003	1.5000e-004	7.7600e-003	0.0000	23.6201	23.6201	7.3000e-004	7.2000e-004	23.8534
Total	**0.0123**	**0.0453**	**0.1138**	**3.9000e-004**	**0.0329**	**7.7000e-004**	**0.0336**	**8.8200e-003**	**7.4000e-004**	**9.5600e-003**	**0.0000**	**36.0234**	**36.0234**	**1.0800e-003**	**2.5600e-003**	**36.8135**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2218	2.0300	2.1272	3.5000e-003		0.1052	0.1052		0.0990	0.0990	0.0000	301.2428	301.2428	0.0722	0.0000	303.0471
Total	**0.2218**	**2.0300**	**2.1272**	**3.5000e-003**		**0.1052**	**0.1052**		**0.0990**	**0.0990**	**0.0000**	**301.2428**	**301.2428**	**0.0722**	**0.0000**	**303.0471**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0492	1.3293	0.4713	5.3900e-003	0.1820	0.0151	0.1971	0.0525	0.0144	0.0669	0.0000	524.0510	524.0510	0.0141	0.0776	547.5317
Worker	0.4268	0.3350	4.0179	0.0108	1.2415	6.6400e-003	1.2482	0.3297	6.1200e-003	0.3359	0.0000	995.8912	995.8912	0.0284	0.0286	1,005.1289
Total	**0.4760**	**1.6644**	**4.4892**	**0.0162**	**1.4236**	**0.0217**	**1.4452**	**0.3823**	**0.0205**	**0.4028**	**0.0000**	**1,519.9422**	**1,519.9422**	**0.0425**	**0.1062**	**1,552.6606**

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3.5 Building Construction - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0426	0.2905	2.2698	3.5000e-003		5.3000e-003	5.3000e-003		5.3000e-003	5.3000e-003	0.0000	301.2425	301.2425	0.0722	0.0000	303.0467
Total	**0.0426**	**0.2905**	**2.2698**	**3.5000e-003**		**5.3000e-003**	**5.3000e-003**		**5.3000e-003**	**5.3000e-003**	**0.0000**	**301.2425**	**301.2425**	**0.0722**	**0.0000**	**303.0467**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0492	1.3293	0.4713	5.3900e-003	0.1820	0.0151	0.1971	0.0525	0.0144	0.0669	0.0000	524.0510	524.0510	0.0141	0.0776	547.5317
Worker	0.4268	0.3350	4.0179	0.0108	1.2415	6.6400e-003	1.2482	0.3297	6.1200e-003	0.3359	0.0000	995.8912	995.8912	0.0284	0.0286	1,005.1289
Total	**0.4760**	**1.6644**	**4.4892**	**0.0162**	**1.4236**	**0.0217**	**1.4452**	**0.3823**	**0.0205**	**0.4028**	**0.0000**	**1,519.9422**	**1,519.9422**	**0.0425**	**0.1062**	**1,552.6606**

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3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0267	0.2445	0.2762	4.6000e-004		0.0119	0.0119		0.0112	0.0112	0.0000	39.4068	39.4068	9.3700e-003	0.0000	39.6412
Total	**0.0267**	**0.2445**	**0.2762**	**4.6000e-004**		**0.0119**	**0.0119**		**0.0112**	**0.0112**	**0.0000**	**39.4068**	**39.4068**	**9.3700e-003**	**0.0000**	**39.6412**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.2600e-003	0.1392	0.0564	6.8000e-004	0.0238	1.0000e-003	0.0248	6.8700e-003	9.5000e-004	7.8200e-003	0.0000	65.7744	65.7744	1.7100e-003	9.7200e-003	68.7139
Worker	0.0516	0.0385	0.4818	1.3700e-003	0.1624	8.2000e-004	0.1632	0.0431	7.5000e-004	0.0439	0.0000	126.8010	126.8010	3.3300e-003	3.4400e-003	127.9095
Total	**0.0559**	**0.1778**	**0.5382**	**2.0500e-003**	**0.1862**	**1.8200e-003**	**0.1880**	**0.0500**	**1.7000e-003**	**0.0517**	**0.0000**	**192.5754**	**192.5754**	**5.0400e-003**	**0.0132**	**196.6233**

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3.5 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.5700e-003	0.0380	0.2968	4.6000e-004		6.9000e-004	6.9000e-004		6.9000e-004	6.9000e-004	0.0000	39.4068	39.4068	9.3700e-003	0.0000	39.6411
Total	**5.5700e-003**	**0.0380**	**0.2968**	**4.6000e-004**		**6.9000e-004**	**6.9000e-004**		**6.9000e-004**	**6.9000e-004**	**0.0000**	**39.4068**	**39.4068**	**9.3700e-003**	**0.0000**	**39.6411**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.2600e-003	0.1392	0.0564	6.8000e-004	0.0238	1.0000e-003	0.0248	6.8700e-003	9.5000e-004	7.8200e-003	0.0000	65.7744	65.7744	1.7100e-003	9.7200e-003	68.7139
Worker	0.0516	0.0385	0.4818	1.3700e-003	0.1624	8.2000e-004	0.1632	0.0431	7.5000e-004	0.0439	0.0000	126.8010	126.8010	3.3300e-003	3.4400e-003	127.9095
Total	**0.0559**	**0.1778**	**0.5382**	**2.0500e-003**	**0.1862**	**1.8200e-003**	**0.1880**	**0.0500**	**1.7000e-003**	**0.0517**	**0.0000**	**192.5754**	**192.5754**	**5.0400e-003**	**0.0132**	**196.6233**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0103	0.1019	0.1458	2.3000e-004		5.1000e-003	5.1000e-003		4.6900e-003	4.6900e-003	0.0000	20.0269	20.0269	6.4800e-003	0.0000	20.1888
Paving	9.5100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0198**	**0.1019**	**0.1458**	**2.3000e-004**		**5.1000e-003**	**5.1000e-003**		**4.6900e-003**	**4.6900e-003**	**0.0000**	**20.0269**	**20.0269**	**6.4800e-003**	**0.0000**	**20.1888**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.9000e-004	4.8800e-003	1.0000e-005	1.6400e-003	1.0000e-005	1.6500e-003	4.4000e-004	1.0000e-005	4.4000e-004	0.0000	1.2845	1.2845	3.0000e-005	3.0000e-005	1.2958
Total	**5.2000e-004**	**3.9000e-004**	**4.8800e-003**	**1.0000e-005**	**1.6400e-003**	**1.0000e-005**	**1.6500e-003**	**4.4000e-004**	**1.0000e-005**	**4.4000e-004**	**0.0000**	**1.2845**	**1.2845**	**3.0000e-005**	**3.0000e-005**	**1.2958**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Paving - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.8000e-003	0.0122	0.1730	2.3000e-004		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	20.0268	20.0268	6.4800e-003	0.0000	20.1888
Paving	9.5100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0123**	**0.0122**	**0.1730**	**2.3000e-004**		**3.7000e-004**	**3.7000e-004**		**3.7000e-004**	**3.7000e-004**	**0.0000**	**20.0268**	**20.0268**	**6.4800e-003**	**0.0000**	**20.1888**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.9000e-004	4.8800e-003	1.0000e-005	1.6400e-003	1.0000e-005	1.6500e-003	4.4000e-004	1.0000e-005	4.4000e-004	0.0000	1.2845	1.2845	3.0000e-005	3.0000e-005	1.2958
Total	**5.2000e-004**	**3.9000e-004**	**4.8800e-003**	**1.0000e-005**	**1.6400e-003**	**1.0000e-005**	**1.6500e-003**	**4.4000e-004**	**1.0000e-005**	**4.4000e-004**	**0.0000**	**1.2845**	**1.2845**	**3.0000e-005**	**3.0000e-005**	**1.2958**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.6081					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.1900e-003	0.0489	0.0679	1.1000e-004		2.6600e-003	2.6600e-003		2.6600e-003	2.6600e-003	0.0000	9.5747	9.5747	5.7000e-004	0.0000	9.5890
Total	**2.6153**	**0.0489**	**0.0679**	**1.1000e-004**		**2.6600e-003**	**2.6600e-003**		**2.6600e-003**	**2.6600e-003**	**0.0000**	**9.5747**	**9.5747**	**5.7000e-004**	**0.0000**	**9.5890**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0227	0.0170	0.2123	6.0000e-004	0.0715	3.6000e-004	0.0719	0.0190	3.3000e-004	0.0193	0.0000	55.8774	55.8774	1.4700e-003	1.5200e-003	56.3659
Total	**0.0227**	**0.0170**	**0.2123**	**6.0000e-004**	**0.0715**	**3.6000e-004**	**0.0719**	**0.0190**	**3.3000e-004**	**0.0193**	**0.0000**	**55.8774**	**55.8774**	**1.4700e-003**	**1.5200e-003**	**56.3659**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.7 Architectural Coating - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.6081					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1100e-003	4.8300e-003	0.0687	1.1000e-004		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	9.5747	9.5747	5.7000e-004	0.0000	9.5890
Total	**2.6092**	**4.8300e-003**	**0.0687**	**1.1000e-004**		**1.5000e-004**	**1.5000e-004**		**1.5000e-004**	**1.5000e-004**	**0.0000**	**9.5747**	**9.5747**	**5.7000e-004**	**0.0000**	**9.5890**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0227	0.0170	0.2123	6.0000e-004	0.0715	3.6000e-004	0.0719	0.0190	3.3000e-004	0.0193	0.0000	55.8774	55.8774	1.4700e-003	1.5200e-003	56.3659
Total	**0.0227**	**0.0170**	**0.2123**	**6.0000e-004**	**0.0715**	**3.6000e-004**	**0.0719**	**0.0190**	**3.3000e-004**	**0.0193**	**0.0000**	**55.8774**	**55.8774**	**1.4700e-003**	**1.5200e-003**	**56.3659**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.4002	2.4859	20.0954	0.0365	3.8326	0.0279	3.8605	1.0209	0.0260	1.0469	0.0000	3,401.2398	3,401.2398	0.2559	0.1743	3,459.5668
Unmitigated	2.4002	2.4859	20.0954	0.0365	3.8326	0.0279	3.8605	1.0209	0.0260	1.0469	0.0000	3,401.2398	3,401.2398	0.2559	0.1743	3,459.5668

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	3,572.47	3,572.47	3572.47	5,682,657	5,682,657
Enclosed Parking with Elevator	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Regional Shopping Center	2,119.62	2,590.26	1502.32	4,539,098	4,539,098
Total	5,692.09	6,162.73	5,074.79	10,221,754	10,221,754

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	4.37	4.37	4.37	100.00	0.00	0.00	100	0	0
Enclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Regional Shopping Center	16.60	8.40	6.90	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.550545	0.057163	0.176442	0.142301	0.027646	0.003370	0.005334	0.008094	0.000262	0.000119	0.025903	0.000447	0.002375
Enclosed Parking with Elevator	0.537785	0.055838	0.172353	0.139003	0.027005	0.007196	0.011392	0.017285	0.000559	0.000254	0.025303	0.000954	0.005071
Parking Lot	0.537785	0.055838	0.172353	0.139003	0.027005	0.007196	0.011392	0.017285	0.000559	0.000254	0.025303	0.000954	0.005071
Regional Shopping Center	0.550545	0.057163	0.176442	0.142301	0.027646	0.003370	0.005334	0.008094	0.000262	0.000119	0.025903	0.000447	0.002375

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,390.9324	1,390.9324	0.0863	0.0105	1,396.2061
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,390.9324	1,390.9324	0.0863	0.0105	1,396.2061
NaturalGas Mitigated	0.0544	0.4656	0.2013	2.9700e-003		0.0376	0.0376		0.0376	0.0376	0.0000	538.6927	538.6927	0.0103	9.8800e-003	541.8939
NaturalGas Unmitigated	0.0544	0.4656	0.2013	2.9700e-003		0.0376	0.0376		0.0376	0.0376	0.0000	538.6927	538.6927	0.0103	9.8800e-003	541.8939

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	9.93808e+006	0.0536	0.4579	0.1949	2.9200e-003		0.0370	0.0370		0.0370	0.0370	0.0000	530.3338	530.3338	0.0102	9.7200e-003	533.4853
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	156640	8.4000e-004	7.6800e-003	6.4500e-003	5.0000e-005		5.8000e-004	5.8000e-004		5.8000e-004	5.8000e-004	0.0000	8.3589	8.3589	1.6000e-004	1.5000e-004	8.4086
Total		**0.0544**	**0.4656**	**0.2013**	**2.9700e-003**		**0.0376**	**0.0376**		**0.0376**	**0.0376**	**0.0000**	**538.6927**	**538.6927**	**0.0103**	**9.8700e-003**	**541.8939**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	9.93808e+006	0.0536	0.4579	0.1949	2.9200e-003		0.0370	0.0370		0.0370	0.0370	0.0000	530.3338	530.3338	0.0102	9.7200e-003	533.4853
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	156640	8.4000e-004	7.6800e-003	6.4500e-003	5.0000e-005		5.8000e-004	5.8000e-004		5.8000e-004	5.8000e-004	0.0000	8.3589	8.3589	1.6000e-004	1.5000e-004	8.4086
Total		**0.0544**	**0.4656**	**0.2013**	**2.9700e-003**		**0.0376**	**0.0376**		**0.0376**	**0.0376**	**0.0000**	**538.6927**	**538.6927**	**0.0103**	**9.8700e-003**	**541.8939**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	2.73637e+006	660.2910	0.0410	4.9600e-003	662.7945
Enclosed Parking with Elevator	1.99974e+006	482.5424	0.0299	3.6300e-003	484.3719
Parking Lot	163800	39.5253	2.4500e-003	3.0000e-004	39.6751
Regional Shopping Center	864368	208.5738	0.0129	1.5700e-003	209.3646
Total		**1,390.9324**	**0.0863**	**0.0105**	**1,396.2061**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	2.73637e+006	660.2910	0.0410	4.9600e-003	662.7945
Enclosed Parking with Elevator	1.99974e+006	482.5424	0.0299	3.6300e-003	484.3719
Parking Lot	163800	39.5253	2.4500e-003	3.0000e-004	39.6751
Regional Shopping Center	864368	208.5738	0.0129	1.5700e-003	209.3646
Total		**1,390.9324**	**0.0863**	**0.0105**	**1,396.2061**

6.0 Area Detail

6.1 Mitigation Measures Area

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.3006	0.2042	7.2070	1.1600e-003		0.0494	0.0494		0.0494	0.0494	0.0000	152.7384	152.7384	0.0140	2.5900e-003	153.8599
Unmitigated	3.3006	0.2042	7.2070	1.1600e-003		0.0494	0.0494		0.0494	0.0494	0.0000	152.7384	152.7384	0.0140	2.5900e-003	153.8599

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2608					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.8082					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0143	0.1218	0.0518	7.8000e-004		9.8500e-003	9.8500e-003		9.8500e-003	9.8500e-003	0.0000	141.0446	141.0446	2.7000e-003	2.5900e-003	141.8827
Landscaping	0.2173	0.0824	7.1552	3.8000e-004		0.0396	0.0396		0.0396	0.0396	0.0000	11.6939	11.6939	0.0113	0.0000	11.9772
Total	**3.3006**	**0.2042**	**7.2070**	**1.1600e-003**		**0.0494**	**0.0494**		**0.0494**	**0.0494**	**0.0000**	**152.7384**	**152.7384**	**0.0140**	**2.5900e-003**	**153.8599**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2608					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.8082					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0143	0.1218	0.0518	7.8000e-004		9.8500e-003	9.8500e-003		9.8500e-003	9.8500e-003	0.0000	141.0446	141.0446	2.7000e-003	2.5900e-003	141.8827
Landscaping	0.2173	0.0824	7.1552	3.8000e-004		0.0396	0.0396		0.0396	0.0396	0.0000	11.6939	11.6939	0.0113	0.0000	11.9772
Total	**3.3006**	**0.2042**	**7.2070**	**1.1600e-003**		**0.0494**	**0.0494**		**0.0494**	**0.0494**	**0.0000**	**152.7384**	**152.7384**	**0.0140**	**2.5900e-003**	**153.8599**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	258.7412	1.6539	0.0405	312.1654
Unmitigated	258.7412	1.6539	0.0405	312.1654

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	45.0214 / 28.3831	231.8315	1.4805	0.0363	279.6546
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	5.27396 / 3.23243	26.9097	0.1734	4.2500e-003	32.5109
Total		**258.7412**	**1.6539**	**0.0405**	**312.1654**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	45.0214 / 28.3831	231.8315	1.4805	0.0363	279.6546
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	5.27396 / 3.23243	26.9097	0.1734	4.2500e-003	32.5109
Total		**258.7412**	**1.6539**	**0.0405**	**312.1654**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	79.6983	4.7100	0.0000	197.4492
Unmitigated	79.6983	4.7100	0.0000	197.4492

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	317.86	64.5227	3.8132	0.0000	159.8523
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	74.76	15.1756	0.8969	0.0000	37.5969
Total		**79.6983**	**4.7100**	**0.0000**	**197.4492**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	317.86	64.5227	3.8132	0.0000	159.8523
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	74.76	15.1756	0.8969	0.0000	37.5969
Total		**79.6983**	**4.7100**	**0.0000**	**197.4492**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Equipment Type	Number

11.0 Vegetation

Appendix B

EMFAC2017 Vehicle Consumption Data

EMFAC2017 (v1.0.2) Emissions Inventory
Region Type: Air District
Region: South Coast AQMD
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC2011Categories
Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	CalYr	VehClass	Fuel	Population	VMT	Fuel_Consumption	Fuel Split (Gas:Diesel)	MPG, by Fuel Type	MPG, Average
SOUTH COAST AQMD	2023	LDA	GAS	6635002.295	252710542.7	7971.24403	99.38%	31.70	32.59
South Coast AQMD	2023	LDA	DSL	62492.97958	2469815.67	49.3916685	0.62%	50.00	
South Coast AQMD	2023	LDA	ELEC	150700.3971	6237105.777	0			
South Coast AQMD	2023	LDT1	GAS	758467.6481	27812996.47	1023.913006	99.96%	27.16	27.46
South Coast AQMD	2023	LDT1	DSL	360.7799144	8408.618214	0.366459477	0.04%	22.95	
South Coast AQMD	2023	LDT1	ELEC	7122.93373	303507.5334	0			
South Coast AQMD	2023	LDT2	GAS	2285150.139	85272415.53	3338.798312	99.47%	25.54	25.6
South Coast AQMD	2023	LDT2	DSL	15594.68309	650362.8069	17.73812611	0.53%	36.66	
South Coast AQMD	2023	LDT2	ELEC	28809.63735	917592.8423	0			
South Coast AQMD	2023	MDV	GAS	1589862.703	55684188.36	2693.883526	98.15%	20.67	20.81
South Coast AQMD	2023	MDV	DSL	36128.1019	1425691.372	50.65281491	1.85%	28.15	
South Coast AQMD	2023	MDV	ELEC	16376.67653	537591.7438	0			
South Coast AQMD	2023	LHD1	GAS	174910.3847	6216642.74	583.3851736	71.88%	10.66	13.81
South Coast AQMD	2023	LHD1	DSL	125545.0822	4994753.051	228.1779285	28.12%	21.89	
South Coast AQMD	2023	LHD2	GAS	30102.75324	1034569.096	111.5753864	53.28%	9.27	14.18
South Coast AQMD	2023	LHD2	DSL	50003.13116	1935029.912	97.84811618	46.72%	19.78	
South Coast AQMD	2023	MHDT	GAS	25624.3151	1363694.415	265.2060557	26.79%	5.14	9.58
South Coast AQMD	2023	MHDT	DSL	122124.488	8120623.353	724.7695868	73.21%	11.20	
South Coast AQMD	2023	HHDT	GAS	75.10442936	8265.097091	1.936286145	0.10%	4.27	6.94
South Coast AQMD	2023	HHDT	DSL	115130.71	13671497.32	1970.514243	99.90%	6.94	
South Coast AQMD	2023	OBUS	GAS	5955.291639	245774.0168	48.07750689	100.00%	5.11	5.11
South Coast AQMD	2023	OBUS	DSL	0	0	0	0.00%	0.00	
South Coast AQMD	2023	UBUS	GAS	957.7686184	89782.63172	17.62416327	98.66%	5.09	5.18
South Coast AQMD	2023	UBUS	DSL	13.00046095	1416.621572	0.239500509	1.34%	5.91	
South Coast AQMD	2023	UBUS	ELEC	16.11693886	1320.163255	0			
South Coast AQMD	2023	SBUS	GAS	2783.643068	112189.6089	12.19474692	30.76%	9.20	8.15
South Coast AQMD	2023	SBUS	DSL	6671.825716	210853.9115	27.44411242	69.24%	7.68	
South Coast AQMD	2023	MCY	GAS	305044.5141	2104623.657	57.849018	100.00%	36.38	36.38
South Coast AQMD	2023	MH	GAS	34679.50542	330042.9197	63.26295123	84.47%	5.22	6.07
South Coast AQMD	2023	MH	DSL	13122.69387	124302.0239	11.63031832	15.53%	10.69	

APPENDIX E
OTHER CEQA TOPICS/ENVIRONMENTAL ANALYSIS CHECKLIST

UPDATES TO THE CEQA GUIDELINES

The State of California adopted revisions to the CEQA Guidelines which became effective on January 1, 2019. Pursuant to CEQA Guidelines Sections 15007(d), the City of Ontario must comply with the new Guidelines 120 days after they become effective, which in this case is May 1, 2019. City staff have provided the following supplemental discussion of CEQA Guidelines Appendix G topics where appropriate. Additionally, this section includes a discussion of the CEQA Environmental Checklist.

ENVIRONMENTAL ANALYSIS CHECKLIST

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
1. AESTHETICS. Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒
2. AGRICULTURE AND FOREST RESOURCES. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
3. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☒	☐	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒
4. BIOLOGICAL RESOURCES. Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
5. CULTURAL RESOURCES. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☐	☐	☒
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒
6. GEOLOGY AND SOILS. Would the project:				
a) Result in potentially significant environmental impact due to the wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation:	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficient:	☐	☐	☒	☐
7. GEOLOGY AND SOILS. Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii. Strong seismic ground shaking?	☐	☐	☐	☒
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv. Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18 1 B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
8. GREENHOUSE GAS EMISSIONS. Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emission of greenhouse gases?	☐	☐	☒	☐
9. HAZARDS AND HAZARDOUS MATERIALS. Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within the safety zone of the airport land use compatibility plan for ONT or Chino Airports, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒
10. HYDROLOGY AND WATER QUALITY. Would the project:				
a) Violate any other water quality standards or waste discharge requirements or potential for discharge of storm water pollutants from areas of material storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas or loading docks, or other outdoor work areas?	☐	☒	☐	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site or volume of storm water runoff to cause environmental harm or potential for significant increase in erosion of the project site or surrounding areas?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site or potential for significant changes in the flow velocity or volume of storm water runoff to cause environmental harm?	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff during construction and/or post- construction activity?	☐	☐	☐	☒
f) Otherwise substantially degrade water quality or potential for discharge of storm water to affect the beneficial uses of receiving water?	☐	☒	☐	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Expose people or structures to inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒
11. LAND USE AND PLANNING. Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, airport land use compatibility plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒
12. MINERAL RESOURCES. Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally- important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
13. NOISE. Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within the noise impact zones of the airport land use compatibility plan for ONT and Chino Airports, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
14. POPULATION AND HOUSING. Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of road or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
15. PUBLIC SERVICES. Would the project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
i. Fire protection?	☐	☒	☐	☐
ii. Police protection?	☐	☒	☐	☐
iii. Schools?	☐	☒	☐	☐
iv. Parks?	☐	☒	☐	☐
v. Other public facilities?	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
16. RECREATION. Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which have an adverse physical effect on the environment?	☐	☐	☐	☒
17. TRANSPORTATION/TRAFFIC. Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b) Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
18. TRIBAL CULTURAL RESOURCES. Would the project:				
a) Cause a substantial adverse change in the significance of a Tribal Cultural Resource as defined in Public Resources Code Section 21074?	☐	☐	☐	☒
19. UTILITIES AND SERVICE SYSTEMS. Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed? In making this determination, the City shall consider whether the project is	☐	☒	☐	☐

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
subject to the water supply assessment requirements of Water Code Section 10910, et seq. (SB 610), and the requirements of Government Code Section 664737 (SB 221).				
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☒	☐	☐
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☒	☐	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒
20. WILDFIRE. Would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d) Expose people or structures to significant risks, including downslope, or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒
21. MANDATORY FINDINGS OF SIGNIFICANCE.				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals?	☐	☐	☐	☒
c) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current project, and the effects of probable future projects.)	☐	☐	☒	☐
d) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

EXPLANATION OF THRESHOLDS

1. AESTHETICS

Would the project:

a) Have a substantial adverse effect on a scenic vista?

Discussion of Effects: The Policy Plan (General Plan) does not identify scenic vistas within the City. However, the Policy Plan (Policy CD1-5) requires all major north-south streets to be designed and redeveloped to feature views of the San Gabriel Mountains located to the east. The Project site is located south of Fourth Street, north of Concours Street, between Haven Avenue and Milliken Avenue, and less than one-quarter mile north of Interstate 10 (I-10); refer to Figure 1. The Project site is not located in a major north-south arterial street as identified in the Functional Roadway Classification Plan (Figure M-2) of the Mobility Element within the General Plan.

Additionally, implementation of the proposed Project would result in development of commercial/retail and residential uses that are similar in scale, character, and intensity to those envisioned under the adopted OCSP and assessed in the Certified EIR. On this basis, the Project is not anticipated to result in different or greater aesthetic impacts than those identified in the Certified EIR. Therefore, no adverse impacts are anticipated in relation to the Project.

Mitigation: None required.

b) Substantially damage scenic resources, including, but not limited to, tress, rock outcroppings and historic buildings within a state scenic highway?

Discussion of Effects: The City of Ontario is served by three freeways: I-10, I-15, and SR-60. I-10 and SR-60 traverse the northern and central portion of the City, respectively, in an east–west direction. I-15 traverses the northeastern portion of the City in a north–south direction. These segments of I-10, I-15, and SR-60 have not been officially designated as scenic highways by the California Department of Transportation. In addition, there are no historic buildings, or any scenic resources identified on or in the vicinity of the Project site. Therefore, it would not result in adverse environmental impacts.

Mitigation: None required.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

Discussion of Effects: The proposed Project would not degrade the existing visual character or quality of the site or its surroundings. The Project site is located in an area that is characterized by a mix of commercial, entertainment retail, office, and high-density residential land uses, and is surrounded by commercial and office land uses.

The proposed Project would substantially improve the visual quality of the area through development of the site with a mix of commercial, entertainment retail, office, and high-density residential land uses, which would be consistent with the policies of the Community Design Element of the Policy Plan (General Plan) and zoning designations on the property, as well as with the commercial and office development in the surrounding area. Therefore, no adverse impacts are anticipated.

Mitigation: None required.

d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

Discussion of Effects: New lighting would be introduced to the site with the development of the proposed Project. Pursuant to the requirements of the City's Development Code, Project on-site lighting would be shielded, diffused or indirect, to avoid glare to pedestrians or motorists. In addition, lighting fixtures would be selected and located to confine the area of illumination to within the Project site and minimize light spillage.

Site lighting plans would be subject to review by the Planning Department and Police Department prior to issuance of building permits (pursuant to the City's Building Security Ordinance). Therefore, no adverse impacts are anticipated.

Mitigation: None required.

2. AGRICULTURE AND FOREST RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

Discussion of Effects: The site is presently vacant and does not contain any agricultural uses. Further, the site is identified as "Other Land" and "Urban and Built-Up Land" on the map prepared by the California Resources Agency, pursuant to the Farmland Mapping and Monitoring Program. The "Other Land" consists of vacant and nonagricultural land that is greater than 40 acres in area and is surrounded on all sides by urban development. As a result, no adverse environmental impacts are anticipated.

Mitigation: None required.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

Discussion of Effects: The Project site is not zoned for agricultural use. The project site is zoned SP (Specific Plan) and is located within the Urban Commercial land use district and the Piemonte Overlay district of the OCSP, which is intended for development with a mix of commercial, entertainment retail, office, and high density residential land uses. The proposed Project is consistent with the development standards and allowed land uses of the proposed land use district. Furthermore, there is no Williamson Act contract in effect on the subject site. Therefore, no impacts to agricultural uses are anticipated, nor would there be any conflict with existing or Williamson Act contracts.

Mitigation: None required.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)?

Discussion of Effects: The proposed Project is intended for development with a mix of commercial, entertainment retail, office, and high-density residential land uses. The proposed Project is consistent with the Land Use Element (Figure LU-6) of the Policy Plan (General Plan) and the development standards and allowed land uses of the Urban Commercial land use district and the Piemonte Overlay district of the OCSP. Therefore, no adverse impacts are anticipated.

Mitigation: None required.

d) Result in the loss of forest land or conversion of forest land to non-forest use?

Discussion of Effects: There is currently no land in the City of Ontario that qualifies as forest land as defined in Public Resources Code section 12220(g). Neither The Ontario Plan nor the City's Zoning Code provide designations for forest land. Consequently, the proposed Project would not result in the loss or conversion of forest land.

Mitigation: None required.

e) Involve other changes in the existing environment, which, due to their location or nature, could individually or cumulatively result in loss of Farmland to non-agricultural use or conversion of forest land to non-forest use?

Discussion of Effects: The proposed Project site is not designated as Farmland is currently zoned Specific Plan, and is located within the Urban Commercial land use district and the Piemonte Overlay district of the OCSP, which is intended for development with a mix of commercial, entertainment retail, office, and high-density residential land uses. The proposed Project site is currently partly vacant, but previously graded, on the northern portion of the site and fully developed with parking areas currently utilized for the Toyota Arena. There are no agricultural uses occurring onsite. As a result, to the extent that the Project would result in changes to the existing environment those changes would not result in loss of Farmland to non-agricultural use.

Additionally, there is currently no land in the City of Ontario that qualifies as forest land as defined in Public Resources Code Section 12220(g). Neither The Ontario Plan nor the City's Zoning Code provide designations for forest land. Consequently, to the extent that the proposed Project would result in changes to the existing environment, those changes would not impact forest land.

Mitigation Required: None required.

3. AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

a) Conflict with or obstruct implementation of the applicable air quality plan?

Discussion of Effects: The Project would not conflict with or obstruct implementation of any air quality plan. As noted in The Ontario Plan FEIR (Section 5.3), pollutant levels in the Ontario area already exceed Federal and State standards. To reduce pollutant levels, the City of Ontario is actively participating in

efforts to enhance air quality by implementing Control Measures in the Air Quality Management Plan for local jurisdictions within the South Coast Air Basin.

The proposed Project is consistent with The Ontario Plan, for which the EIR was prepared and impacts evaluated. Furthermore, the Project is consistent with the City's participation in the Air Quality Management Plan (AQMP).

Additionally, implementation of the Project would result in the construction of commercial/retail and residential uses in a much lower scope and character to those assessed in the Certified EIR. As such, construction-related air pollutant emissions would be lower to than those considered in the Certified EIR. Further, shown in Table 3-7, the proposed Project would not exceed any construction emission thresholds. Additionally, as discussed in the Addendum, a reduction in total average daily traffic generation is anticipated under the Project. As a result, reductions in vehicle pollutant emissions are anticipated. Based on the preceding discussion, the proposed Project would not result in different or greater air quality impacts than those identified in the Certified EIR. Please refer also to Addendum Section 3.5.3, "Air Quality." A less than significant impact would occur.

Mitigation: None required.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Discussion of Effects: Short term air quality impacts will result from construction related activities associated with construction activity, such as excavation and grading, machinery and equipment emissions, vehicle emissions from construction employees, etc. The daily emissions of nitrogen oxides and particulates from resulting grading and vehicular emissions may exceed threshold levels of the South SCAQMD.

The Project must follow mandatory SCAQMD rules and requirements with regards to fugitive dust control, as described in Section 6.1.3 of the SCAQMD rules. Compliance with the standard dust control measures is considered to be part of the conditions of approval for the Project and built into the design features. Table 3-7, shows that, the Project's daily construction emissions would be below the applicable SCAQMD air quality standards and thresholds of significance. As a result, the Project would not contribute substantially to an existing or projected air quality violation. As noted in Table 1-1, the Certified EIR include a set of mitigation measures that are applicable to the proposed Project.

Mitigation: Air Quality

MM-AQ-1 Regular watering, paving construction roads, or other dust control measures defined in SCAQMD Rule 403 will occur during construction.

MM-AQ-2 Construction equipment will be maintained in proper tune to minimize the volume of equipment exhaust emissions.

MM-AQ-3 Comprehensive ridesharing incentive program will be developed as part of a Transportation System Management.

MM-AQ-4 Orientation of Project for transit convenience and accessibility will occur in design phase; provision of easy pedestrian access will occur in design phase; provision of bus shelters, benches and bus pockets on streets.

MM-AQ-5 Provision of traffic flow improvements will occur as buildout of project occurs.

MM-AQ-6 Inclusion of solar and other energy-saving devices in residences and businesses including:

- delamping
- increased building insulation
- heating/ventilation/air conditioning improvements
- solar heaters
- utilization of landscape features to shade buildings

MM-AQ-7 Construction activities should avoid high ozone days and discontinue construction during second stage alerts. After grading, seed and water until vegetation cover is established.

MM-AQ-8 Wet area down, sufficient enough to form a crust on the surface with repeated soakings, as necessary, to maintain the crust and prevent dust pickup by the wind.

MM-AQ-9 Use water trucks or sprinkler systems to keep all areas where vehicles move damp enough to prevent dust from being raised beyond site operations. Wet construction areas down in the late morning and after work is completed in the day.

MM-AQ-10 Use low sulfur fuel for construction equipment (0.5 percent by weight).

As noted in the Certified EIR, a less than significant impact will occur with implementation of the applicable mitigation measures.

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?

Discussion of Effects: The Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the region is in non-attainment under an applicable federal or state ambient air quality because of the limited size and scope of the project. Although no impacts are anticipated, the Project would still comply with the air quality standards of the TOP FEIR and the SCAQMD resulting in impacts that are less than significant [please refer also to Addendum Section 3.5.3, "Air Quality."] A less than significant impact would occur.

Mitigation: None required.

d) Expose sensitive receptors to substantial pollutant concentrations?

Discussion of Effects: Sensitive receptors are defined as populations that are more susceptible to the effects of pollution than the population at large. The SCAQMD identifies the following as sensitive receptors: long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, childcare centers, and athletic facilities. According to the SCAQMD, projects have the potential to create significant impacts if they are located within one-quarter mile of sensitive receptors and would emit toxic air contaminants identified in SCAQMD Rule 1401.

Given the close proximity of the project to nearest sensitive receptors (residential homes to the north), several measures are provided to help ensure the potential health risk associated with Diesel Particulate Matter (DPM) during construction is reduced to the maximum extent feasible. This includes a requirement for Tier 4 engines on all diesel-powered construction equipment. Tier 4 engines, along with the latest

national fuel standards, have been shown to yield PM reductions of over 95 percent from the typical Tier 2 and Tier 3 engines[8].

It is presumed that with the recommended design features and Tier 4 engines in place that the potential short term construction health risks would be adequately reduced to be less than significant. Design features DF-3 through DF-9 are recommended to help ensure the Project does not expose receptors to substantial pollution concentrations during construction. However, these are not considered mitigation measures. A less than significant impact would occur.

Mitigation: None required.

e) Create objectionable odors affecting a substantial number of people?

Discussion of Effects: The uses proposed on the subject site, as well as those permitted within the Urban Commercial land use district and the OCSP, do not create objectionable odors. Further, the Project shall comply with the policies of the Ontario Municipal Code and the General Plan. Additionally, as noted in the Air Quality and Greenhouse Gas Analysis, the Project's operations would result in less than significant odor impacts. Therefore, no adverse impacts are anticipated.

4. BIOLOGICAL RESOURCES

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Discussion of Effects: The site is located within an area that has historically been found to contain Delhi Soils, which is potential habitat for the Delhi Sand Flower-loving Fly (DSF), a federally listed endangered species. However, as a result of previous development, grading, and land uses on the Project site, including construction and operation of the Ontario Motor Speedway (razed in 1981), and more recently, construction activity associated with the phased development of approximately 1.3 million square feet of retail, office, hotel, and entertainment uses, and 800 multiple-family dwelling units, including mass grading of the entire Project area, the installation of public utilities, and the construction of street improvements, have left the Project site in an extremely disturbed state. This determination is supported by previous environmental reports addressing the Project site, including Ontario International Centre EIR 80-3 (SCH No. 80062538), Certified EIR 88-2 (SCH No. 89041009), and the POCA, all of which have found the Project site to be in an extremely disturbed state, with no native soils or native vegetation on the site. The Project site has not been designated as a planned recovery zone for the DSF, and in its current condition, does not provide suitable habitat. No impact would occur.

Mitigation: None required.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife, or U.S. Fish and Wildlife Service?

[8] EPA. Control of Emissions of Air Pollution from Nonroad Diesel Engines and Fuel; Final Rule. (40 CFR Parts 9, 69, et al.)

Discussion of Effects: The Project site does not contain any riparian habitat or other sensitive natural community identified by the California Department of Fish & Wildlife, or U.S. Fish & Wildlife Service. Therefore, no adverse environmental impacts are anticipated.

Mitigation: None required.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Discussion of Effects: No wetland habitat is present on site. Therefore, Project implementation would have no impact on these resources.

Mitigation: None required.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Discussion of Effects: The Project site is a mixed vacant and fully developed property that is bounded on all four sides by development. As a result, there are no wildlife corridors connecting this site to other areas. Therefore, no adverse environmental impacts are anticipated.

Mitigation: None required.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Discussion of Effects: The City of Ontario does not have any ordinances protecting biological resources. Further, the site does not contain any mature trees necessitating the need for preservation. As a result, no adverse environmental impacts are anticipated.

Mitigation: None required.

f) Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or state habitat conservation plan?

Discussion of Effects: The site is not part of an adopted HCP, NCCP or other approved habitat conservation plan. As a result, no adverse environmental impacts are anticipated.

Mitigation: None required.

5. CULTURAL RESOURCES

Would the project:

a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?

Discussion of Effects: The Project site does not contain any buildings, structures, or objects. Additionally, as part of the Project site development during the OCSP, CECA, POCA, POOSCP, the Project site has been previously disturbed and fully graded. Therefore, no adverse impacts are anticipated.

Mitigation: None required.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

Discussion of Effects: The Ontario Plan FEIR (Section 5.5) indicates no archeological sites or resources have been recorded in the City with the Archeological Information Center at San Bernardino. As noted above, because the site has been previously fully disturbed and graded and no historical structures existing on-site, no adverse change in significance or an archaeological resource is anticipated.

Mitigation: None required.

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Discussion of Effects: As described in the Certified EIR, cultural resources were not anticipated to be affected by the OCSP. As previously noted, the Project site has been previously graded. As such, the proposed Project would not affect areas or resources not previously considered in the Certified EIR. No additional or different impacts have been identified based on the Project

Mitigation: None required.

d) Disturb any human remains, including those interred outside of formal cemeteries?

Discussion of Effects: The proposed Project is in an area that has been previously disturbed by development. No known religious or sacred sites exist within the Project area. Thus, human remains are not expected to be encountered during any construction activities. However, in the unlikely event that human remains are discovered, existing regulations, including the California Public Resources Code Section 5097.98, would afford protection for human remains discovered during development activities. Furthermore, standard conditions have been imposed on the Project that in the event of unanticipated discoveries of human remains are identified during excavation, construction activities, the area shall not be disturbed until any required investigation is completed by the County Coroner and/or Native American consultation has been completed, if deemed applicable.

Mitigation: None required.

6. Energy

Would the project:

a) Result in potentially significant environmental impact due to the wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation:

A Project specific Energy Study was prepared by RK Engineering Group, Inc. Findings are summarized herein, and the technical study is available as Appendix D of this Addendum.

Discussion of Effects: As described in the Certified EIR, the Project's impact is considered less than significant with the inclusion of the mandatory requirements of California's Building Energy Efficiency Standards (Title 24, Part 6) and Green Building Standards (CALGreen, Title 24, Part 11). California's building energy efficiency standards are some of the strictest in the nation and the Project's compliance with California's building code would ensure that wasteful, inefficient or unnecessary consumption of energy

is minimized. The building standards code is designed to reduce the amount of energy needed to heat or cool a building and reduce energy usage for lighting and appliances.

The proposed Project is anticipated to have a less than significant impact on energy. The following recommended energy design features (DF) are provided to further reduce wasteful, inefficient and unnecessary consumption of energy. Design features are consistent with the recommended design features provided with Air/GHG study. These DF are not considered mitigation measures.

Construction Energy Design Features

E-DF-1 Establish an electricity supply to the construction site and use electric powered equipment instead of diesel-powered equipment or generators, where feasible.

Operational Design Features

E-DF-2 Implement the GHG Reduction Measures from the Ontario County Climate Action Plan (CAP) Screening Tables to achieve at least 100 points, per the requirements for Mixed Use Projects.

E-DF-3 Comply with the mandatory requirements of California Building Standards Code Title 24 Part 6 (Energy Code) and Title 24 Part 11 (CAL Green).

E-DF-4 Implement water conservation strategies, including low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and limit the amount of turf/sod, per CAL Green and City of Ontario requirements.

E-DF-5 Implement zero waste strategies, recycling and composting programs for residential and non-residential uses.

E-DF-6 Encourage residents and landscape maintenance crews to use electric landscaping equipment, such as lawnmowers and leaf blowers, wherever feasible.

E-DF-7 No natural gas or wood burning fireplaces shall be installed in any residential dwelling.

E-DF-8 Implement trip reduction measures that reduce the number of auto-based trips and encourage the use of transit, bicycling, and walking. Such as;

1. Improve the walkability and design of the project by including pedestrian and bicycling connections within the project site and to adjacent off-site facilities (i.e., sidewalks, crosswalks, foot paths, protected bike lanes, multi-purpose trails, direct parcel-to-parcel connections, wayfinding signage, etc.).
2. Provide traffic calming measures (i.e., marked crosswalks, raised crosswalks, raised intersections, count-down signal timers, curb extensions, speed tables, median islands, tight corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, etc.)
3. Provide bicycle racks for the retail and commercial uses and secure bicycle parking areas for the office and residential uses.

E-DF-9 Provide electric vehicle charging stations per the requirements of CALGreen.

A less than significant impact would occur.

Mitigation: None required.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficient:

Discussion of Effects: The proposed Project's impact is considered less than significant as the Project would purchase electricity through Southern California Edison which is subject to the requirements of California Senate Bill 100 (SB 100). SB 100 is the most stringent and current energy legislation in California; requiring that renewable energy resources and zero-carbon resources supply 100 percent of retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045.1 The Project would further comply with the mandatory requirements of California's Green Building and Building Energy Efficiency standards that promote renewable energy and energy efficiency. A less than significant impact would occur.

Mitigation: None required.

7. GEOLOGY & SOILS

Would the project:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

Discussion of Effects: There are no active faults known on the site and the Project site is located outside the Fault Rapture Hazard Zone (formerly Alquist-Priolo Zone). The Ontario Plan FEIR (Section 5.7/ Figure 5.7-2) identifies eight active or potentially active fault zones near the City. Given that the closest fault zone is located more than ten miles from the Project site, fault rupture within the Project area is not likely. All development would comply with the UBC seismic design standards to reduce geologic hazard susceptibility. Therefore, no adverse impacts are anticipated.

Mitigation: None required.

ii) Strong seismic ground shaking?

Discussion of Effects: There are no active faults known on the site and the Project site is located outside the Fault Rapture Hazard Zone (formerly Alquist-Priolo Zone). The Land Use Plan (Figure LU-6) of the Policy Plan (General Plan) FEIR (Section 5.7/Figure 5.7-2) identifies eight active or potentially active fault zones near the City. The closest fault zone is located more than ten miles from the Project site. The proximity of the site to the active faults would result in ground shaking during moderate to severe seismic events. All construction would be in compliance with the California Building Code (CBC), the Ontario Municipal Code, The Ontario Plan and all other ordinances adopted by the City related to construction and safety. Therefore, no adverse impacts are anticipated.

Mitigation: None required.

iii) Seismic-related ground failure, including liquefaction?

Discussion of Effects: As identified in the TOP FEIR (Section 5.7), groundwater saturation of sediments is required for earthquake induced liquefaction. In general, groundwater depths shallower than 10 feet to the surface can cause the highest liquefaction susceptibility. According to the POOC MND, depth to ground water at the Project site during the winter months is estimated to be between 250 to 450 feet below ground surface. Therefore, the liquefaction potential within the Project area is minimal.

Implementation of The Ontario Plan strategies, UBC and Ontario Municipal Code would reduce impacts to a less than significant level.

Mitigation: None required.

iv) Landslides?

Discussion of Effects: The proposed Project would not expose people or structures to potential adverse effects, including the risk of loss, injury, or death involving landslides because the relatively flat topography of the Project site (less than two percent slope across the City) makes the chance of landslides remote. Implementation of The Ontario Plan strategies, UBC and OMC would reduce impacts to a less than significant level.

Mitigation: None required.

b) Result in substantial soil erosion or the loss of topsoil?

Discussion of Effects: The proposed Project would not result in significant soil erosion or loss of topsoil because of the previously disturbed and developed nature of the Project site and the limited size and scope of the Project. Grading increases the potential for erosion by removing protective vegetation, changing natural drainage patterns, and constructing slopes. However, compliance with the CBC and review of grading plans by the City Engineer would ensure no significant impacts would occur. In addition, the City requires an erosion/dust control plan for projects located within this area. Implementation of a NPDES program, the Environmental Resource Element of the General Plan strategies, UBC, and OMC would reduce impacts to a less than significant level.

Mitigation: None required.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Discussion of Effects: The Project site would not result in the location of development on a geologic unit or soil that is unstable, or that would become unstable because as previously discussed, the potential for liquefaction and landslides associated with the Project site is less than significant. The Ontario Plan FEIR (Section 5.7) indicates that subsidence is generally associated with large decreases or withdrawals of water from the aquifer. The Project would not withdraw water from the existing aquifer. Further, implementation of The Ontario Plan strategies, UBC and OMC would reduce impacts to a less than significant level.

Mitigation: None required.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Discussion of Effects: The majority of Ontario, including the Project site, is located on alluvial soil deposits. These types of soils are not considered to be expansive. Therefore, no adverse impacts are anticipated.

Mitigation: None required.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

Discussion of Effects: The area is served by the local sewer system and the use of alternative systems is not necessary. There would be no impact to the sewage system.

Mitigation: None required.

8. GREENHOUSE GAS EMISSIONS

Would the project:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Discussion of Effects: The impact of buildout of The Ontario Plan on the environment due to the emission of greenhouse gases ("GHGs") was analyzed in the Environmental Impact Report ("EIR") for the Policy Plan (General Plan). According to the EIR, this impact would be significant and unavoidable. (Recirculated Portions of the Ontario Plan Draft Environmental Impact Report, p. 2-118). This EIR was certified by the City on January 27, 2010, at which time a statement of overriding considerations was also adopted for The Ontario Plan's significant and unavoidable impacts, including that concerning the emission of GHGs.

Pursuant to Public Resources Code section 21083.3, this impact need not be analyzed further, because (1) the proposed project would result in an impact that was previously analyzed in The Ontario Plan EIR, which was certified by the City; (2) the proposed project would not result in any greenhouse gas impacts that were not addressed in The Ontario Plan EIR; (3) the proposed project is consistent with The Ontario Plan.

A Project-specific Air Quality and Greenhouse Gas Impact Study was prepared. The results are provided herein, and the technical study is included as Appendix B of this Addendum. For purposes of this Project, the City of Ontario, Ontario County Climate Action Plan (CCAP) establishes the requirements for determining whether a project would have a significant impact to GHG emissions under CEQA.

The CCAP uses Screening Tables, which are setup similar to a checklist, with points allocated to certain elements of the Project to reduce GHG emissions. If a project garners 100 points (by including enough GHG reducing elements), then the project is consistent with CCAP and the impact may be considered less than significant for purposes of CEQA.

The proposed Project is expected to comply with the CCAP by implementing the Screening Table requirements into the Project design. To help ensure the Project adheres to the CCAP requirements, the following GHG Project DFs GHG-DF-10 through GHG-DF-17 are provided:

Design Features

GHG-DF-10 Implement the GHG Reduction Measures from the CCAP Screening Tables to achieve at least 100 points, per the requirements for Mixed Use Projects.

As described in Appendix B of the CCAP, for mixed use projects, both the residential and non-residential screening tables shall be completed. Mixed use Projects that garner at least 100 points will be consistent with the reduction quantities in the City's CAP and are considered less than significant for GHG emissions.

Therefore, with the implementation of the CCAP Screening Tables, the Project is not expected to generate GHG emissions, either directly or indirectly, that would cause a significant impact on the environment.

Also, by complying with the CCAP, the Project will not conflict with an applicable plan, policy or regulation for the purpose of reducing the emissions of greenhouse gases and the impact is considered less than significant.

Furthermore, since the purpose of the City's CCAP is to ensure compliance with the state's climate initiatives for reducing GHG emissions, by complying with the CCAP, the Project will also be in compliant with the broader statewide goals for combating climate change; such as those required in the CARB Scoping Plan and AB 32.

The mixed-use Project is also located within close proximity to high quality transit, located in a low VMT zone, and offers high-density residential development near commercial uses. The Project will include pedestrian friendly and walkable design that will encourage fewer auto-based trips. The following Project design features will be provided to further help reduce GHG emissions:

GHG-DF-11 Comply with the mandatory requirements of California Building Standards Code Title 24 Part 6 (Energy Code) and Title 24 Part 11 (CAL Green).

GHG-DF-12 Implement water conservation strategies, including low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and limit the amount of turf/sod, per CAL Green and City of Ontario requirements.

GHG-DF-13 Implement zero waste strategies, recycling and composting programs for residential and non-residential uses.

GHG-DF-14 Encourage residents and landscape maintenance crews to use electric landscaping equipment, such as lawn mowers and leaf blowers, wherever feasible.

GHG-DF-15 No natural gas or wood burning fireplaces shall be installed in any residential dwelling.

GHG-DF-16 Implement trip reduction measures that reduce the number of auto-based trips and encourage the use of transit, bicycling, and walking. Such as;

1. Improve the walkability and design of the project by including pedestrian and bicycling connections within the project site and to adjacent off-site facilities (i.e., sidewalks, crosswalks, foot paths, protected bike lanes, multi-purpose trails, direct parcel-to-parcel connections, wayfinding signage, etc.).
2. Provide traffic calming measures (i.e., marked crosswalks, raised crosswalks, raised intersections, count-down signal timers, curb extensions, speed tables, median islands, tight corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, etc.)
3. Provide bicycle racks for the retail and commercial uses and secure bicycle parking areas for the office and residential uses.

GHG-DF-17 Provide electric vehicle charging stations per the requirements of CALGreen.

The Project is anticipated to have a less than significant impact. Additionally, with implementation of the Project DF, the Project would continue to have a less than significant impact on GHG.

9. HAZARDS & HAZARDOUS MATERIALS

Would the project:

a) Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?

Discussion of Effects: The Project is not anticipated to involve the transport, use or disposal of hazardous materials during either construction or Project implementation. Typical construction activities involve the use and handling of solvents, paints, and other chemicals. However, none of the proposed uses involve the use or handling of dangerous chemicals that could create a significant hazard to the public or the environment. Additionally, the Project site have been previously graded, and no hazardous materials exist onsite. Therefore, no adverse impacts are anticipated. However, in the unlikely event of an accident, implementation of the strategies included in The Ontario Plan would decrease the potential for health and safety risks from hazardous materials to a less than significant impact.

Mitigation: None required.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Discussion of Effects: The proposed Project does not include the use of hazardous materials or volatile fuels. In addition, there are no known stationary commercial or industrial land uses within close proximity to the subject site, which use/store hazardous materials to the extent that they would pose a significant hazard to visitors/occupants to the subject site, in the event of an upset condition resulting in the release of a hazardous material. No impacts are anticipated.

Mitigation: None required

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school?

Discussion of Effects: The proposed Project does not include the use, emissions or handling of hazardous or acutely hazardous materials, substances or waste. Therefore, no impacts are anticipated.

Mitigation: None required.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Discussion of Effects: The proposed Project site is not listed on the hazardous materials site compiled pursuant to Government Code Section 65962.5. Therefore, the Project would not create a hazard to the public or the environment and no impact is anticipated.

Mitigation: None required.

e) For a project located within the safety zone of the airport land use compatibility plan for ONT or Chino Airports, would the project result in a safety hazard for people residing or working in the project area?

Discussion of Effects: According to Land Use Element (Exhibit LU-06 Airport Environs) of the General Plan, the Project site is located within the airport land use plan. However, the Project would not result in a safety hazard for people working or residing in the Project area because it would not obstruct aircraft maneuvering because of the Project's low elevation and the architectural style of the Project. Additionally, the Land Use Compatibility Guidelines for Noise Impacts (Table LU-08) shows the proposed use as normally accepted in the 65 CNEL. The proposed use would comply with standards for mitigating noise. Therefore, no impacts are anticipated.

Mitigation: None required.

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

Discussion of Effects: The Project site is not located within the vicinity of a private airstrip. Therefore, no impacts are anticipated.

Mitigation: None required.

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Discussion of Effects: The City's Safety Element, as contained within The Ontario Plan, includes policies and procedures to be administered in the event of a disaster. The Ontario Plan seeks interdepartmental and inter-jurisdictional coordination and collaboration to be prepared for, respond to, and recover from everyday and disaster emergencies. In addition, the Project would comply with the requirements of the Ontario Fire Department and all City requirements for fire and other emergency access. Because the Project is required to comply with all applicable City codes, any impacts would be reduced to a less than significant level.

Mitigation: None required.

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Discussion of Effects: The Project site is not located in or near wildlands. Therefore, no impacts are anticipated.

Mitigation: None required.

10. HYDROLOGY & WATER QUALITY

Would the project:

a) Violate any other water quality standards or waste discharge requirements or potential for discharge of storm water pollutants from areas of material storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas or loading docks, or other outdoor work areas?

Discussion of Effects: The Project site is served by City water and sewer service and would not affect water quality standards or waste discharge requirements. Discharge of storm water pollutants from areas of

materials storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing, waste handling, hazardous materials handling or storage, delivery areas or loading docks, or other outdoor work) areas could result in a temporary increase in the amount of suspended solids, trash and debris, oil and grease, organic compounds, pesticides, nutrients, heavy metals and bacteria pathogens in surface flows during a concurrent storm event, thus resulting in surface water quality impacts. The site is required to comply with the statewide National Pollutant Discharge Elimination System (NPDES) General Industrial Activities Stormwater Permit, the San Bernardino County Area-Wide Urban Runoff Permit (MS4 permit) and the City of Ontario's Municipal Code (Title 6, Chapter 6 (Stormwater Drainage System)). In addition to the NPDES, MS4, and other permits listed in this section, this site is required to comply with the latest trash capture requirements from the State and RWQCB. This would reduce any impacts to below a level of significance. However, as part of the Certified EIR, the following Mitigation Measures (MMs) were imposed as part of the development of the OCSP:

Mitigation: Hydrology

MM-HYD-1 On-site drainage plans will be designed, submitted to, and approved by the City of Ontario prior to the issuance of a grading permit.

MM-HYD-2 Proposed storm drainage facilities to be installed as The Ontario Center develops, will be placed in public streets. W here storm drains must be placed in areas other than public streets, a drainage easement will be dedicated as needed.

MM-HYD-3 Some modification will be necessary to existing drainage facilities. No existing facility will be removed without replacement by another structure to serve the particular condition.

MM-HYD-4 As development proceeds, there will be a need for temporary siltation basins to reduce sedimentation from construction activities. These will be located in specific areas of construction and sized in accordance with City of Ontario criteria.

With implementation of the applicable Certified EIR MMs, the Project would have a less than significant impact.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Discussion of Effects: No increases in the current amount of water flow to the Project site are anticipated, and the proposed Project would not deplete groundwater supplies, nor will it interfere with recharge. The water use associated with the proposed use of the property would be negligible. The development of the site would require the grading of the site and excavation is expected to be less than three feet and would not affect the existing aquifer, estimated to be about 230 to 250 feet below the ground surface. No adverse impacts are anticipated.

Mitigation: None required.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site or volume of storm water runoff to cause environmental

harm or potential for significant increases in erosion of the project site or surrounding areas?

Discussion of Effects: It is not anticipated that the Project would alter the drainage pattern of the site or area, in a manner that would result in erosion, siltation or flooding on-or-off site nor would the proposed Project increase the erosion of the subject site or surrounding areas. The existing drainage pattern of the Project site would not be altered, and it would have no significant impact on downstream hydrology. Stormwater generated by the Project would be discharged in compliance with the statewide NPDES General Construction Activities Stormwater Permit and San Bernardino County MS4 permit requirements. With the full implementation of a Storm Water Pollution Prevention Plan (SWPPP) developed in compliance with the General Construction Activities Permit requirements, the BMPs included in the SWPPP, and a stormwater monitoring program would reduce any impacts to below a level of significance. No streams or streambeds are present on the site. No changes in erosion off-site are anticipated.

Mitigation: None required.

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site or potential for significant changes in the flow velocity or volume of storm water runoff to cause environmental harm?

Discussion of Effects: The proposed Project is not anticipated to increase the flow velocity or volume of storm water runoff to cause environmental harm from the site and would not create a burden on existing infrastructure. Furthermore, with the implementation of an approved Water Quality Management Plan (WQMP) developed for the site, in compliance with the San Bernardino County MS4 Permit requirements, stormwater runoff volume shall be reduced to below a level of significance.

Mitigation: None required.

e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff (a&b) during construction and/or post-construction activity?

Discussion of Effects: It is not anticipated that the Project would create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or create or contribute stormwater runoff pollutants during construction and/or post-construction activity. Pursuant to the requirements of The Ontario Plan, the City's Development Code, and the San Bernardino County MS4 Permit's WQMP, individual developments must provide site drainage and WQMP plans according to guidelines established by the City's Engineering Department. If master drainage facilities are not in place at the time of Project development, then standard engineering practices for controlling post-development runoff may be required, which could include the construction of on-site storm water detention and/or retention/infiltration facilities. Therefore, no impacts are anticipated.

Mitigation: None required.

f) Otherwise substantially degrade water quality or potential for discharge of storm water to affect the beneficial uses of receiving water?

Discussion of Effects: Activities associated with the construction period, could result in a temporary increase in the amount of suspended solids in surface flows during a concurrent storm event, thus resulting in surface water quality impacts. The site is required to comply with the statewide NPDES General Construction Permit and the City of Ontario's Municipal Code (Title 6, Chapter 6 (Stormwater Drainage System)) to minimize water pollution. Thus, it is anticipated that there is no potential for discharges of stormwater during construction that would affect the beneficial uses of the receiving waters. However, with the General Construction Permit requirement and implementation of the policies in The Ontario Plan, any impacts associated with the Project would be less than significant. However, as part of the Certified EIR, the following MMs were imposed as part of the development of the OCSP:

Mitigation: Water Quality

MM-WQ-1 During construction, a variety of temporary structural measures such as velocity dissipators, siltation fences or basins and. vegetative buffer zones will be used to reduce siltation and sedimentation runoff from construction sites.

MM-WQ-2 Periodic cleaning of storm drains and inlets, construction of pervious pavement surfaces in areas designated by the City, periodic street sweeping.

MM-WQ-3 Periodic street sweeping will be conducted by the City of Ontario for streets dedicated to the City. Periodic vacuum sweeping will be conducted by the owners of individual sites.

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

Discussion of Effects: The project site is not located within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map. Therefore, no impacts are anticipated.

Mitigation: None required.

h) Place within a 100-year flood hazard area, structures that would impede or redirect flood flows?

Discussion of Effects: As identified in the Safety Element (Exhibit S-2) of the Policy Plan (General Plan), the site lies outside of the 100-year flood hazard area. Therefore, no adverse impacts are anticipated.

Mitigation: None required.

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

Discussion of Effects: As identified in the Safety Element (Exhibit S-2) of The Ontario Plan, the site lies outside of the 100-year flood hazard area. No levees or dams are located near the Project site. Therefore, no adverse impacts are anticipated.

Mitigation: None required.

j) Expose people or structures to inundation by seiche, tsunami or mudflow?

Discussion of Effects: There are no lakes or substantial reservoirs near the project site; therefore, impacts from seiche are not anticipated. The City of Ontario has relatively flat topography, less than two percent across the City, and the chance of mudflow is remote. Therefore, no impacts are anticipated.

Mitigation: None required.

11. LAND USE & PLANNING

Would the project:

a) Physically divide an established community?

Discussion of Effects: The Project site is located in an area that is currently developed with urban land uses. This Project would be of similar design and size to surrounding development. The Project would become a part of the larger commercial, entertainment retail, office, and high-density residential communities, which surround the Project site. No adverse impacts are anticipated.

Mitigation: None required.

b) Conflict with applicable land use plan, policy or regulation of agencies with jurisdiction over the project (including, but not limited to general plan, airport land use compatibility plan, specific plan, or development code) adopted for the purpose of avoiding or mitigation an environmental effect?

Discussion of Effects: The proposed Project is consistent with The Ontario Plan and does not interfere with any policies for environmental protection. As such, no impacts are anticipated.

Mitigation: None required.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

Discussion of Effects: There are no adopted habitat conservation plans in the Project area. As such no conflicts or impacts are anticipated.

Mitigation: None required.

12. MINERAL RESOURCES

Would the project:

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

Discussion of Effects: The Project site is located within a mostly developed area surrounded by urban land uses. There are no known mineral resources in the area. Therefore, no impacts are anticipated.

Mitigation: None required.

b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

Discussion of Effects: There are no known mineral resources in the area. No impacts are anticipated.

Mitigation: None required.

13. NOISE

Would the project result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Discussion of Effects: As noted in Section 3.5.8, Noise, and as shown in Tables 3-8 and 3-9, the Project would not expose people to or generate noise levels in excess of standards as established in The Ontario Plan FEIR (Section 5.12). No additional analysis would be required at the time of site development review.

Mitigation: None required.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Discussion of Effects: The uses associated with this Project normally do not induce groundborne vibrations. As such, no impacts are anticipated. Typical construction vibration is shown on Tables 3-10 and 3-11 which conclude that Project vibration would not expose persons or generate excessive groundborne vibration or noise levels.

Mitigation: None required.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Discussion of Effects: The Project would not be a significant permanent noise generator and would not cause a substantial permanent increase in ambient noise levels because of the limited size and scope of the Project. Moreover, the proposed use would be required to operate within the noise levels permitted for commercial development, pursuant to City of Ontario Development Code. The Project would create typical construction noise as shown in Tables 3-8 and 3-9. Therefore, no increases in noise levels within the vicinity of the project are anticipated.

Mitigation: None required.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Discussion of Effects: Temporary construction activities would minimally impact ambient noise levels. All construction machinery would be maintained according to industry standards to help minimize the impacts. Normal activities associated with the Project are unlikely to increase ambient noise levels. As shown in Tables 3-12, 3-13, and 3-14 show that the Project would not create substantial temporary or periodic increase in ambient noise. A less than significant impact is anticipated.

Mitigation: None required.

e) For a project located within the noise impact zones of the airport land use compatibility plan for ONT and Chino Airports, would the project expose people residing or working in the project area to excessive noise levels?

Discussion of Effects: According to the Safety Element in The Ontario Plan and the Noise Impact Analysis, the proposed site is located within the airport land use plan. However, the Project is located outside of

the 60 CNEL noise contour. Therefore, the exterior noise impact from the airport would be within the allowable limits for residential land uses and the Project is considered compatible with the surrounding land use and noise environment. Noise from airport operations is expected to generate a less than significant on the proposed Project.

Mitigation: None required.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

Discussion of Effects: The Project site is not located within the vicinity of a private airstrip. Therefore, no impacts are anticipated.

Mitigation: None required.

14. POPULATION & HOUSING

Would the project:

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of road or other infrastructure)?

Discussion of Effects: The Project is located in a developed area and would not induce population growth as the proposed multi-family DUs have been previously analyzed as part of the OCSP development in the Certified EIR and population growth as part of the OCSP has already been assumed and accounted for in the General Plan and regionally. Therefore, no impacts are anticipated

Mitigation: None required.

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

Discussion of Effects: The Project site is currently undeveloped. Therefore, no impacts are anticipated.

Mitigation: None required.

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

Discussion of Effects: The Project site is currently undeveloped. Therefore, no impacts are anticipated.

Mitigation: None required.

15. PUBLIC SERVICES

Would the project:

a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

i) Fire protection?

Discussion of Effects: The site is in a developed area currently served by the Ontario Fire Department. As previously noted, the site has already been accounted for in the General Plan that it will be developed to include a greater amount of commercial SF and a larger amount of multi-family DUs. The Project would not require the construction of any new facilities or alteration of any existing facilities or cause a decline in the levels of service, which could cause the need to construct new facilities. No impacts are anticipated. However, as part of the development of the OCSP, the Certified EIR noted that the following MMs would be applicable to the development of the OCSP:

Mitigation: Fire Protection

MM-PS-1 The developer will pay a fair share of "in-lieu" fees to subsidize additional facilities and equipment as mutually agreed upon by both the developer and the City of Ontario.

MM-PS-2 All new development will participate in updating the City of Ontario Water Master Plan and will contribute on a "fair share" basis toward implementation of Master Plan programs.

MM-PS-3 Ontario Fire Department and project developer Will provide, in writing, assurance of water supply adequacy from local water purveyor.

MM-PS-4 Design features at the site plan level will reduce risk of fire hazard. Site plan proposals will be reviewed during site plan review by Ontario Fire Department (OFD). Protection measures recommended by the OFD will be implemented by project proponent.

With implementation of MMs PS-1 through PS-4, a less than significant impact on fire services would occur.

ii) Police protection?

Discussion of Effects: The site is in a developed area, currently served by the Ontario Police Department. The Project would not require the construction of any new facilities or alteration of any existing facilities or cause a decline in the levels of service, which could cause the need to construct new facilities and no impact are anticipated on police protection services. However, as part of the development of the OCSP, the Certified EIR noted that the following MMs would be applicable to the development of the OCSP:

Mitigation: Law Enforcement

MM-PS-5 If a proposed ordinance is adopted, the regional center builder/developer may be required to pay a one-time developer assessment fee to the Police Department at the time of issuance of a building permit. This developer fee will mitigate the fiscal impact incurred by the Police Department.

Due to the projected increase in police calls for service to be generated by the development. The amount of this fee will be established by the Ontario Police Department based on land use and projected calls-for-service from that use.

MM-PS-6 Each individual project within The Ontario Center will incorporate on-site security measures. These measures will be reviewed by the Ontario Police Department. They will include, but not be limited to, limited-height landscaping, exterior lighting, security hardware.

MM-PS-7 In addition to these physical security and lighting requirements, the Police Department requests that the developer submit a plan delineating which functions are to be addressed by on-site private security and what functions are to be served by the Police Department. This

plan may include personnel selection and training and physical security measures, i.e., video surveillance, emergency call boxes, communication and alarms. This plan shall be approved by the Police Department prior to implementation.

With implementation of MMs PS-5 through PS-7, a less than significant impact on police services would occur.

iii) Schools?

Discussion of Effects: The Project would be required to pay school fees as prescribed by state law prior to the issuance of building permits. However, as part of the development of the OCSP, the Certified EIR noted that the following MMs would be applicable to the development of the OCSP:

Mitigation: School

MM-PS-8 Developers of residential projects within The Ontario Center will pay required school impact mitigation fees of $29,000 gross acre to Cucamonga School District per agreement reached between the District and the developer dated December 31, 1986.

MM-PS-9 Developers of projects within The Ontario Center will pay fees, as noted below, to the Chaffey Joint Unified School District:

Residential $.48/square foot

Commercial/Industrial/Office $.08/square foot

iv) Parks?

Discussion of Effects: The site is in a developed area, currently served by the City of Ontario. The Project would not require the construction of any new facilities or alteration of any existing facilities or cause a decline in the levels of service, which could cause the need to construct new facilities. However, as part of the development of the OCSP, the Certified EIR noted that the following MMs would be applicable to the development of the OCSP:

Mitigation: Parks and Recreation

MM-PS-10 Regional Parks: The responsibility for rehabilitating existing regional parks and/or building new facilities, rests with the County of San Bernardino Parks Department. A Draft Ordinance has been prepared by the County Parks Department which will require developers to pay fees for future parks and open space. Developers within The Ontario Center shall comply with the City of Ontario's implementation of the County's fee ordinance for the collection of development fees for regional parks, trails, and open space if and when it is enacted.

MM-PS-11 Local Parks: A Park Development Fund Fee of $802/single family detached unit and $700/multiple family unit will be paid at the time of issuance of building permits.

MM-PS-12 Private recreational opportunities shall be encouraged for the commercial retail/industrial use areas.

v) Other public facilities?

Discussion of Effects: The site is in a developed area, currently served by the City of Ontario. The Project would not require the construction of any new facilities or alteration of any existing facilities or cause a decline in the levels of service, which could cause the need to construct new facilities. No impacts are anticipated.

Mitigation: None required.

16. RECREATION

Would the project:

a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that have an adverse physical effect on the environment?

Discussion of Effects: This Project is not proposing any significant new housing or large employment generator that would cause an increase in the use of neighborhood parks or other recreational facilities that have not already been analyzed as part of the OCSP or the Certified EIR and/or considered in the General Plan. Implementation of the proposed Project would not require the construction of neighborhood parks or other recreational facilities. No impacts are anticipated.

Mitigation: None required.

17. TRANSPORTATION/TRAFFIC

Would the project:

A Project-specific Traffic Impact Analysis was prepared by RK Engineering Group. The results are provided herein, and the technical study is included as Appendix A of this Addendum.

a) Conflict with a program plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?

Discussion of Effects: The Project is in an area that is mostly developed with all street improvements existing. As noted in Table 3-3, the number of vehicle trips per day is forecast at 5,691 daily trips or 5.4 percent compared to the allowable 105,332 daily trips allowable per the OCSP for the site. Therefore, as noted in Section 3.5.5, Traffic and Circulation, the Project would not create a substantial increase in the number of vehicle trips, traffic volume or congestion at intersections and would not conflict with an applicable plan, ordinance, or policy addressing the circulation system, transit, roadway, bicycle, or pedestrian facilities. Less than significant impacts are anticipated. However, as part of the Certified EIR, the following MMs were imposed as part of the development of the OCSP:

Mitigation: Traffic and Transportation

MM-TRF-1 Buildout in the project vicinity of the proposed circulation system defined in the Specific Plan Amendment will occur.

MM-TRF-2 Development and implementation of a Transportation Systems Management (TSM) program with a goal of a ten percent reduction in peak hour trips will occur as defined the Specific Plan Amendment.

MM-TRF-3 Applicants for all future specific plans and specific plan amendments in the vicinity of The Ontario Center project will be required to complete traffic impact and mitigation studies to ensure that the forty (40) intersections studied this EIR will not exceed an intersection capacity utilization greater than Level of Service E.

With implementation of the applicable Certified EIR MMs, the Project would have a less than significant impact.

b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

Discussion of Effects: As noted in Section 3.5.5.1, CEQA Vehicle Miles Traveled, the Project is found to have a less than significant impact regarding VMT.

Mitigation: None required.

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

Discussion of Effects: The Project would not create a substantial safety risk or interfere with air traffic patterns at Ontario International Airport as it either is outside of areas with FAA-imposed height restrictions or is under such height restrictions. No impacts are anticipated.

Mitigation: None required.

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Discussion of Effects: The Project is in an area that is mostly developed. All street improvements are complete, and no alterations are proposed for adjacent intersections or arterials. The Project would, therefore, not create a substantial increase in hazards due to a design feature. No impacts are anticipated.

Mitigation: None required.

e) Result in inadequate emergency access?

Discussion of Effects: The Project would be designed to provide access for all emergency vehicles and would therefore not create an inadequate emergency access. No impacts are anticipated.

Mitigation: None required.

18. TRIBAL CULTURAL RESOURCES

Would the project:

a) Cause a substantial adverse change in the significance of a Tribal Cultural Resource as defined in Public Resources Code Section 21074?

Discussion of Effects: The proposed Project is in an area that has been previously disturbed by development. No known Tribal Cultural Resource sites exist within the Project area. Thus, tribal artifacts are not expected to be encountered during any excavation, grading, or construction activities.

Mitigation: None required.

19. UTILITIES AND SERVICE SYSTEMS

Would the project:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Discussion of Effects: The proposed Project is served by the City of Ontario sewer system, which has waste treated by the Inland Empire Utilities Agency at the RP-1 and/or RP-5 treatment plant. The Project is required to meet the requirements of the Ontario Engineering Department regarding wastewater. Additionally, as noted in Section 2.3, Land Use and Development, the proposed Project would implement a Project at a much lower development intensity than the originally approved project under the OCSP and the Certified EIR. As such, no impacts are anticipated.

Mitigation: None required.

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Discussion of Effects: The proposed Project is served by the City of Ontario sewer system and which has waste treated by the Inland Empire Utilities Agency at the RP-1 and/or RP-5 treatment plant. RP-1 and/or RP-5 is not at capacity and this Project would not cause RP-1 and/or RP-5 to exceed capacity. The Project would, therefore, not require the construction of new wastewater treatment facilities, or the expansion of existing facilities. No impacts are anticipated.

Mitigation: None required.

c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Discussion of Effects: The proposed Project is served by the City of Ontario. The Project is required to meet the requirements of the Ontario Engineering Department regarding storm drain facilities. Because the Project is much less intense than the previously approved project on the same footprint, no impacts are anticipated.

Mitigation: None required.

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed? In making this determination, the City shall consider whether the project is subject to the water supply assessment requirements of Water Code Section 10910, et seq. (SB 610), and the requirements of Government Code Section 664737 (SB 221).

Discussion of Effects: The Project is served by the City of Ontario water system. There is currently a sufficient water supply available to the City of Ontario to serve this project. Additionally, as noted in Table 2-4, the Project is anticipated to require 316,027 GPD compared to the 727,888 GPD of the originally approved project and analyzed under Certified EIR. The proposed Project would require approximately 54 percent of the originally accounted for water demand. Although a less than significant impact is anticipated in this regard, the Certified EIR included the following MMs as part of the original OCSP analysis.

Mitigation: Water Supply

MM-UTL-1 All existing and future users will share in costs of supplemental city-wide water supply system.

MM-UTL-2 Reclaimed water, as it is available from CBMWD Regional Plant No. 4, will be used for open space irrigation when economically feasible.

MM-UTL-3 Cooperation between CBMWD, the City of Ontario, developers of The Ontario Center and other landowners will be necessary to ensure adequate capacity.

A less than significant impact would occur with implementation of MMs UTL-1 through UTL-3.

e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Discussion of Effects: The proposed Project is served by the City of Ontario sewer system, which has waste treated by the Inland Empire Utilities Agency at the RP-1 and/or RP-5 treatment plant. RP-1 and/or RP-5 is not at capacity and this project would not cause RP-1 and/or RP-5 to exceed capacity. Although no impact is anticipated in this regard, the Certified EIR included the following MMs as part of the original OCSP analysis.

Mitigation: Wastewater

MM-UTL-4 Design and construction of wastewater collection facilities within the Ontario Center will be completed under the jurisdiction of the City of Ontario.

MM-UTL-5 Any plans for use of the non-reclaim able waste line (NRW) system will be made known to the City and CBMWD.

MM-UTL-6 Wastewater collection facilities will be designed so that all parcels can be served by gravity mains without pumping.

MM-UTL-7 The Ontario Center project development will coordinate construction activities with the City of Ontario and CBMWD to assure adequate interceptor, trunk sewer and treatment plant capacity is available as development proceeds.

MM-UTL-8 Continued coordination between CBMWD, the City, developers of The Ontario Center, and other property owners/developers will occur to assure adequate capacity is available in the Cucamonga Interceptor as development occurs within the tributary area.

A less than significant impact would occur with implementation of MMs UTL-4 through UTL-8.

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Discussion of Effects: City of Ontario serves the proposed Project. Currently, the City of Ontario contracts with a waste disposal company that transports trash to a landfill with sufficient capacity to handle the City's solid waste disposal needs. No impacts are anticipated. Although no impact is anticipated in this regard, the Certified EIR included the following MM as part of the original OCSP analysis.

Mitigation: Solid Waste

MM-UTL-9 Solid waste will be disposed of in Milliken Landfill. Upon closing of the Milliken Landfill, waste will be disposed of at the San Timoteo Landfill. A transfer station for the City will be constructed by the City in the next 2 to 3 years to transport waste from Ontario to the San Timoteo Landfill.

A less than significant impact would occur with implementation of MM UTL-9.

g) Comply with federal, state, and local statutes and regulations related to solid waste?

Discussion of Effects: This Project would comply with federal, state, and local statutes and regulations regarding solid waste. Therefore, no impacts are anticipated.

Mitigation: None required.

20. Wildfire

Would the project:

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

Discussion of Effects: According to the General Plan and CAL FIRE, the Project site is not located within a Very High, High, or Medium Fire Hazard area. The Project would not interfere with the City's Emergency Management Plan because it does not contain any features that would prohibit the execution of such plans. The Project would maintain the existing ingress and egress which were designed to accommodate existing and future growth of the site. No impacts are anticipated.

Mitigation: None required.

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

Discussion of Effects: Like most of southern California, the City of Ontario faces a diverse array of potential natural hazards. The General Plan notes that severe windstorms can pose a significant risk to property and life in the region by creating conditions that disrupt essential systems such as public utilities, telecommunications, and transportation routes. High winds, including Santa Ana winds, can cause damage to homes, businesses, landscaping, public property, and utilities, and pose threats to public safety, including accelerating a fire. The alluvial sand that underlies the majority of Ontario is generally granular, poorly consolidated, and very susceptible to erosion. In strong winds this sand can impact property, air quality and visibility. However, no special circumstances occur on the Project that do not occur in the rest of the City of region. No impact from wind hazards is anticipated to occur.

Mitigation: None required.

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

Discussion of Effects: All proposed Project components would be within the Project site property lines, and impacts associated with the development of the Project within this footprint area analyzed throughout this document and has been previously analyzed in the Certified EIR. No impacts are anticipated to occur.

Mitigation: None required.

d) Expose people or structures to significant risks, including downslope, or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

Discussion of Effects: As previously analyzed in the Certified EIR, the Project site is not located in a landslide hazard area or a floodplain. No changes in findings in this regard would occur compared to those findings in the Certified EIR for the Project site. As such, no impact in this regard would occur.

Mitigation: None required.

21. MANDATORY FINDINGS OF SIGNIFICANCE

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat or a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Discussion of Effects: The site is located within an area that has been previously heavily disturbed, mass graded, and partially developed with various uses including multi-family residential DUs and commercial. The Project is not anticipated to have the potential to degrade the quality of the environment or reduce the overall habitat as there is no native habitat.

b) Does the project have the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals?

Discussion of Effects: The Project does not have the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals. As shown throughout this addendum, the Project would not cause any more intense impacts than those already previously considered in the Certified EIR, CEA, POCA, and POOC environmental documents.

Mitigation: None required.

c) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current project, and the effects of probable future projects.)

Discussion of Effects: The Project does not have impacts that are cumulatively considerable that have not already been considered in the Certified EIR, CEA, POCA, and POOC environmental documents.

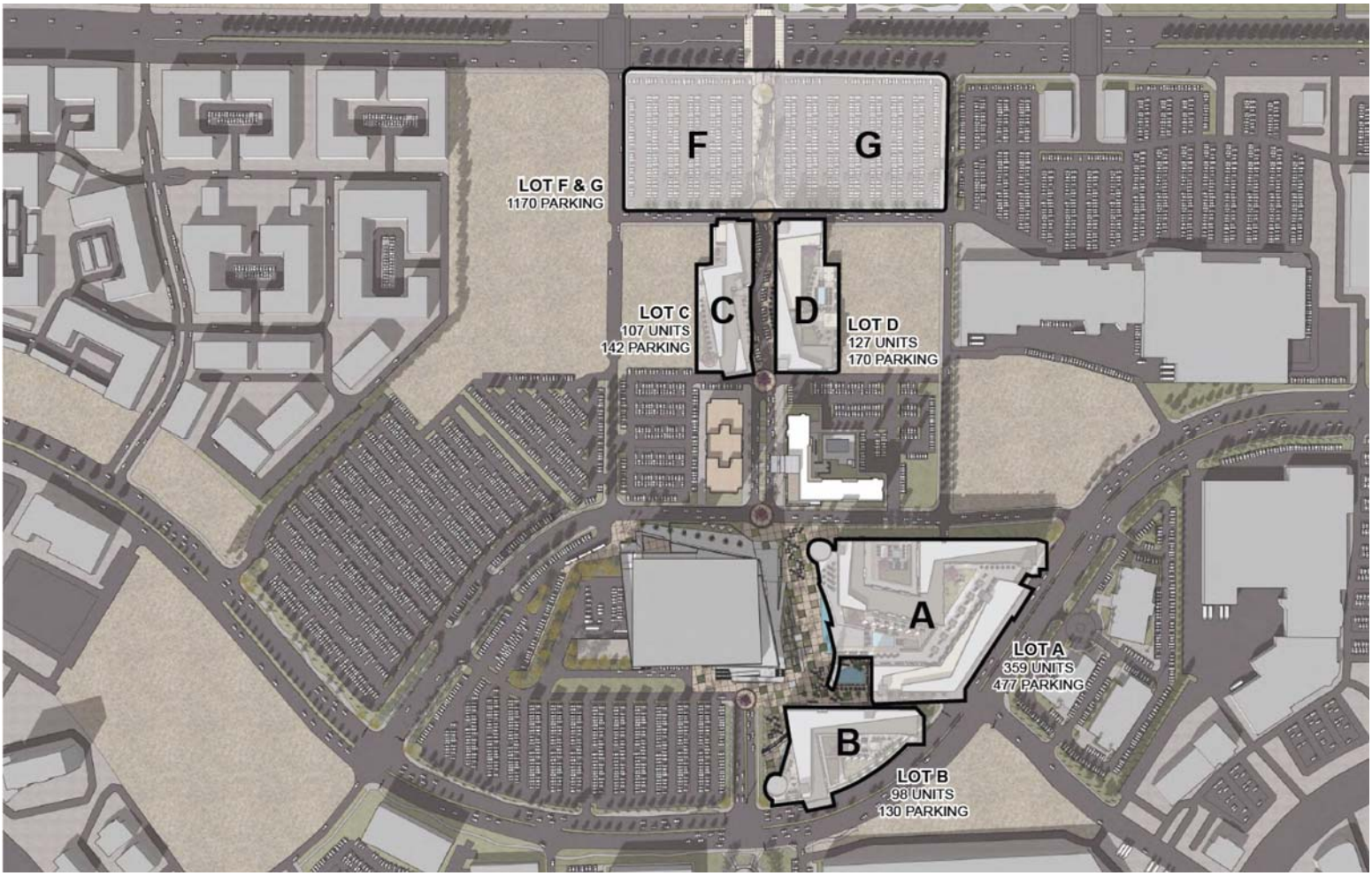
Mitigation: None required.

d) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?

Discussion of Effects: The Project does not have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly.

Mitigation: None required.

TOYOTA ARENA MIXED-USE DEVELOPMENT
AIR QUALITY AND GREENHOUSE GAS IMPACT STUDY
City of Ontario



TOYOTA ARENA MIXED-USE DEVELOPMENT
AIR QUALITY AND GREENHOUSE GAS IMPACT STUDY
City of Ontario, California

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1.0 Introduction

The purpose of this air quality and greenhouse gas (GHG) impact study is to determine whether the estimated criteria air pollutants and greenhouse gas emissions generated from the construction and operation of the proposed Toyota Arena Mixed-Use Development (hereinafter referred to as project) would cause significant impacts to air resources.

This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.). The methodology follows the California Air Resources Board (CARB), the South Coast Air Quality Management District (SCAQMD), and City of Ontario recommendations for quantification of emissions and evaluation of potential impacts.

1.1 Site Location

The proposed project site is located adjacent to the Toyota Arena, north of Concourse Street and south of Fourth Street, in the City of Ontario.

The project site is located within the South Coast Air Basin (SCAB), the SCAQMD San Bernardino Valley General Forecast Area, and the Southwest San Bernardino Valley Air Monitoring Area-33.

The project site is located within the Ontario Center Specific Plan and zoned for Urban Commercial use. The City of Ontario General Plan land use map designates the project site as Mixed Use.

The project location map is provided in Exhibit A.

1.2 Project Description

The project consists of construction and operation of a mixed use town center development with residential and commercial/retail land use within four development lots.

The proposed project includes a total of 691 residential dwelling units, 71,200 square feet of commercial/retail uses and the demolition and relocation of approximately 1,170 surface parking spaces. The total project site area is approximately 18.73 acres.

The site plan used for this analysis, provided by the applicant, is illustrated in Exhibit B. Table 1 summarizes the land use assumptions used for this analysis.

Table 1
Land Use Summary

Lot	Dwelling Units	Retail (SF)[1]	Parking Spaces
A	359	25,256	477[2]
B	98	20,802	130[2]
C	107	11,047	142[2]
D	127	14,095	170[2]
E & F	--	--	1,170
Total	691	71,200	2,089

[1] S.F. – Square Feet
[2] Parking Structure

Construction of the project is estimated to begin in the year 2021 and last approximately 21 months. Construction activities are expected to consist of demolition, site preparation, grading, building construction, paving, and architectural coating. The project is expected to demolish an existing asphalt surface parking lot of approximately 7.48 acres within Lot A and Lot B.

The project is not expected to require the import or export of earthwork materials; preliminary grading estimates show a balanced site. The project is expected to be operational in the year 2023.

1.3 Sensitive Receptors

Sensitive receptors are considered land uses or other types of population groups that are more sensitive to air pollution exposure. Sensitive population groups include children, the elderly, the acutely and chronically ill, and those with cardio-respiratory diseases. For CEQA purposes, the SCAQMD considers a sensitive receptor to be a location where a sensitive individual could remain for 24-hours or longer, such as residences, hospitals, and schools (etc), as described in the Localized Significance Threshold Methodology (SCAQMD 2008a, page 3-2).

The nearest sensitive land uses to the project site include the following:

- Existing residential dwelling units located approximately 150 feet north of Lot G, across Fourth Street.

- Existing residential dwelling units located approximately 475 feet to the west of Lot F.

1.4 Summary of Air Quality and Greenhouse Gas Impacts

Table 2 provides a summary of the CEQA air quality impact analysis results.

Table 2
CEQA Air Quality Impact Criteria

Air Quality Impact Criteria	Potentially Significant	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with, or obstruct implementation of, the applicable air quality plan?			**X**	
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable Federal or State ambient air quality standard?			X	
d) Expose sensitive receptors to substantial pollutant concentrations?			**X**	
e) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?			**X**	

Table 3 provides a summary of the CEQA GHG impact criteria analysis results.

Table 3
CEQA GHG Impact Criteria

GHG Impact Criteria	Potentially Significant	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of greenhouse gases?			X	

1.5 Recommended Design Features

This section provides a summary of the recommended design features that are expected to be included as part of the project description and design and have been identified to help reduce the project's impact from air quality and GHG emissions. The recommended project design features include several standard rules and requirements, best practices, and common project design features for reducing air quality emissions.

Construction Design Features:

DF-1 Prepare and implement a Construction Management Plan which will include Best Available Control Measures to be submitted to the City of Ontario.

DF-2 Follow the standard SCAQMD rules and requirements with regards to fugitive dust control, which includes, but are not limited to the following:

1. All active construction areas shall be watered two (2) times daily.
2. Speed on unpaved roads shall be reduced to less than 15 mph.
3. Any visible dirt deposition on any public roadway shall be swept or washed at the site access points within 30 minutes.
4. Any on-site stockpiles of debris, dirt or other dusty material shall be covered or watered twice daily.
5. All operations on any unpaved surface shall be suspended if winds exceed 15 mph.
6. Access points shall be washed or swept daily.
7. Construction sites shall be sandbagged for erosion control.

8. Apply nontoxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for 10 days or more).
9. Cover all trucks hauling dirt, sand, soil, or other loose materials, and maintain at least 2 feet of freeboard space in accordance with the requirements of California Vehicle Code (CVC) section 23114.
10. Pave or gravel construction access roads at least 100 feet onto the site from the main road and use gravel aprons at truck exits.
11. Replace the ground cover of disturbed areas as quickly possible.
12. A fugitive dust control plan should be prepared and submitted to SCAQMD prior to the start of construction.

DF-3 All diesel construction equipment shall have Tier 4 low emission "clean diesel" engines (OEM or retrofit) that include diesel oxidation catalysts and diesel particulate filters that meet the latest CARB best available control technology.

DF-4 Construction equipment shall be maintained in proper tune.

DF-5 All construction vehicles shall be prohibited from excessive idling. Excessive idling is defined as five (5) minutes or longer.

DF-6 Minimize the simultaneous operation of multiple construction equipment units.

DF-7 The use of heavy construction equipment and earthmoving activity shall be suspended during Air Alerts when the Air Quality Index reaches the "Unhealthy" level.

DF-8 Establish an electricity supply to the construction site and use electric powered equipment instead of diesel-powered equipment or generators, where feasible.

DF-9 Utilize zero VOC and low VOC paints and solvents, wherever possible.

Operational Design Features:

DF-10 Implement the GHG Reduction Measures from the Ontario County Climate Action Plan (CAP) Screening Tables to achieve at least 100 points, per the requirements for Mixed Use Projects.

DF-11 Comply with the mandatory requirements of California Building Standards Code Title 24 Part 6 (Energy Code) and Title 24 Part 11 (CAL Green).

DF-12 Implement water conservation strategies, including low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and limit the amount of turf/sod, per CAL Green and City of Ontario requirements.

DF-13 Implement zero waste strategies, recycling and composting programs for residential and non-residential uses.

DF-14 Encourage residents and landscape maintenance crews to use electric landscaping equipment, such as lawn mowers and leaf blowers, wherever feasible.

DF-15 No natural gas or wood burning fireplaces shall be installed in any residential dwelling.

DF-16 Implement trip reduction measures that reduce the number of auto-based trips and encourage the use of transit, bicycling, and walking. Such as;

1. Improve the walkability and design of the project by including pedestrian and bicycling connections within the project site and to adjacent off-site facilities (i.e. sidewalks, crosswalks, foot paths, protected bike lanes, multi-purpose trails, direct parcel-to-parcel connections, wayfinding signage, etc.).

2. Provide traffic calming measures (i.e. marked crosswalks, raised crosswalks, raised intersections, count-down signal timers, curb extensions, speed tables, median islands, tight corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, etc.)

3. Provide bicycle racks for the retail and commercial uses and secure bicycle parking areas for the office and residential uses.

DF-17 Provide electric vehicle charging stations per the requirements of CALGreen.

2.0 Air Quality Setting

The Federal Clean Air Act (§ 7602) defines air pollution as any agent or combination of such agents, including any physical, chemical, biological, or radioactive substance which is emitted into or otherwise enters the ambient air. Household combustion devices, motor vehicles, industrial facilities and forest fires are common sources of air pollution. Air pollution can cause disease, allergies and even death. It affects soil, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility, and climate. It can also cause damage to and deterioration of property, present hazards to transportation, and negatively impact the economy.

This section provides background information on criteria air pollutants, the applicable federal, state and local regulations concerning air pollution, and the existing physical setting of the project within the context of local air quality.

2.1 Description of Air Pollutants[1].

The following section describes the air pollutants of concern related to the project. Criteria air pollutants are defined as those pollutants for which the federal and state governments have established air quality standards for outdoor or ambient concentrations to protect public health. The following descriptions of criteria air pollutants have been provided by the SCAQMD.

- **Carbon Monoxide (CO)** is a colorless, odorless, toxic gas produced by incomplete combustion of carbon-containing fuels (e.g., gasoline, diesel fuel, and biomass). Sources include motor vehicle exhaust, industrial processes (metals processing and chemical manufacturing), residential wood burning, and natural sources. CO is somewhat soluble in water; therefore, rainfall and fog can suppress CO conditions. CO enters the body through the lungs, dissolves in the blood, and competes with oxygen, often replacing it in the blood, thus reducing the blood's ability to transport oxygen to vital organs in the body. The ambient air quality standard for carbon monoxide is intended to protect persons whose medical condition already compromises their circulatory system's ability to deliver oxygen. These medical conditions include certain heart ailments, chronic lung diseases, and anemia. Persons with these conditions have reduced exercise capacity even when exposed to relatively low levels of CO. Fetuses are at risk because their blood has an even greater affinity to bind with CO. Smokers are also at risk from ambient CO levels because smoking

[1] SCAQMD. Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning (May 6, 2005)

increases the background level of CO in their blood. The South Coast basin has recently achieved attainment status for carbon monoxide by both USEPA and CARB.

- **Nitrogen Dioxide (NO_2)** is a byproduct of fuel combustion. The principal form of nitrogen oxide produced by combustion is nitric oxide (NO), but NO reacts quickly to form NO_2, creating the mixture of NO and NO_2 commonly called NO_x. NO_2 acts as an acute irritant and, in equal concentrations, is more injurious than NO. At atmospheric concentrations, however, NO_2 is only potentially irritating. There is some indication of a relationship between NO_2 and chronic pulmonary fibrosis. Some increase in bronchitis in young children has also been observed at concentrations below 0.3 parts per million (ppm). NO_2 absorbs blue light which results in a brownish red cast to the atmosphere and reduced visibility. Although NO_2 concentrations have not exceeded national standards since 1991 and the state hourly standard since 1993, NO_x emissions remain of concern because of their contribution to the formation of O_3 and particulate matter.

- **Ozone (O_3)** is one of several substances called photochemical oxidants that are formed when volatile organic compounds (VOC) and NO_x react in the presence of ultraviolet sunlight. O_3 concentrations in the South Coast basin are typically among the highest in the nation, and the damaging effects of photochemical smog, which is a popular name for a number of oxidants in combination, are generally related to the concentrations of O_3. Individuals exercising outdoors, children, and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the subgroups most susceptible to O_3 effects. Short-term exposures (lasting for a few hours) to O_3 at levels typically observed in southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. In recent years, a correlation between elevated ambient O_3 levels and increases in daily hospital admission rates, as well as mortality, has also been reported. The South Coast Air Basin is designated by the USEPA as an extreme non-attainment area for ozone. Although O_3 concentrations have declined substantially since the early 1990s, the South Coast basin continues to have peak O_3 levels that exceed both state and federal standards.

- **Fine Particulate Matter (PM_{10})** consists of extremely small, suspended particles or droplets 10 microns or smaller in diameter that can lodge in the lungs, contributing to respiratory problems. PM_{10} arises from such sources as re-entrained road dust, diesel soot, combustion products, tire and brake abrasion, construction operations, and fires. It is also formed in the atmosphere from NO_x and SO_2 reactions with ammonia. PM_{10} scatters light and significantly reduces visibility. Inhalable particulates

pose a serious health hazard, alone or in combination with other pollutants. More than half of the smallest particles inhaled will be deposited in the lungs and can cause permanent lung damage. Inhalable particulates can also have a damaging effect on health by interfering with the body's mechanism for clearing the respiratory tract or by acting as a carrier of an absorbed toxic substance. The South Coast basin has recently achieved federal attainment status for PM_{10}, but is non-attainment based on state requirements.

- **Ultra-Fine Particulate Matter ($PM_{2.5}$)** is defined as particulate matter with a diameter less than 2.5 microns and is a subset of PM_{10}. $PM_{2.5}$ consists mostly of products from the reaction of NO_x and SO_2 with ammonia, secondary organics, finer dust particles, and the combustion of fuels, including diesel soot. $PM_{2.5}$ can cause exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease, declines in pulmonary function growth in children, and increased risk of premature death from heart or lung diseases in the elderly. Daily fluctuations in $PM_{2.5}$ levels have been related to hospital admissions for acute respiratory conditions, school absences, and increased medication use in children and adults with asthma. The South Coast basin is designated as non-attainment for $PM_{2.5}$ by both federal and state standards.

- **Sulfur dioxide (SO_2)** is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. Health effects include acute respiratory symptoms and difficulty in breathing for children. Individuals with asthma may experience constriction of airways with exposure to SO_2. Though SO_2 concentrations have been reduced to levels well below state and federal standards, further reductions in SO_2 emissions are needed because SO_2 is a precursor to sulfate and PM_{10}. The South Coast basin is considered a SO_2 attainment area by USEPA and CARB.

- **Lead (Pb)** is a toxic heavy metal that can be emitted into the air through some industrial processes, burning of leaded gasoline and past use of lead-based consumer products. Lead is a neurotoxin that accumulates in soft tissues and bones, damages the nervous system, and causes blood disorders. It is particularly problematic in children, in that permanent brain damage may result, even if blood levels are promptly normalized with treatment. Concentrations of lead once exceeded the state and federal air quality standards by a wide margin, but as a result of the removal of lead from motor vehicle gasoline, ambient air quality standards for lead have not been exceeded since 1982. Though special monitoring sites immediately downwind of lead sources recorded localized violations of the state standard in 1994, no violations have been recorded since. Consequently, the South Coast basin is designated as an attainment area for lead by both the USEPA and CARB. This report

does not analyze lead emissions from the project, as it is not expected to emit lead in any significant measurable quantity.

- **Volatile Organic Compounds (VOC),** although not actually a criteria air pollutant, VOCs are regulated by the SCAQMD because they cause chemical reactions which contribute to the formation of ozone. VOCs are also transformed into organic aerosols in the atmosphere, contributing to higher PM_{10} and lower visibility levels. Sources of VOCs include combustion engines, and evaporative emissions associated with fuel, paints and solvents, asphalt paving, and the use of household consumer products such as aerosols. Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations of VOC. Some hydrocarbon components classified as VOC emissions are hazardous air pollutants. Benzene, for example, is a hydrocarbon component of VOC emissions that are known to be a human carcinogen. The term reactive organic gases (ROG) are often used interchangeably with VOC.

- **Toxic Air Contaminants (TACs)** are defined as air pollutants which may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health, and for which there is no concentration that does not present some risk. This contrasts with the criteria pollutants, in that there is no threshold level for TAC exposure below which adverse health impacts are not expected to occur. The majority of the estimated health risk from TACs can be attributed to a relatively few compounds, the most common being diesel particulate matter (DPM) from diesel engine exhaust. In addition to DPM, benzene and 1,3-butadiene are also significant contributors to overall ambient public health risk in California.

2.2 Federal and State Ambient Air Quality Standards

The Federal Clean Air Act, which was last amended in 1990, requires the EPA to set National Ambient Air Quality Standards (NAAQS) for criteria pollutants considered harmful to public health and the environment. The State of California has also established additional and more stringent California Ambient Air Quality Standards (CAAQS) in addition to the seven criteria pollutants designated by the federal government.

AAQS are designed to protect the health and welfare of the populace with a reasonable margin of safety. The standards are divided into two categories, primary standards, and secondary standards. Primary standards are implemented to provide protection for the "sensitive" populations such as those with asthma, or the children and elderly. Secondary standards are to provide protection against visible pollution as well as damage to the surrounding environment, including animals, crops, and buildings.

Table 4 shows the Federal and State Ambient Air Quality Standards.

Table 4
Federal and State Ambient Air Quality Standards (AAQS)[1]

Air Pollutant	Averaging Time [2]	Federal Standard (NAAQS)[2]	California Standard (CAAQS)[2]
Ozone	1 Hour	--	0.09 ppm
	8 Hour	0.070 ppm	0.070 ppm
Carbon Monoxide (CO)	1 Hour	35 ppm	20 ppm
	8 Hour	9 ppm	9 ppm
Nitrogen Dioxide (NO_2)	1 Hour	0.100 ppm	0.18 ppm
	Annual	0.053 ppm	0.030 ppm
Sulfur Dioxide (SO_2)	1 Hour	0.075 ppm	0.25 ppm
	3 Hour	0.5 ppm[3]	--
	24 Hour	--	0.04 ppm
Particulate Matter (PM_{10})	24 Hour	150 $\mu g/m^3$	50 $\mu g/m^3$
	Mean	--	20 $\mu g/m^3$
Particulate Matter (PM2.5)	24 Hour	35 $\mu g/m^3$	--
	Annual	12 $\mu g/m^3$	12 $\mu g/m^3$
Lead	30-day	--	1.5 $\mu g/m$
	Quarter	1.5 $\mu g/m$	--
	3-month average	0.15 $\mu g/m$	--
Visibility reducing particles	8 Hour	--	0.23/km extinction coefficient. (10-mile visibility standard)
Sulfates	24 Hour	--	25 $\mu g/m$
Vinyl chloride	24 Hour	--	0.01 ppm
Hydrogen sulfide	24 Hour	--	0.03 ppm

[1] Source: USEPA: https://www.epa.gov/criteria-air-pollutants/naaqs-table and
CARB: https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards

[2] ppm = parts per million of air, by volume; µg/m3 = micrograms per cubic meter; Annual = Annual Arithmetic Mean; 30-day = 30-day average; Quarter = Calendar quarter.

[3] Secondary standards

Several pollutants listed in Table 4 are not addressed in this analysis. Lead is not included because the project is not anticipated to emit lead. Visibility-reducing particles are not explicitly addressed in this analysis because particulate matter is addressed. The project is not expected to generate or be exposed to vinyl chloride because proposed project uses do not utilize the chemical processes that create this pollutant and there are no such uses in the project vicinity. The proposed project is not expected to cause exposure to hydrogen sulfide because it would not generate hydrogen sulfide in any substantial quantity.

2.3 Attainment Status

The Clean Air Act requires states to prepare a State Implementation Plan (SIP) to ensure air quality meets the NAAQS. The California Air Resources Board (CARB) provides designations of attainment for air basins where AAQS are either met or exceeded. If the AAQS are met, the area is designated as being in "attainment", if the air pollutant concentrations exceed the AAQS, than the area is designated as being "nonattainment". If there is inadequate or inconclusive data to make a definitive attainment designation, the area is considered "unclassified."

National nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards. Each standard has a different definition, or 'form' of what constitutes attainment, based on specific air quality statistics. For example, the Federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the federal annual $PM_{2.5}$ standard is met if the three-year average of the annual average $PM_{2.5}$ concentration is less than or equal to the standard.

When a state submits a request to the EPA to re-designate a nonattainment area to attainment, the Clean Air Act (CAA) section 175A(a) requires that the state (or states, if the area is a multi-state area) submit a maintenance plan ensuring the area can maintain the air quality standard for which the area is to be re-designated for at least 10 years following the effective date of re-designation.

Table 5 lists the attainment status for the criteria pollutants in the South Coast Air Basin (SCAB).

Table 5
South Coast Air Basin Attainment Status[1]

Pollutant	State Status	National Status
Ozone	Nonattainment	Nonattainment (Extreme)[2]
Carbon monoxide	Attainment	Attainment (Maintenance)
Nitrogen dioxide	Attainment	Attainment (Maintenance)
PM_{10}	Nonattainment	Attainment (Maintenance)
$PM_{2.5}$	Nonattainment	Nonattainment
Lead	Attainment	Nonattainment (Partial)[3]

[1] Source: California Air Resources Board. http://www.arb.ca.gov/desig/adm/adm.htm
[2] 8-Hour Ozone.
[3] Partial Nonattainment designation – Los Angeles County portion of Basin only.

2.4 South Coast Air Quality Management District (SCAQMD)

The agency responsible for air pollution control for the South Coast Air Basin (SCAB) is the South Coast Air Quality Management District (SCAQMD). SCAQMD is responsible for controlling emissions primarily from stationary sources. SCAQMD maintains air quality monitoring stations throughout the SCAB. SCAQMD, in coordination with the Southern California Association of Governments, is also responsible for developing, updating, and implementing the Air Quality Management Plan (AQMP) for the SCAB. An AQMP is a plan prepared and implemented by an air pollution district for a county or region designated as nonattainment of the federal and/or California ambient air quality standards. The term nonattainment area is used to refer to an air SCAB where one or more ambient air quality standards are exceeded.

The latest version is the 2016 AQMP. The 2016 AQMP is a regional blueprint for achieving the federal air quality standards and healthful air. While air quality has dramatically improved over the years, the SCAB still exceeds federal public health standards for both ozone and particulate matter (PM) and experiences some of the worst air pollution in the nation. The 2016 AQMP includes both stationary and mobile source strategies to ensure that rapidly approaching attainment deadlines are met, that public health is protected to the maximum extent feasible, and that the region is not faced with burdensome sanctions if the Plan is not approved or if the NAAQS are not met on time.

According to the 2016 AQMP, the most significant air quality challenge in the SCAB is to reduce nitrogen oxide (NOx) emissions sufficiently to meet the upcoming ozone standard deadlines. Based on the inventory and modeling results, 522 tons per day (tpd) of total

SCAB NOx 2012 emissions are projected to drop to 255 tpd and 214 tpd in the 8-hour ozone attainment years of 2023 and 2031 respectively, due to continued implementation of already adopted regulatory actions ("baseline emissions"). The analysis suggests that total SCAB emissions of NOx must be reduced to approximately 141 tpd in 2023 and 96 tpd in 2031 to attain the 8-hour ozone standards. This represents an additional 45 percent reduction in NOx in 2023, and an additional 55 percent NOx reduction beyond 2031 levels.[2]

2.4.1 SCAQMD Rules and Regulations

The SCAQMD establishes a program of rules and regulations to obtain attainment of the state and federal standards in conjunction with the AQMP. Several of the rules and regulations that may be applicable to this project include, but are not limited to, the following:

- **SCAQMD Rule 402** prohibits a person from discharging from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

- **SCAQMD Rule 403** governs emissions of fugitive dust during construction and operation activities. Compliance with this rule is achieved through application of standard Best Management Practices, such as application of water or chemical stabilizers to disturbed soils, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 miles per hour, sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph, and establishing a permanent ground cover on finished sites.

- **SCAQMD Rule 445** restricts wood burning devices from being installed into any new development and is intended to reduce the emissions of particulate matter for wood burning devices.

- **SCAQMD Rule 1113** governs the sale, use, and manufacturing of architectural coating and limits the VOC content in paints and paint solvents. This rule regulates the VOC content of paints available during construction. Therefore, all paints and

[2] SCAQMD. Final 2016 Air Quality Management Plan. http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp

solvents used during construction and operation of project must comply with Rule 1113.

- **SCAQMD Rule 1143** governs the manufacture, sale, and use of paint thinners and solvents used in thinning of coating materials, cleaning of coating application equipment, and other solvent cleaning operations by limiting their VOC content. This rule regulates the VOC content of solvents used during construction. Solvents used during the construction phase must comply with this rule.

- **SCAQMD Rule 1186** limits the presence of fugitive dust on paved and unpaved roads and sets certification protocols and requirements for street sweepers that are under contract to provide sweeping services to any federal, state, county, agency or special district such as water, air, sanitation, transit, or school district.

2.5 Local Climate and Meteorology

The project is located in the South Coast Air Basin (SCAB). Climatological data from the nearest weather station to the project site is summarized in Table 6.

Table 6
Meteorological Summary[1]

Month	Temperature (˚F)			Mean Precipitation (inches)
	Max.	Min.	Mean	
January	66.8	44.0	55.5	3.65
February	69.4	45.0	57.2	2.85
March	70.1	46.3	58.2	2.80
April	74.5	48.4	61.5	1.13
May	79.9	52.6	66.2	0.26
June	86.7	56.6	71.7	0.04
July	95.0	62.2	78.6	0.01
August	94.4	62.9	78.7	0.11
September	91.3	61.3	76.3	0.34
October	83.0	55.4	69.2	0.34
November	73.6	48.5	61.0	1.72
December	68.3	44.4	56.3	2.07
Annual	**79.4**	**52.3**	**65.9**	**15.32**

[1] Source: Western Regional Climate Center 2012. Averages derived from measurements recorded from 1951 to 1984 at Fontana Kaiser Station No. 043120.

2.6 Local Air Quality

The air quality at any site is dependent on the regional air quality and local pollutant sources. Regional air quality is determined by the release of pollutants throughout the air basin. Estimates of the existing emissions in the Basin provided in the Final 2016 Air Quality Management Plan, prepared by SCAQMD, March 2017, indicate that collectively, mobile sources account for 60 percent of the VOC, 90 percent of the NOx emissions, 95 percent of the CO emissions and 34 percent of directly emitted PM2.5, with another 13 percent of PM2.5 from road dust.

The SCAQMD has divided the SCAB into fourteen general forecasting areas and thirty eight Source Receptor Areas (SRA) for monitoring and reporting local air quality. The SCAQMD provides daily reports of the current air quality conditions in each general forecast area and SRA. The monitoring areas provide a general representation of the local meteorological, terrain, and air quality conditions within the SCAB.

The project is located within the San Bernardino Valley general forecasting area and Southwest San Bernardino Valley (SRA-33). The Southwest San Bernardino Valley has been divided into two (2) regions; I-10 Near Road and CA-60 Near Road. Due to the close proximity of the project site to the I-10 Road, published air quality monitoring data has been used from this location.

Table 7 summarizes the published air quality monitoring for the most recent 3-year period available. These pollutant levels were used to comprise a "background" for the project location and existing local air quality. For criteria pollutants not monitored near the site, data from the nearest monitoring station with a comparable setting were used.

Table 7
Local Air Quality

Air Pollutant Location	Averaging Time	Item	2017	2018	2019
Carbon Monoxide -- I-10 Near Road	1 Hour	Max 1-Hour (ppm)	4.2	1.6	1.5
		Exceeded State Standard (20 ppm)	No	No	No
		Exceeded National Standard (35 ppm)	No	No	No
	8 Hour	Max 8 Hour (ppm)	1.3	1.3	1.1
		Exceeded State Standard (9 ppm)	No	No	No
		Exceeded National Standard (9 ppm)	No	No	No
Ozone -- Central San Bernardino Valley-1	1 Hour	Max 1-Hour (ppm)	0.137	0.141	0.124
		Days > State Standard (0.09 ppm)	33	38	41
	8 Hour	Max 8 Hour (ppm)	0.118	0.116	0.114
		Days > State Standard (0.07 ppm)	49	69	67
		Days >National Standard (0.070 ppm)	49	69	67
Nitrogen Dioxide -- I-10 Near Road	1 Hour	Max 1-Hour (ppm)	0.086	0.0883	0.0863
		Exceeded State Standard (0.18 ppm)	No	No	No
	Annual	Annual Average (ppm)	0.0288	0.0272	0.0276
		Exceeded >State Standard (0.030 ppm)	No	No	No
		Exceeded >National Standard (0.053 ppm)	No	No	No
Sulfur Dioxide -- Central San Bernardino Valley-1	1 Hour	Max 1 Hour (ppm)	0.0039	0.0029	0.0024
		Exceed State Standard (0.25 ppm)	No	No	No
		Exceed National Standard (0.075 ppm)	No	No	No
Coarse Particles (PM10) -- Central San Bernardino Valley-1	24 Hour	Max 24-Hour ($\mu g/m^3$)	75	64	88
		Days > State Standard (50 $\mu g/m^3$)	2	9	12
		Days >National Standard (150 $\mu g/m^3$)	0	0	0
	Annual	Annual Average ($\mu g/m^3$)	39.3	34.1	34.8
		Exceeded State Standard (20 $\mu g/m^3$)	Yes	Yes	Yes
Fine Particulates (PM2.5) -- Central San Bernardino Valley-1	24 Hour	Max 24-Hour ($\mu g/m^3$)	39.2	29.2	46.5
		Days >National Standard (35 $\mu g/m^3$)	1	0	2
	Annual	Annual Average ($\mu g/m^3$)	12.04	11.13	10.84
		Exceeded State Standard (12 $\mu g/m^3$)	No	No	No
		Exceeded National Standard (15 $\mu g/m^3$)	No	No	No

Source : https://www.aqmd.gov/home/air-quality/historical-air-quality-data/historical-data-by-year
$\mu g/m^3$ = micrograms per cubic meter
ARB = California Air Resource Board
EPA= Environmental Protection Agency
ppm = part per million
(- -) = Data not provided

3.0 Global Climate Change Setting

Global climate change is the change in the average weather of the earth that is measured by such things as alterations in temperature, wind patterns, storms, and precipitation. Current data shows that the recent period of warming is occurring more rapidly than past geological events. The average global surface temperature has increased by approximately 1.4° Fahrenheit since the early 20th Century. 1.4° Fahrenheit may seem like a small change, but it's an unusual event in Earth's recent history, and as we are seeing, even small changes in temperature can cause enormous changes in the environment.

The planet's climate record, preserved in tree rings, ice cores, and coral reefs, shows that the global average temperature has been stable over long periods of time. For example, at the end of the last ice age, when the Northeast United States was covered by more than 3,000 feet of ice, average global temperatures were only 5° to 9° Fahrenheit cooler than today. The Intergovernmental Panel on Climate Change (IPCC), which includes more than 1,300 scientists from the United States and other countries, forecasts a temperature rise of 2.5° to 10° Fahrenheit over the next century. Therefore, significant changes to the environment are expected in the near future.

The consequences of global climate change include more frequent and severe weather, worsening air pollution by increasing ground level ozone, higher rates of plant and animal extinction, more acidic and oxygen depleted oceans, strain on food and water resources, and threats to densely populated coastal and low lying areas from sea level rise.

The impacts of climate change are already visible in the Southwest United States. In California, the consequences of climate change include;

- A rise in sea levels resulting in the displacement of coastal businesses and residencies
- A reduction in the quality and supply of water from the Sierra snowpack
- Increased risk of large wildfires
- Exacerbation of air quality problems
- Reductions in the quality and quantity of agricultural products
- An increased temperature and extreme weather events
- A decrease in the health and productivity of California's forests

3.1 Greenhouse Gases

GHGs comprise less than 0.1 percent of the total atmospheric composition, yet they play an essential role in influencing climate. Greenhouse gases include naturally occurring compounds such as carbon dioxide (CO_2), methane (CH_4), water vapor (H_2O), and nitrous oxide (N_2O), while others are synthetic. Man-made GHGs include the chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs) and Perfluorocarbons (PFCs), as well as sulfur hexafluoride (SF_6). Different GHGs have different effects on the Earth's warming. GHGs differ from each other in their ability to absorb energy (their "radiative efficiency") and how long they stay in the atmosphere, also known as the "lifetime".

The Global Warming Potential (GWP) was developed to allow comparisons of the global warming impacts of different gases. Specifically, it is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of CO_2. The larger the GWP, the more that a given gas warms the Earth compared to CO_2 over that time period. The time period usually used for GWPs is 100 years. GWPs provide a common unit of measure, which allows analysts to add up emissions estimates of different gases and allows policymakers to compare emissions reduction opportunities across sectors and gases.

Table 8 lists the 100-year GWP of GHGs from the Intergovernmental Panel on Climate Change (IPCC) fifth assessment report (AR5).

Table 8
Global Warming Potential of Greenhouse Gases[1, 2]

Gas Name	Formula	Lifetime (years)	GWP
Carbon Dioxide	CO_2		1
Methane	CH_4	12	28
Nitrous Oxide	N_2O	114	265
Sulphur Hexafluoride	SF_6	3200	23,500
Nitrogen Trifluoride	NF_3	740	16,100
Hexafluoroethane (PFC-116)	C_2F_6	10,000	11,100
Octafluoropropane (PFC-218)	C_3F_8	2,600	8,900
Octafluorocyclobutane (PFC-318)	C_4F_8	3,200	9,540
Tetrafluoromethane (PFC-14)	CF_4	50,000	6,630
Hydrofluorocarbon 125	HFC-125	29	3,170
Hydrofluorocarbon 134a	HFC-134a	14	1,300
Hydrofluorocarbon 143a	HFC-143a	52	4,800
Hydrofluorocarbon 152a	HFC-152a	1	138
Hydrofluorocarbon 227ea	HFC-227ea	34	3,350
Hydrofluorocarbon 23	HFC-23	270	12,400
Hydrofluorocarbon 236fa	HFC-236fa	240	8,060
Hydrofluorocarbon 245fa	HFC-245fa	8	858
Hydrofluorocarbon 32	HFC-32	5	677
Hydrofluorocarbon 365mfc	HFC-365mfc	9	804
Hydrofluorocarbon 43-10mee	HFC-43-10mee	16	1,650

[1] Source: IPCC Fifth Assessment Report (AR5)
https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter08_FINAL.pdf
[2] GWPs are used to convert GHG emission values to "carbon dioxide equivalent" (CO_2e) units

3.2 GHG Regulatory Setting – State of California

The State of California has been a leader in climate change legislation and has passed numerous bills to reduce greenhouse gas emissions across all sectors of the economy. Some of the key climate legislation in the State include the following:

- **Assembly Bill (AB) 32, California Global Warming Solutions Act of 2006.** AB 32 set the stage for the State's transition to a sustainable, low-carbon future. AB 32 was the first program in the country to take a comprehensive, long-term approach to addressing climate change.[3]

- **Senate Bill (SB) 375, Sustainable Communities & Climate Protection Act of 2008.** SB 375 requires the Air Resources Board to develop regional greenhouse gas emission reduction targets for passenger vehicles GHG reduction targets for 2020 and 2035 for each region covered by the State's 18 metropolitan planning organizations.[4]

- **Senate Bill (SB) 100, California Renewables Portfolio Standard Program.** SB 100 established a landmark policy requiring renewable energy and zero-carbon resources supply 100 percent of electric retail sales to end-use customers by 2045.[5]

3.3 GHG Emissions Inventory

Table 9 shows the latest GHG emission inventories at the national, state, regional and local levels.

Table 9
GHG Emissions Inventory[1]

United States (2018)[2]	State of California (2018)[3]	SCAG (2020)[4]	City of Ontario (2020)[5]
6,678 $MMTCO_2e$	425 $MMTCO_2e$	216.4 $MMTCO_2e$	3.12 $MMTCO_2e$

[1] $MMTCO_2e$ = Million Metric Tons of Carbon Dioxide Equivalent
[2] https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks
[3] https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2018/ghg_inventory_trends_00-18.pdf
[4] http://www.scag.ca.gov/programs/Pages/GreenhouseGases.aspx
[5] City of Ontario Community Climate Action Plan, November 2014. Estimated value.

[3] California Air Resources Board. AB 32 Global Warming Solutions Act of 2006. https://ww2.arb.ca.gov/resources/fact-sheets/ab-32-global-warming-solutions-act-2006
[4] California Air Resources Board. Sustainable Communities and Climate Protection Program. https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-climate-protection-program/about
[5] California Energy Commission. SB 100 Joint Agency Report. https://www.energy.ca.gov/sb100

4.0 Modeling Parameters and Assumptions

The California Emissions Estimator Model Version 2020.4.0 (CalEEMod) was used to calculate criteria air pollutants and GHG emissions from the construction and operation of the project. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify criteria air pollutant and GHG emissions.

The model quantifies direct emissions from construction and operation activities (including vehicle use), as well as indirect emissions, such as GHG emissions from off-site energy generation, solid waste disposal, vegetation planting and/or removal, and water use. The model also identifies design features to reduce criteria pollutant and GHG emissions. The model was developed for the California Air Pollution Control Officers Association (CAPCOA) in collaboration with the California air districts.

4.1 Construction Assumptions

Construction of the project is estimated to begin in the year 2021 and last approximately 21 months. Construction activities are expected to consist of demolition, site preparation, grading, building construction, paving, and architectural coating. The project is expected to be operational in the year 2023. For purposes of this analysis, construction phases are not expected to overlap.

The project is expected to demolish an existing asphalt surface parking lot of approximately 7.48 acres within Lot A and Lot B. The project is not expected to require the import or export any earthwork material during grading phase; preliminary earthwork estimates show a balanced site.

Assumptions for off-road equipment usage, soil disturbance area, worker and vendor trips, paving, and architectural coatings utilize the CalEEMod defaults.

The project will be required to comply with several standard fugitive dust control measures, per SCAQMD Rule 403. The following key inputs are utilized in CalEEMod and are based upon data provided from SCAQMD[6]:

- Utilize soil stabilizers - 30% PM_{10} and $PM_{2.5}$ reduction.

[6] SCAQMD. Fugitive Dust Mitigation Measures. http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/mitigation-measures-and-control-efficiencies/fugitive-dust

- Replace ground cover - 15% PM_{10} and $PM_{2.5}$ reduction.
- Water exposed areas 2x per day.
- Unpaved road moisture content – 25%.
- Unpaved road vehicle speed – 15 mph.

4.2 Operational Assumptions

Operational emissions occur over the life of the project and are considered "long-term" sources of emissions. Operational emissions include both direct and indirect sources. This section briefly describes the operational sources of emissions analyzed for the project.

4.2.1 Mobile Source Emissions

Mobile source emissions are the largest source of long-term air pollutants from the operation of the project. Mobile sources are direct sources of project emissions that are primarily attributed to tailpipe exhaust and road dust (tire, brake, clutch, and road surface wear) from motor vehicles traveling to and from the site.

Estimates of mobile source emissions require information on four parameters: trip generation, trip length, vehicle/fleet mix, and emission factors (quantity of emission for each mile traveled or time spent idling by each vehicle).

The trip generation rates, trip length and trip percentages for this project are based on the latest version of the Toyota Arena Mixed Use Development Traffic Impact Study Scoping Agreement, by RK, May 2021 and San Bernardino County Transportation Authority (SBCTA) VMT Tool[7].

The Emission Factors (EMFAC2017) 2017 model and off-model adjustments factors to account for the SAFE Vehicle Rule is used to estimate the mobile source emissions are embedded in the CalEEMod emissions model. No adjustments have been made to default emission factors.

The project's total vehicle miles traveled estimated by CalEEMod is shown in the Table 10 for this project.

[7] SBCTA VMT Screening Tool. https://devapps.fehrandpeers.com/sbctavmt/

Table 10
Operational Vehicle Miles Traveled

Land Use	Annual Vehicle Miles Traveled (VMT)
Multifamily Mid-Rise[1]	5,682,657
Commercial/Retail Center	4,539,098
Total	**10,221,754**

[1] The VMT estimates for residential home-based trips are based on estimates from the SBCTA VMT Tool, which shows daily home-based VMT per capita for TAZ 53690101 of 7.9 VMT per population for model year 2023.

The operational vehicle fleet mix has been adjusted to reflect vehicle types used for typical residential home-based trips and the commercial/retail and office trips generated by the project. The Southern California Association of Governments (SCAG) regional travel demand model does not include heavy-duty trucks, buses or other large vehicles that would require passenger car equivalent (PCE) adjustments for residential home-based trips. The project does not consist of land uses that would typically require PCE adjustments to account for large trucks, such as warehousing.

To be conservative, the Air Quality/GHG analysis has assumed that 2% of the total residential home-based trips and commercial/retail and office trips will include trucks with a gross vehicle weight rating (GVWR) of 10,000 pound or greater. This includes LHD2, MHD, HHD, OBUS, UBUS, and SBUS vehicles. The 2% mix is also consistent with the default Highway Capacity Manual (HCM) assumptions. The adjusted vehicle mix is proportioned according to the default CalEEMod vehicle mix.

Table 11 summarizes vehicle mix used for this project.

Table 11
Vehicle Mix for Trips[1]

YUY	Vehicle Mix (%)
Light Duty Automobile (LDA)	55.05%
Light Duty Truck (LDTI)	5.72%
Light Duty Truck (LDT2)	17.64%
Medium Duty Truck (MDV)	14.23%
Light Heavy Truck (LHD1)	2.76%
Light Heavy Truck (LHD2)	0.34%
Medium Heavy Truck (MHD)	0.53%
Heavy Heavy Truck (HHD)	0.81%
Other Bus (OBUS)	0.03%
Urban Bus (UBUS)	0.01%
Motorcycle (MCY)	2.59%
School Bus (SBUS)	0.04%
Motor Home (MH)	0.24%
Total	**100.0%**

[1] Adjusted fleet mix to include 2% total trucks over 10,000 lbs GVWR. (LHD2, MHD, HHD, OBUS, UBUS, SBUS, MH)

5.0 Significance Thresholds

5.1 Air Quality Regional Significance Thresholds

The SCAQMD has established air quality emissions thresholds for criteria air pollutants for the purposes of determining whether a project may have a significant effect on the environment per Section 15002(g) of the Guidelines for implementing CEQA. By complying with the thresholds of significance, the project would be in compliance with the SCAQMD Air Quality Management Plan (AQMP) and the federal and state air quality standards.

Table 12 lists the air quality significance thresholds for the six air pollutants analyzed in this report. Lead is not included as part of this analysis as the project is not expected to emit lead in any significant measurable quantity.

Table 12
SCAQMD Regional Significance Air Quality Thresholds

Pollutant	Construction (lbs/day)	Operation (lbs/day)
NO_X	100	55
VOC	75	55
PM_{10}	150	150
$PM_{2.5}$	55	55
SO_X	150	150
CO	550	550

[1] Source: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf

5.2 City of Ontario General Plan

The City of Ontario describes several goals and policies for addressing air quality and greenhouse gas in the General Plan ER4 Air Quality. The following policy goals are aimed at providing guidance and policy direction in providing better indoor and outdoor air quality for Ontario and the air basin will improve the quality of life of residents, workers and visitors, decrease health care costs and make Ontario more prosperous by making the City a more desirable place to be.

GOAL ER4: Improved indoor and outdoor air quality and reduced locally generated pollutant emissions

ER4-1 *Land Use.* We reduce GHG and other local pollutant emissions through compact, mixed use, and transit-oriented development and development that improves the regional jobs-housing balance.

ER4-2 *Sensitive Land Uses.* We prohibit the future siting of sensitive land uses, within the distances defined by the California Air Resources Board for specific source categories, without sufficient mitigation.

ER4-3 *Greenhouse Gases (GHG) Emissions Reductions.* We will reduce GHG emissions in accordance with regional, state and federal regulations.

ER4-4 *Indoor Air Quality.* We will comply with State Green Building Codes relative to indoor air quality.

ER4-5 *Transportation.* We promote mass transit and non-motorized mobility options (e.g. walking, biking) to reduce air pollutant emissions.

ER4-6 Particulate Matter. We support efforts to reduce particulate matter to meet State and Federal Clean Air Standards.

ER4-7 *Other Agency Collaboration.* We collaborate with other agencies within the South Coast Air Basin to improve regional air quality at the emission source.

5.4 City of Ontario Community Climate Action Plan

The City of Ontario has adopted the Community Climate Action Plan (CCAP) to help reduce citywide GHG emissions and align the City with the statewide Scoping Plan GHG reduction efforts.

The CCAP has established Screening Tables, which are setup similar to a checklist, with points allocated to certain elements of the project that would contribute to reduced GHG emissions. If a project garners 100 points (by including enough GHG reducing elements), then the project is consistent with Ontario City's Community Climate Action Plan for reducing emissions and the impact may be considered less than significant for purposes of CEQA.

6.0 Air Quality Impact Analysis

Consistent with CEQA and the State CEQA Guidelines, a significant impact related to air quality would occur if the proposed project is determined to:

a) Conflict with or obstruct implementation of the applicable air quality plan.

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable Federal or State ambient air quality standard.

c) Expose sensitive receptors to substantial pollutant concentrations.

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

6.1 Short Term Air Quality Impacts - Construction

6.1.1 Daily Emissions - Construction

Daily air quality emissions include both on-site and off-site emissions associated with construction of the project. Regional daily emissions of criteria pollutants are compared to the SCAQMD thresholds of significance.

As shown in Table 13, daily emissions of criteria pollutants are expected to be below the allowable thresholds of significance.

CalEEMod daily emissions outputs are provided in Appendix A.

Table 13
Daily Construction Emissions

Maximum Daily Emissions (lbs/day)[1, 2]						
Activity	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Demolition	0.91	14.16	26.89	0.09	7.84	1.56
Site Preparation	0.55	2.08	21.68	0.04	7.78	3.98
Grading	0.85	3.36	33.90	0.06	3.85	1.56
Building Construction	4.86	17.12	60.88	0.16	11.46	3.28
Paving	1.29	1.25	17.86	0.02	0.21	0.08
Architectural Coating	70.26	0.56	8.39	0.02	1.96	0.53
Maximum[1]	**70.26**	**17.12**	**60.88**	**0.16**	**11.46**	**3.98**
SCAQMD Threshold	75	100	550	150	150	55
Exceeds Threshold (?)	**No**	**No**	**No**	**No**	**No**	**No**

[1] Maximum daily emission during summer or winter; includes both on-site and off-site project emissions.
[2] Includes fugitive dust control measures and Tier 4 engine requirements.

The project must follow mandatory SCAQMD rules and requirements with regards to fugitive dust control, as described in Section 6.1.3. Compliance with the standard dust control measures is considered to be part of the conditions of approval for the project and built into the design features.

Table 13 shows that, the project's daily construction emissions will be below the applicable SCAQMD air quality standards and thresholds of significance. As a result, the project would not contribute substantially to an existing or projected air quality violation.

Furthermore, by complying with the SCAQMD standards, the project would not contribute to a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

The project's short-term construction impact on regional air resources is less than significant.

6.1.2 Fugitive Dust - Construction

The Project is required to comply with regional rules that assist in reducing short-term air pollutant emissions associated with suspended particulate matter, also known as fugitive dust. Fugitive dust emissions are commonly associated with land clearing activities, cut-and-fill grading operations, and exposure of soils to the air and wind. SCAQMD Rule 403 requires that fugitive dust is controlled with best-available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. In addition, SCAQMD Rules 402 and 403 require implementation of dust suppression techniques to prevent fugitive dust from creating a nuisance off site.

The following recommendations are listed to ensure full compliance with the applicable dust control standards.

DF-1 Prepare and implement a Construction Management Plan which will include Best Available Control Measures to be submitted to the City of Ontario.

DF-2 Follow the standard SCAQMD rules and requirements with regards to fugitive dust control, which includes, but are not limited to the following:

1. All active construction areas shall be watered two (2) times daily.
2. Speed on unpaved roads shall be reduced to less than 15 mph.
3. Any visible dirt deposition on any public roadway shall be swept or washed at the site access points within 30 minutes.
4. Any on-site stockpiles of debris, dirt or other dusty material shall be covered or watered twice daily.
5. All operations on any unpaved surface shall be suspended if winds exceed 15 mph.
6. Access points shall be washed or swept daily.
7. Construction sites shall be sandbagged for erosion control.
8. Apply nontoxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for 10 days or more).
9. Cover all trucks hauling dirt, sand, soil, or other loose materials, and maintain at least 2 feet of freeboard space in accordance with the requirements of California Vehicle Code (CVC) section 23114.
10. Pave or gravel construction access roads at least 100 feet onto the site from the main road and use gravel aprons at truck exits.
11. Replace the ground cover of disturbed areas as quickly possible.

12. A fugitive dust control plan should be prepared and submitted to SCAQMD prior to the start of construction.

6.1.3 Odors - Construction

Heavy-duty equipment in the project area during construction will emit odors; however, the construction activity would cease to occur after individual construction is completed. The project is required to comply with Rule 402 during construction, which states that a person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. No other sources of objectionable odors have been identified for the proposed Project.

Therefore, the project impact from odor emissions is less than significant.

6.1.4 Asbestos - Construction

Asbestos is a carcinogen and is categorized as a hazardous air pollutant by the Environmental Protection Agency (EPA). Asbestos fibers imbedded within construction materials become a health hazard once they are disturbed and rendered airborne, such as through physical contact like building renovation and demolition activities. Asbestos is regulated through the National Emissions Standards for Hazardous Air Pollutants (NESHAP) and SCAQMD is the local enforcement authority for asbestos.

The project is not expected to require the demolition of existing building or structures. Therefore, the potential risk from exposure to asbestos during construction is small.

Asbestos also occurs naturally in serpentine and ultramafic rock. Based on the California Division of Mines and Geology General Location Guide for Ultramafic Rocks in California - Areas More Likely to Contain Naturally Occurring Asbestos, naturally occurring asbestos has not been shown to occur within in the vicinity of the project site. Therefore, the potential risk for naturally occurring asbestos (NOA) during project construction is small.

In the event asbestos is found on the site, the project will be required to comply with SCAQMD and NESHAP standards and protocols. SCAQMD Rule 1403 establishes the survey requirements, notification, and work practice requirements to prevent asbestos emissions

during construction activities. By following the required asbestos abatement protocols, the project impact from asbestos would be less than significant.

6.1.5 Diesel Particulate Matter - Construction

The greatest potential for toxic air contaminant emissions from the project would be related to diesel particulate matter (DPM) emissions associated with heavy diesel equipment used during construction. According to SCAQMD methodology, health effects from carcinogenic air toxics are usually described in terms of "individual cancer risk". "Individual Cancer Risk" is the likelihood that a person exposed to concentrations of toxic air contaminants over a 30-year lifetime will contract cancer, based on the use of standard risk-assessment methodology.

The proposed project's construction activity is not expected to be a long-term (i.e., 30 years) source of toxic air contaminant emissions, thus the individual cancer risk is greatly reduced.

However, given the close proximity of the project to nearest sensitive receptors (residential homes to the north), several measures are provided to help ensure the potential health risk associated with DPM during construction is reduced to the maximum extent feasible. This includes a requirement for Tier 4 engines on all diesel-powered construction equipment. Tier 4 engines, along with the latest national fuel standards, have been shown to yield PM reductions of over 95% from the typical Tier 2 and Tier 3 engines[8].

It is presumed that with the recommended design features and Tier 4 engines in place that the potential short term construction health risks will be adequately reduced to be less than significant. It should be noted however, that a quantified diesel health risk assessment (HRA) has not been prepared as part of the scope of this analysis.

The following design features are recommended to help ensure the project does not expose receptors to substantial pollution concentrations during construction:

DF-3 All diesel construction equipment shall have Tier 4 low emission "clean diesel" engines (OEM or retrofit) that include diesel oxidation catalysts and diesel particulate filters that meet the latest CARB best available control technology.

[8] EPA. Control of Emissions of Air Pollution from Nonroad Diesel Engines and Fuel; Final Rule. (40 CFR Parts 9, 69, et al.)

DF-4 Construction equipment shall be maintained in proper tune.

DF-5 All construction vehicles shall be prohibited from excessive idling. Excessive idling is defined as five (5) minutes or longer.

DF-6 Minimize the simultaneous operation of multiple construction equipment units.

DF-7 The use of heavy construction equipment and earthmoving activity shall be suspended during Air Alerts when the Air Quality Index reaches the "Unhealthy" level.

DF-8 Establish an electricity supply to the construction site and use electric powered equipment instead of diesel-powered equipment or generators, where feasible.

DF-9 Utilize zero VOC and low VOC paints and solvents, wherever possible.

6.2 Long Term Air Quality Impacts - Operation

6.2.1 Daily Emissions - Operation

Long-term operational air pollutant impacts from the project are shown in Table 14. The project is not expected to exceed any of the allowable daily emissions thresholds for criteria pollutants at the regional level. CalEEMod daily emissions outputs are provided in Appendix A.

The project's daily operational emissions will be below the applicable SCAQMD air quality thresholds of significance and the project would not contribute substantially to an existing or projected air quality violation. Furthermore, by complying with the SCAQMD standards, the project would not contribute to a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

The project related long-term air quality impacts are less than significant.

Table 14
Daily Operational Emissions

Maximum Daily Emissions (lbs/day)[1]						
Activity	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Mobile Sources	17.27	14.68	127.09	0.24	23.87	6.46
Energy Sources	0.30	2.55	1.10	0.02	0.21	0.21
Area Sources	19.70	10.40	61.39	0.07	1.10	1.10
Total	**37.26**	**27.64**	**189.58**	**0.32**	**25.18**	**7.77**
SCAQMD Threshold	55	55	550	150	150	55
Exceeds Threshold (?)	No	No	No	No	No	No

[1] Maximum daily emission during summer or winter; includes both on-site and off-site project emissions.
[2] Daily emissions reports are provided in Appendix A.

6.2.2 Odors - Operation

Land uses that commonly receive odor complaints include agricultural uses (farming and livestock), chemical plants, composting operations, dairies, fiberglass molding facilities, food processing plants, landfills, refineries, rail yards, and wastewater treatment plants. The proposed project does not contain land uses that would typically be associated with significant odor emissions.

The project will be required to comply with standard building code requirements related to exhaust ventilation, as well as comply with SCAQMD Rule 402. Rule 402 requires that a person may not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. Project related odors are not expected to meet the criteria of being a nuisance. **The project's operation would result in less than significant odor impacts.**

6.2.3 Toxic Air Contaminants - Operations

The project would consist of commercial/retail and residential land uses. These types of projects do not include major sources of toxic air contaminants (TAC) emissions that would result in significant exposure of sensitive receptors to substantial pollutant concentrations. Therefore, **the project impact is considered less than significant.**

7.0 Greenhouse Gas Impact Analysis

Consistent with CEQA Guidelines, a significant impact related to greenhouse gas would occur if the proposed project is determined to:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of greenhouse gases.

For purposes of this project, the City of Ontario CCAP establishes the requirements for determining whether a project would have a significant impact to GHG emissions under CEQA.

The CCAP uses Screening Tables, which are setup similar to a checklist, with points allocated to certain elements of the project to reduce GHG emissions. If a project garners 100 points (by including enough GHG reducing elements), then the project is consistent with CCAP and the impact may be considered less than significant for purposes of CEQA.

The proposed project is expected to comply with the CCAP by implementing the Screening Table requirements into the project design. To help ensure the project adheres to the CCAP requirements, the following project design feature is provided:

DF-10 Implement the GHG Reduction Measures from the Ontario County Climate Action Plan (CAP) Screening Tables to achieve at least 100 points, per the requirements for Mixed Use Projects.

As described in Appendix B of the CCAP, for mixed use projects, both the residential and non-residential screening tables shall be completed. Mixed use Projects that garner at least 100 points will be consistent with the reduction quantities in the City's CAP and are considered less than significant for GHG emissions.

Therefore, with the implementation of the CCAP Screening Tables, the project is not expected to generate GHG emissions, either directly or indirectly, that would cause a significant impact on the environment. Also, by complying with the CCAP, the project will not conflict with an applicable plan, policy or regulation for the purpose of reducing the emissions of greenhouse gases and the impact is considered less than significant.

Furthermore, since the purpose of the City's CCAP is to ensure compliance with the state's climate initiatives for reducing GHG emissions, by complying with the CCAP, the project will also be in compliant with the broader statewide goals for combating climate change; such as those required in the CARB Scoping Plan and AB 32.

The mixed use project is also located within close proximity to high quality transit, located in a low VMT zone, and offers high-density residential development near commercial uses. The project will include pedestrian friendly and walkable design that will encourage fewer auto-based trips. The following project design features will be provided to further help reduce GHG emissions:

DF-11 Comply with the mandatory requirements of California Building Standards Code Title 24 Part 6 (Energy Code) and Title 24 Part 11 (CAL Green).

DF-12 Implement water conservation strategies, including low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and limit the amount of turf/sod, per CAL Green and City of Ontario requirements.

DF-13 Implement zero waste strategies, recycling and composting programs for residential and non-residential uses.

DF-14 Encourage residents and landscape maintenance crews to use electric landscaping equipment, such as lawn mowers and leaf blowers, wherever feasible.

DF-15 No natural gas or wood burning fireplaces shall be installed in any residential dwelling.

DF-16 Implement trip reduction measures that reduce the number of auto-based trips and encourage the use of transit, bicycling, and walking. Such as;

1. Improve the walkability and design of the project by including pedestrian and bicycling connections within the project site and to adjacent off-site facilities (i.e. sidewalks, crosswalks, foot paths, protected bike lanes, multi-purpose trails, direct parcel-to-parcel connections, wayfinding signage, etc.).

2. Provide traffic calming measures (i.e. marked crosswalks, raised crosswalks, raised intersections, count-down signal timers, curb

extensions, speed tables, median islands, tight corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, etc.)

3. Provide bicycle racks for the retail and commercial uses and secure bicycle parking areas for the office and residential uses.

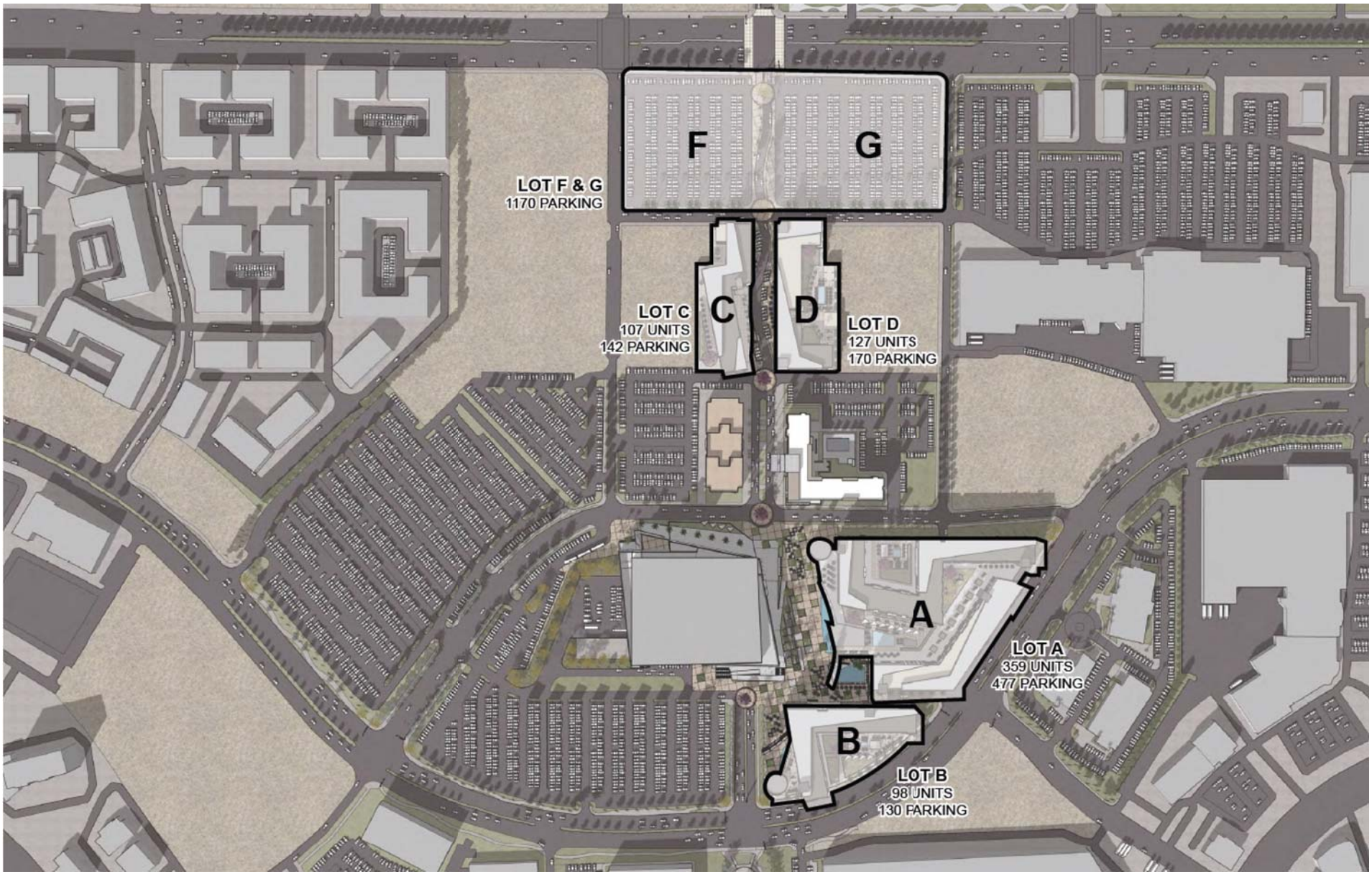
DF-17 Provide electric vehicle charging stations per the requirements of CALGreen.

Exhibits

Location Map

N

Site Plan


F
G
LOT F & G
1170 PARKING
C
D
LOT C
107 UNITS
142 PARKING
LOT D
127 UNITS
170 PARKING
A
LOT A
359 UNITS
477 PARKING
B
LOT B
98 UNITS
130 PARKING

Appendices

Appendix A

Daily Emissions Calculations Output
(CalEEMod)

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Toyota Arena Mixed Use Development

San Bernardino-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Mid Rise	691.00	Dwelling Unit	11.47	691,000.00	1976
Enclosed Parking with Elevator	919.00	Space	0.00	367,600.00	0
Parking Lot	1,170.00	Space	7.26	468,000.00	0
Regional Shopping Center	71.20	1000sqft	0.00	71,200.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	32
Climate Zone	10			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	531.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The proposed project consists of a mixed-use town center development with 691 multifamily DU and 71,200 square feet of commercial/retail land uses on approximately 18.73 acres.

Construction Phase - The project's architectural coating phase will be extended to 75 days.

Demolition - The project is proposing to demolish approximetely 326,026 square feet of surface asphalt parking lot.

Vehicle Trips - The trip generation rates have been updated to reflect Toyota Arena TIA Scoping Agreement, by RK, May 25, 2021 and Traffic Impact Study and SANBAG VMT Model.

Fleet Mix - Operational fleet mix adjusted to equal 2% trucks with GVWR > 10,000 lbs.

Woodstoves - SCAQMD Rule 445 restricts wood burning hearths/fireplaces from being installed in new development.

Construction Off-road Equipment Mitigation - Project will be required to comply with SCAQMD Rule 403 regarding fugitive dust control.

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	20.00	75.00
tblConstructionPhase	PhaseEndDate	4/13/2023	6/29/2023
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberWood	34.55	0.00
tblFleetMix	HHD	0.00	8.0940e-003
tblFleetMix	HHD	0.00	0.02
tblFleetMix	HHD	0.00	0.02
tblFleetMix	HHD	0.00	8.0940e-003
tblFleetMix	LDA	0.00	0.55
tblFleetMix	LDA	0.00	0.54
tblFleetMix	LDA	0.00	0.54
tblFleetMix	LDA	0.00	0.55
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT2	0.00	0.18
tblFleetMix	LDT2	0.00	0.17
tblFleetMix	LDT2	0.00	0.17
tblFleetMix	LDT2	0.00	0.18
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD2	0.00	3.3700e-003
tblFleetMix	LHD2	0.00	7.1960e-003

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblFleetMix	LHD2	0.00	7.1960e-003
tblFleetMix	LHD2	0.00	3.3700e-003
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MH	0.00	2.3750e-003
tblFleetMix	MH	0.00	5.0710e-003
tblFleetMix	MH	0.00	5.0710e-003
tblFleetMix	MH	0.00	2.3750e-003
tblFleetMix	MHD	0.00	5.3340e-003
tblFleetMix	MHD	0.00	0.01
tblFleetMix	MHD	0.00	0.01
tblFleetMix	MHD	0.00	5.3340e-003
tblFleetMix	OBUS	0.00	2.6200e-004
tblFleetMix	OBUS	0.00	5.5900e-004
tblFleetMix	OBUS	0.00	5.5900e-004
tblFleetMix	OBUS	0.00	2.6200e-004
tblFleetMix	SBUS	0.00	4.4700e-004
tblFleetMix	SBUS	0.00	9.5400e-004
tblFleetMix	SBUS	0.00	9.5400e-004
tblFleetMix	SBUS	0.00	4.4700e-004
tblFleetMix	UBUS	0.00	1.1900e-004
tblFleetMix	UBUS	0.00	2.5400e-004
tblFleetMix	UBUS	0.00	2.5400e-004

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblFleetMix	UBUS	0.00	1.1900e-004
tblLandUse	LotAcreage	18.18	11.47
tblLandUse	LotAcreage	8.27	0.00
tblLandUse	LotAcreage	10.53	7.26
tblLandUse	LotAcreage	1.63	0.00
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	HO_TL	8.70	4.37
tblVehicleTrips	HO_TTP	40.60	0.00
tblVehicleTrips	HS_TL	5.90	4.37
tblVehicleTrips	HS_TTP	19.20	0.00
tblVehicleTrips	HW_TL	14.70	4.37
tblVehicleTrips	HW_TTP	40.20	100.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	ST_TR	4.91	5.17
tblVehicleTrips	ST_TR	46.12	36.38
tblVehicleTrips	SU_TR	4.09	5.17
tblVehicleTrips	WD_TR	5.44	5.17
tblVehicleTrips	WD_TR	37.75	29.77
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	6.4347	46.4611	59.9899	0.1622	19.8582	2.0456	21.9038	10.1558	1.8819	12.0378	0.0000	16,507.4778	16,507.4778	1.9489	0.9233	16,807.9157
2022	5.7820	27.6734	55.8128	0.1582	11.1581	0.9758	12.1338	2.9915	0.9189	3.9104	0.0000	16,137.5984	16,137.5984	0.9697	0.8848	16,425.5012
2023	70.4209	24.2267	52.3577	0.1536	11.1580	0.8064	11.9644	2.9915	0.7587	3.7502	0.0000	15,714.5265	15,714.5265	0.9318	0.8384	15,987.6709
Maximum	**70.4209**	**46.4611**	**59.9899**	**0.1622**	**19.8582**	**2.0456**	**21.9038**	**10.1558**	**1.8819**	**12.0378**	**0.0000**	**16,507.4778**	**16,507.4778**	**1.9489**	**0.9233**	**16,807.9157**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	4.8616	16.4282	60.8749	0.1622	11.1581	0.2990	11.4571	3.9176	0.2858	3.9807	0.0000	16,507.4778	16,507.4778	1.9489	0.9233	16,807.9157
2022	4.4036	14.2925	56.9096	0.1582	11.1581	0.2076	11.3656	2.9915	0.1985	3.1900	0.0000	16,137.5984	16,137.5984	0.9697	0.8848	16,425.5012
2023	70.2589	12.0766	53.5740	0.1536	11.1580	0.1474	11.3054	2.9915	0.1410	3.1326	0.0000	15,714.5265	15,714.5265	0.9318	0.8384	15,987.6709
Maximum	**70.2589**	**16.4282**	**60.8749**	**0.1622**	**11.1581**	**0.2990**	**11.4571**	**3.9176**	**0.2858**	**3.9807**	**0.0000**	**16,507.4778**	**16,507.4778**	**1.9489**	**0.9233**	**16,807.9157**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	3.77	56.49	-1.90	0.00	20.63	82.92	25.81	38.65	82.43	47.69	0.00	0.00	0.00	0.00	0.00	0.00

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	19.6950	10.4024	61.3876	0.0652		1.1041	1.1041		1.1041	1.1041	0.0000	12,541.1224	12,541.1224	0.3383	0.2280	12,617.5340
Energy	0.2983	2.5513	1.1031	0.0163		0.2061	0.2061		0.2061	0.2061		3,253.7371	3,253.7371	0.0624	0.0597	3,273.0725
Mobile	17.2690	13.8038	127.0914	0.2363	23.6977	0.1690	23.8666	6.3029	0.1573	6.4602		24,255.5834	24,255.5834	1.5947	1.1054	24,624.8618
Total	**37.2623**	**26.7575**	**189.5821**	**0.3178**	**23.6977**	**1.4792**	**25.1768**	**6.3029**	**1.4675**	**7.7704**	**0.0000**	**40,050.4429**	**40,050.4429**	**1.9954**	**1.3931**	**40,515.4682**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	19.6950	10.4024	61.3876	0.0652		1.1041	1.1041		1.1041	1.1041	0.0000	12,541.1224	12,541.1224	0.3383	0.2280	12,617.5340
Energy	0.2983	2.5513	1.1031	0.0163		0.2061	0.2061		0.2061	0.2061		3,253.7371	3,253.7371	0.0624	0.0597	3,273.0725
Mobile	17.2690	13.8038	127.0914	0.2363	23.6977	0.1690	23.8666	6.3029	0.1573	6.4602		24,255.5834	24,255.5834	1.5947	1.1054	24,624.8618
Total	**37.2623**	**26.7575**	**189.5821**	**0.3178**	**23.6977**	**1.4792**	**25.1768**	**6.3029**	**1.4675**	**7.7704**	**0.0000**	**40,050.4429**	**40,050.4429**	**1.9954**	**1.3931**	**40,515.4682**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	10/1/2021	10/28/2021	5	20	
2	Site Preparation	Site Preparation	10/29/2021	11/11/2021	5	10	
3	Grading	Grading	11/12/2021	12/23/2021	5	30	
4	Building Construction	Building Construction	12/24/2021	2/16/2023	5	300	
5	Paving	Paving	2/17/2023	3/16/2023	5	20	
6	Architectural Coating	Architectural Coating	3/17/2023	6/29/2023	5	75	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 90

Acres of Paving: 7.26

Residential Indoor: 1,399,275; Residential Outdoor: 466,425; Non-Residential Indoor: 106,800; Non-Residential Outdoor: 35,600; Striped Parking Area: 50,136 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	7.00	231	0.29
Demolition	Excavators	3	8.00	158	0.38
Grading	Excavators	2	8.00	158	0.38

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	1,483.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	871.00	222.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	174.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					16.0493	0.0000	16.0493	2.4300	0.0000	2.4300			0.0000			0.0000
Off-Road	3.1651	31.4407	21.5650	0.0388		1.5513	1.5513		1.4411	1.4411		3,747.9449	3,747.9449	1.0549		3,774.3174
Total	**3.1651**	**31.4407**	**21.5650**	**0.0388**	**16.0493**	**1.5513**	**17.6006**	**2.4300**	**1.4411**	**3.8711**		**3,747.9449**	**3,747.9449**	**1.0549**		**3,774.3174**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Demolition - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3825	11.5481	2.9311	0.0448	1.2986	0.1738	1.4724	0.3561	0.1663	0.5224		4,874.0609	4,874.0609	0.2123	0.7723	5,109.5096
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0689	0.0459	0.6786	1.6000e-003	0.1677	9.4000e-004	0.1686	0.0445	8.6000e-004	0.0453		161.8483	161.8483	4.5800e-003	4.2800e-003	163.2380
Total	**0.4515**	**11.5940**	**3.6097**	**0.0464**	**1.4662**	**0.1748**	**1.6410**	**0.4006**	**0.1672**	**0.5677**		**5,035.9092**	**5,035.9092**	**0.2169**	**0.7766**	**5,272.7476**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.1388	0.0000	6.1388	0.9295	0.0000	0.9295			0.0000			0.0000
Off-Road	0.4623	2.0032	23.2798	0.0388		0.0616	0.0616		0.0616	0.0616	0.0000	3,747.9449	3,747.9449	1.0549		3,774.3174
Total	**0.4623**	**2.0032**	**23.2798**	**0.0388**	**6.1388**	**0.0616**	**6.2005**	**0.9295**	**0.0616**	**0.9911**	**0.0000**	**3,747.9449**	**3,747.9449**	**1.0549**		**3,774.3174**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Demolition - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3825	11.5481	2.9311	0.0448	1.2986	0.1738	1.4724	0.3561	0.1663	0.5224		4,874.0609	4,874.0609	0.2123	0.7723	5,109.5096
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0689	0.0459	0.6786	1.6000e-003	0.1677	9.4000e-004	0.1686	0.0445	8.6000e-004	0.0453		161.8483	161.8483	4.5800e-003	4.2800e-003	163.2380
Total	**0.4515**	**11.5940**	**3.6097**	**0.0464**	**1.4662**	**0.1748**	**1.6410**	**0.4006**	**0.1672**	**0.5677**		**5,035.9092**	**5,035.9092**	**0.2169**	**0.7766**	**5,272.7476**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809		3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**19.6570**	**2.0445**	**21.7015**	**10.1025**	**1.8809**	**11.9834**		**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0827	0.0551	0.8143	1.9200e-003	0.2012	1.1300e-003	0.2023	0.0534	1.0400e-003	0.0544		194.2180	194.2180	5.5000e-003	5.1300e-003	195.8856
Total	**0.0827**	**0.0551**	**0.8143**	**1.9200e-003**	**0.2012**	**1.1300e-003**	**0.2023**	**0.0534**	**1.0400e-003**	**0.0544**		**194.2180**	**194.2180**	**5.5000e-003**	**5.1300e-003**	**195.8856**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.5188	0.0000	7.5188	3.8642	0.0000	3.8642			0.0000			0.0000
Off-Road	0.4656	2.0175	20.8690	0.0380		0.0621	0.0621		0.0621	0.0621	0.0000	3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**0.4656**	**2.0175**	**20.8690**	**0.0380**	**7.5188**	**0.0621**	**7.5809**	**3.8642**	**0.0621**	**3.9263**	**0.0000**	**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0827	0.0551	0.8143	1.9200e-003	0.2012	1.1300e-003	0.2023	0.0534	1.0400e-003	0.0544		194.2180	194.2180	5.5000e-003	5.1300e-003	195.8856
Total	**0.0827**	**0.0551**	**0.8143**	**1.9200e-003**	**0.2012**	**1.1300e-003**	**0.2023**	**0.0534**	**1.0400e-003**	**0.0544**		**194.2180**	**194.2180**	**5.5000e-003**	**5.1300e-003**	**195.8856**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.2036	0.0000	9.2036	3.6538	0.0000	3.6538			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265		6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**9.2036**	**1.9853**	**11.1889**	**3.6538**	**1.8265**	**5.4803**		**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0919	0.0612	0.9048	2.1300e-003	0.2236	1.2500e-003	0.2248	0.0593	1.1500e-003	0.0604		215.7978	215.7978	6.1100e-003	5.7000e-003	217.6506
Total	**0.0919**	**0.0612**	**0.9048**	**2.1300e-003**	**0.2236**	**1.2500e-003**	**0.2248**	**0.0593**	**1.1500e-003**	**0.0604**		**215.7978**	**215.7978**	**6.1100e-003**	**5.7000e-003**	**217.6506**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.5204	0.0000	3.5204	1.3976	0.0000	1.3976			0.0000			0.0000
Off-Road	0.7616	3.3000	32.9991	0.0620		0.1015	0.1015		0.1015	0.1015	0.0000	6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**0.7616**	**3.3000**	**32.9991**	**0.0620**	**3.5204**	**0.1015**	**3.6219**	**1.3976**	**0.1015**	**1.4991**	**0.0000**	**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0919	0.0612	0.9048	2.1300e-003	0.2236	1.2500e-003	0.2248	0.0593	1.1500e-003	0.0604		215.7978	215.7978	6.1100e-003	5.7000e-003	217.6506
Total	**0.0919**	**0.0612**	**0.9048**	**2.1300e-003**	**0.2236**	**1.2500e-003**	**0.2248**	**0.0593**	**1.1500e-003**	**0.0604**		**215.7978**	**215.7978**	**6.1100e-003**	**5.7000e-003**	**217.6506**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.5310	11.5275	4.0099	0.0425	1.4223	0.2037	1.6261	0.4096	0.1949	0.6045		4,556.1208	4,556.1208	0.1292	0.6749	4,760.4663
Worker	4.0029	2.6661	39.4047	0.0928	9.7357	0.0545	9.7902	2.5820	0.0502	2.6321		9,397.9931	9,397.9931	0.2662	0.2485	9,478.6851
Total	**4.5338**	**14.1935**	**43.4147**	**0.1353**	**11.1581**	**0.2582**	**11.4163**	**2.9915**	**0.2451**	**3.2366**		**13,954.1139**	**13,954.1139**	**0.3954**	**0.9233**	**14,239.1514**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.5310	11.5275	4.0099	0.0425	1.4223	0.2037	1.6261	0.4096	0.1949	0.6045		4,556.1208	4,556.1208	0.1292	0.6749	4,760.4663
Worker	4.0029	2.6661	39.4047	0.0928	9.7357	0.0545	9.7902	2.5820	0.0502	2.6321		9,397.9931	9,397.9931	0.2662	0.2485	9,478.6851
Total	**4.5338**	**14.1935**	**43.4147**	**0.1353**	**11.1581**	**0.2582**	**11.4163**	**2.9915**	**0.2451**	**3.2366**		**13,954.1139**	**13,954.1139**	**0.3954**	**0.9233**	**14,239.1514**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.3869	9.7214	3.5677	0.0414	1.4223	0.1157	1.5380	0.4096	0.1107	0.5202		4,441.5281	4,441.5281	0.1200	0.6573	4,640.3962
Worker	3.6889	2.3364	35.8817	0.0899	9.7357	0.0511	9.7868	2.5820	0.0471	2.6290		9,141.7367	9,141.7367	0.2377	0.2275	9,215.4729
Total	**4.0757**	**12.0578**	**39.4494**	**0.1313**	**11.1581**	**0.1668**	**11.3248**	**2.9915**	**0.1577**	**3.1492**		**13,583.2648**	**13,583.2648**	**0.3577**	**0.8848**	**13,855.8690**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.3869	9.7214	3.5677	0.0414	1.4223	0.1157	1.5380	0.4096	0.1107	0.5202		4,441.5281	4,441.5281	0.1200	0.6573	4,640.3962
Worker	3.6889	2.3364	35.8817	0.0899	9.7357	0.0511	9.7868	2.5820	0.0471	2.6290		9,141.7367	9,141.7367	0.2377	0.2275	9,215.4729
Total	**4.0757**	**12.0578**	**39.4494**	**0.1313**	**11.1581**	**0.1668**	**11.3248**	**2.9915**	**0.1577**	**3.1492**		**13,583.2648**	**13,583.2648**	**0.3577**	**0.8848**	**13,855.8690**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2599	7.7868	3.2674	0.0397	1.4223	0.0585	1.4808	0.4096	0.0560	0.4655		4,260.5836	4,260.5836	0.1114	0.6292	4,450.8606
Worker	3.4058	2.0551	32.8463	0.0870	9.7357	0.0481	9.7838	2.5820	0.0443	2.6262		8,898.7330	8,898.7330	0.2126	0.2093	8,966.4042
Total	**3.6656**	**9.8419**	**36.1137**	**0.1267**	**11.1580**	**0.1066**	**11.2647**	**2.9915**	**0.1003**	**3.0918**		**13,159.3166**	**13,159.3166**	**0.3239**	**0.8384**	**13,417.2648**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2599	7.7868	3.2674	0.0397	1.4223	0.0585	1.4808	0.4096	0.0560	0.4655		4,260.5836	4,260.5836	0.1114	0.6292	4,450.8606
Worker	3.4058	2.0551	32.8463	0.0870	9.7357	0.0481	9.7838	2.5820	0.0443	2.6262		8,898.7330	8,898.7330	0.2126	0.2093	8,966.4042
Total	**3.6656**	**9.8419**	**36.1137**	**0.1267**	**11.1580**	**0.1066**	**11.2647**	**2.9915**	**0.1003**	**3.0918**		**13,159.3166**	**13,159.3166**	**0.3239**	**0.8384**	**13,417.2648**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694		2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.9511					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9838**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**		**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0587	0.0354	0.5657	1.5000e-003	0.1677	8.3000e-004	0.1685	0.0445	7.6000e-004	0.0452		153.2503	153.2503	3.6600e-003	3.6000e-003	154.4157
Total	**0.0587**	**0.0354**	**0.5657**	**1.5000e-003**	**0.1677**	**8.3000e-004**	**0.1685**	**0.0445**	**7.6000e-004**	**0.0452**		**153.2503**	**153.2503**	**3.6600e-003**	**3.6000e-003**	**154.4157**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2805	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374	0.0000	2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.9511					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2315**	**1.2154**	**17.2957**	**0.0228**		**0.0374**	**0.0374**		**0.0374**	**0.0374**	**0.0000**	**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0587	0.0354	0.5657	1.5000e-003	0.1677	8.3000e-004	0.1685	0.0445	7.6000e-004	0.0452		153.2503	153.2503	3.6600e-003	3.6000e-003	154.4157
Total	**0.0587**	**0.0354**	**0.5657**	**1.5000e-003**	**0.1677**	**8.3000e-004**	**0.1685**	**0.0445**	**7.6000e-004**	**0.0452**		**153.2503**	**153.2503**	**3.6600e-003**	**3.6000e-003**	**154.4157**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	69.5489					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708		281.4481	281.4481	0.0168		281.8690
Total	**69.7405**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**		**281.4481**	**281.4481**	**0.0168**		**281.8690**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.6804	0.4105	6.5617	0.0174	1.9449	9.6100e-003	1.9545	0.5158	8.8400e-003	0.5246		1,777.7033	1,777.7033	0.0425	0.0418	1,791.2220
Total	**0.6804**	**0.4105**	**6.5617**	**0.0174**	**1.9449**	**9.6100e-003**	**1.9545**	**0.5158**	**8.8400e-003**	**0.5246**		**1,777.7033**	**1,777.7033**	**0.0425**	**0.0418**	**1,791.2220**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	69.5489					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0297	0.1288	1.8324	2.9700e-003		3.9600e-003	3.9600e-003		3.9600e-003	3.9600e-003	0.0000	281.4481	281.4481	0.0168		281.8690
Total	**69.5786**	**0.1288**	**1.8324**	**2.9700e-003**		**3.9600e-003**	**3.9600e-003**		**3.9600e-003**	**3.9600e-003**	**0.0000**	**281.4481**	**281.4481**	**0.0168**		**281.8690**

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.6804	0.4105	6.5617	0.0174	1.9449	9.6100e-003	1.9545	0.5158	8.8400e-003	0.5246		1,777.7033	1,777.7033	0.0425	0.0418	1,791.2220
Total	**0.6804**	**0.4105**	**6.5617**	**0.0174**	**1.9449**	**9.6100e-003**	**1.9545**	**0.5158**	**8.8400e-003**	**0.5246**		**1,777.7033**	**1,777.7033**	**0.0425**	**0.0418**	**1,791.2220**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	17.2690	13.8038	127.0914	0.2363	23.6977	0.1690	23.8666	6.3029	0.1573	6.4602		24,255.5834	24,255.5834	1.5947	1.1054	24,624.8618
Unmitigated	17.2690	13.8038	127.0914	0.2363	23.6977	0.1690	23.8666	6.3029	0.1573	6.4602		24,255.5834	24,255.5834	1.5947	1.1054	24,624.8618

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	3,572.47	3,572.47	3572.47	5,682,657	5,682,657
Enclosed Parking with Elevator	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Regional Shopping Center	2,119.62	2,590.26	1502.32	4,539,098	4,539,098
Total	5,692.09	6,162.73	5,074.79	10,221,754	10,221,754

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	4.37	4.37	4.37	100.00	0.00	0.00	100	0	0
Enclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Regional Shopping Center	16.60	8.40	6.90	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.550545	0.057163	0.176442	0.142301	0.027646	0.003370	0.005334	0.008094	0.000262	0.000119	0.025903	0.000447	0.002375
Enclosed Parking with Elevator	0.537785	0.055838	0.172353	0.139003	0.027005	0.007196	0.011392	0.017285	0.000559	0.000254	0.025303	0.000954	0.005071
Parking Lot	0.537785	0.055838	0.172353	0.139003	0.027005	0.007196	0.011392	0.017285	0.000559	0.000254	0.025303	0.000954	0.005071
Regional Shopping Center	0.550545	0.057163	0.176442	0.142301	0.027646	0.003370	0.005334	0.008094	0.000262	0.000119	0.025903	0.000447	0.002375

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.2983	2.5513	1.1031	0.0163		0.2061	0.2061		0.2061	0.2061		3,253.7371	3,253.7371	0.0624	0.0597	3,273.0725
NaturalGas Unmitigated	0.2983	2.5513	1.1031	0.0163		0.2061	0.2061		0.2061	0.2061		3,253.7371	3,253.7371	0.0624	0.0597	3,273.0725

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	27227.6	0.2936	2.5092	1.0678	0.0160		0.2029	0.2029		0.2029	0.2029		3,203.2488	3,203.2488	0.0614	0.0587	3,222.2841
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	429.151	4.6300e-003	0.0421	0.0353	2.5000e-004		3.2000e-003	3.2000e-003		3.2000e-003	3.2000e-003		50.4883	50.4883	9.7000e-004	9.3000e-004	50.7883
Total		**0.2983**	**2.5513**	**1.1031**	**0.0163**		**0.2061**	**0.2061**		**0.2061**	**0.2061**		**3,253.7371**	**3,253.7371**	**0.0624**	**0.0597**	**3,273.0725**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	27.2276	0.2936	2.5092	1.0678	0.0160		0.2029	0.2029		0.2029	0.2029		3,203.2488	3,203.2488	0.0614	0.0587	3,222.2841
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	0.429151	4.6300e-003	0.0421	0.0353	2.5000e-004		3.2000e-003	3.2000e-003		3.2000e-003	3.2000e-003		50.4883	50.4883	9.7000e-004	9.3000e-004	50.7883
Total		**0.2983**	**2.5513**	**1.1031**	**0.0163**		**0.2061**	**0.2061**		**0.2061**	**0.2061**		**3,253.7371**	**3,253.7371**	**0.0624**	**0.0597**	**3,273.0725**

6.0 Area Detail

6.1 Mitigation Measures Area

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	19.6950	10.4024	61.3876	0.0652		1.1041	1.1041		1.1041	1.1041	0.0000	12,541.1224	12,541.1224	0.3383	0.2280	12,617.5340
Unmitigated	19.6950	10.4024	61.3876	0.0652		1.1041	1.1041		1.1041	1.1041	0.0000	12,541.1224	12,541.1224	0.3383	0.2280	12,617.5340

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.4291					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	15.3875					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1.1402	9.7431	4.1460	0.0622		0.7877	0.7877		0.7877	0.7877	0.0000	12,438.0000	12,438.0000	0.2384	0.2280	12,511.9128
Landscaping	1.7383	0.6593	57.2416	3.0300e-003		0.3164	0.3164		0.3164	0.3164		103.1224	103.1224	0.1000		105.6212
Total	**19.6950**	**10.4024**	**61.3876**	**0.0652**		**1.1041**	**1.1041**		**1.1041**	**1.1041**	**0.0000**	**12,541.1224**	**12,541.1224**	**0.3383**	**0.2280**	**12,617.5340**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.4291					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	15.3875					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1.1402	9.7431	4.1460	0.0622		0.7877	0.7877		0.7877	0.7877	0.0000	12,438.0000	12,438.0000	0.2384	0.2280	12,511.9128
Landscaping	1.7383	0.6593	57.2416	3.0300e-003		0.3164	0.3164		0.3164	0.3164		103.1224	103.1224	0.1000		105.6212
Total	**19.6950**	**10.4024**	**61.3876**	**0.0652**		**1.1041**	**1.1041**		**1.1041**	**1.1041**	**0.0000**	**12,541.1224**	**12,541.1224**	**0.3383**	**0.2280**	**12,617.5340**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Toyota Arena Mixed Use Development

San Bernardino-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Mid Rise	691.00	Dwelling Unit	11.47	691,000.00	1976
Enclosed Parking with Elevator	919.00	Space	0.00	367,600.00	0
Parking Lot	1,170.00	Space	7.26	468,000.00	0
Regional Shopping Center	71.20	1000sqft	0.00	71,200.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	32
Climate Zone	10			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	531.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The proposed project consists of a mixed-use town center development with 691 multifamily DU and 71,200 square feet of commercial/retail land uses on approximately 18.73 acres.

Construction Phase - The project's architectural coating phase will be extended to 75 days.

Demolition - The project is proposing to demolish approximetely 326,026 square feet of surface asphalt parking lot.

Vehicle Trips - The trip generation rates have been updated to reflect Toyota Arena TIA Scoping Agreement, by RK, May 25, 2021 and Traffic Impact Study and SANBAG VMT Model.

Fleet Mix - Operational fleet mix adjusted to equal 2% trucks with GVWR > 10,000 lbs.

Woodstoves - SCAQMD Rule 445 restricts wood burning hearths/fireplaces from being installed in new development.

Construction Off-road Equipment Mitigation - Project will be required to comply with SCAQMD Rule 403 regarding fugitive dust control.

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	20.00	75.00
tblConstructionPhase	PhaseEndDate	4/13/2023	6/29/2023
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberWood	34.55	0.00
tblFleetMix	HHD	0.00	8.0940e-003
tblFleetMix	HHD	0.00	0.02
tblFleetMix	HHD	0.00	0.02
tblFleetMix	HHD	0.00	8.0940e-003
tblFleetMix	LDA	0.00	0.55
tblFleetMix	LDA	0.00	0.54
tblFleetMix	LDA	0.00	0.54
tblFleetMix	LDA	0.00	0.55
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT2	0.00	0.18
tblFleetMix	LDT2	0.00	0.17
tblFleetMix	LDT2	0.00	0.17
tblFleetMix	LDT2	0.00	0.18
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD2	0.00	3.3700e-003
tblFleetMix	LHD2	0.00	7.1960e-003

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblFleetMix	LHD2	0.00	7.1960e-003
tblFleetMix	LHD2	0.00	3.3700e-003
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MH	0.00	2.3750e-003
tblFleetMix	MH	0.00	5.0710e-003
tblFleetMix	MH	0.00	5.0710e-003
tblFleetMix	MH	0.00	2.3750e-003
tblFleetMix	MHD	0.00	5.3340e-003
tblFleetMix	MHD	0.00	0.01
tblFleetMix	MHD	0.00	0.01
tblFleetMix	MHD	0.00	5.3340e-003
tblFleetMix	OBUS	0.00	2.6200e-004
tblFleetMix	OBUS	0.00	5.5900e-004
tblFleetMix	OBUS	0.00	5.5900e-004
tblFleetMix	OBUS	0.00	2.6200e-004
tblFleetMix	SBUS	0.00	4.4700e-004
tblFleetMix	SBUS	0.00	9.5400e-004
tblFleetMix	SBUS	0.00	9.5400e-004
tblFleetMix	SBUS	0.00	4.4700e-004
tblFleetMix	UBUS	0.00	1.1900e-004
tblFleetMix	UBUS	0.00	2.5400e-004
tblFleetMix	UBUS	0.00	2.5400e-004

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblFleetMix	UBUS	0.00	1.1900e-004
tblLandUse	LotAcreage	18.18	11.47
tblLandUse	LotAcreage	8.27	0.00
tblLandUse	LotAcreage	10.53	7.26
tblLandUse	LotAcreage	1.63	0.00
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	HO_TL	8.70	4.37
tblVehicleTrips	HO_TTP	40.60	0.00
tblVehicleTrips	HS_TL	5.90	4.37
tblVehicleTrips	HS_TTP	19.20	0.00
tblVehicleTrips	HW_TL	14.70	4.37
tblVehicleTrips	HW_TTP	40.20	100.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	ST_TR	4.91	5.17
tblVehicleTrips	ST_TR	46.12	36.38
tblVehicleTrips	SU_TR	4.09	5.17
tblVehicleTrips	WD_TR	5.44	5.17
tblVehicleTrips	WD_TR	37.75	29.77
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	6.2538	46.4642	53.0187	0.1535	19.8582	2.0456	21.9038	10.1558	1.8819	12.0378	0.0000	15,621.5062	15,621.5062	1.9489	0.9324	15,924.5846
2022	5.6217	28.2785	49.5312	0.1498	11.1581	0.9761	12.1342	2.9915	0.9192	3.9107	0.0000	15,280.3911	15,280.3911	0.9684	0.8933	15,570.8009
2023	70.3959	24.7705	46.6465	0.1455	11.1580	0.8066	11.9646	2.9915	0.7589	3.7504	0.0000	14,888.1518	14,888.1518	0.9311	0.8471	15,163.8676
Maximum	**70.3959**	**46.4642**	**53.0187**	**0.1535**	**19.8582**	**2.0456**	**21.9038**	**10.1558**	**1.8819**	**12.0378**	**0.0000**	**15,621.5062**	**15,621.5062**	**1.9489**	**0.9324**	**15,924.5846**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	4.6807	17.1150	53.9038	0.1535	11.1581	0.2995	11.4576	3.9176	0.2863	3.9807	0.0000	15,621.5062	15,621.5062	1.9489	0.9324	15,924.5846
2022	4.2433	14.8976	50.6281	0.1498	11.1581	0.2079	11.3660	2.9915	0.1988	3.1904	0.0000	15,280.3911	15,280.3911	0.9684	0.8933	15,570.8009
2023	70.2340	12.6203	47.8627	0.1455	11.1580	0.1477	11.3057	2.9915	0.1413	3.1328	0.0000	14,888.1518	14,888.1518	0.9311	0.8471	15,163.8676
Maximum	**70.2340**	**17.1150**	**53.9038**	**0.1535**	**11.1581**	**0.2995**	**11.4576**	**3.9176**	**0.2863**	**3.9807**	**0.0000**	**15,621.5062**	**15,621.5062**	**1.9489**	**0.9324**	**15,924.5846**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	3.78	55.15	-2.14	0.00	20.63	82.89	25.81	38.65	82.40	47.69	0.00	0.00	0.00	0.00	0.00	0.00

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	19.6950	10.4024	61.3876	0.0652		1.1041	1.1041		1.1041	1.1041	0.0000	12,541.1224	12,541.1224	0.3383	0.2280	12,617.5340
Energy	0.2983	2.5513	1.1031	0.0163		0.2061	0.2061		0.2061	0.2061		3,253.7371	3,253.7371	0.0624	0.0597	3,273.0725
Mobile	14.6266	14.6824	116.7457	0.2181	23.6977	0.1691	23.8667	6.3029	0.1574	6.4603		22,396.7406	22,396.7406	1.6802	1.1415	22,778.9089
Total	**34.6199**	**27.6361**	**179.2364**	**0.2996**	**23.6977**	**1.4793**	**25.1769**	**6.3029**	**1.4676**	**7.7705**	**0.0000**	**38,191.6001**	**38,191.6001**	**2.0809**	**1.4292**	**38,669.5153**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	19.6950	10.4024	61.3876	0.0652		1.1041	1.1041		1.1041	1.1041	0.0000	12,541.1224	12,541.1224	0.3383	0.2280	12,617.5340
Energy	0.2983	2.5513	1.1031	0.0163		0.2061	0.2061		0.2061	0.2061		3,253.7371	3,253.7371	0.0624	0.0597	3,273.0725
Mobile	14.6266	14.6824	116.7457	0.2181	23.6977	0.1691	23.8667	6.3029	0.1574	6.4603		22,396.7406	22,396.7406	1.6802	1.1415	22,778.9089
Total	**34.6199**	**27.6361**	**179.2364**	**0.2996**	**23.6977**	**1.4793**	**25.1769**	**6.3029**	**1.4676**	**7.7705**	**0.0000**	**38,191.6001**	**38,191.6001**	**2.0809**	**1.4292**	**38,669.5153**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	10/1/2021	10/28/2021	5	20	
2	Site Preparation	Site Preparation	10/29/2021	11/11/2021	5	10	
3	Grading	Grading	11/12/2021	12/23/2021	5	30	
4	Building Construction	Building Construction	12/24/2021	2/16/2023	5	300	
5	Paving	Paving	2/17/2023	3/16/2023	5	20	
6	Architectural Coating	Architectural Coating	3/17/2023	6/29/2023	5	75	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 90

Acres of Paving: 7.26

Residential Indoor: 1,399,275; Residential Outdoor: 466,425; Non-Residential Indoor: 106,800; Non-Residential Outdoor: 35,600; Striped Parking Area: 50,136 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	7.00	231	0.29
Demolition	Excavators	3	8.00	158	0.38
Grading	Excavators	2	8.00	158	0.38

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	1,483.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	871.00	222.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	174.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					16.0493	0.0000	16.0493	2.4300	0.0000	2.4300			0.0000			0.0000
Off-Road	3.1651	31.4407	21.5650	0.0388		1.5513	1.5513		1.4411	1.4411		3,747.9449	3,747.9449	1.0549		3,774.3174
Total	**3.1651**	**31.4407**	**21.5650**	**0.0388**	**16.0493**	**1.5513**	**17.6006**	**2.4300**	**1.4411**	**3.8711**		**3,747.9449**	**3,747.9449**	**1.0549**		**3,774.3174**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Demolition - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3721	12.1085	2.9946	0.0448	1.2986	0.1740	1.4726	0.3561	0.1665	0.5226		4,876.6311	4,876.6311	0.2118	0.7727	5,112.1890
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0661	0.0483	0.5563	1.4500e-003	0.1677	9.4000e-004	0.1686	0.0445	8.6000e-004	0.0453		146.5366	146.5366	4.5600e-003	4.4200e-003	147.9673
Total	**0.4382**	**12.1568**	**3.5508**	**0.0463**	**1.4662**	**0.1750**	**1.6412**	**0.4006**	**0.1674**	**0.5679**		**5,023.1677**	**5,023.1677**	**0.2163**	**0.7771**	**5,260.1563**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.1388	0.0000	6.1388	0.9295	0.0000	0.9295			0.0000			0.0000
Off-Road	0.4623	2.0032	23.2798	0.0388		0.0616	0.0616		0.0616	0.0616	0.0000	3,747.9449	3,747.9449	1.0549		3,774.3174
Total	**0.4623**	**2.0032**	**23.2798**	**0.0388**	**6.1388**	**0.0616**	**6.2005**	**0.9295**	**0.0616**	**0.9911**	**0.0000**	**3,747.9449**	**3,747.9449**	**1.0549**		**3,774.3174**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Demolition - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3721	12.1085	2.9946	0.0448	1.2986	0.1740	1.4726	0.3561	0.1665	0.5226		4,876.6311	4,876.6311	0.2118	0.7727	5,112.1890
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0661	0.0483	0.5563	1.4500e-003	0.1677	9.4000e-004	0.1686	0.0445	8.6000e-004	0.0453		146.5366	146.5366	4.5600e-003	4.4200e-003	147.9673
Total	**0.4382**	**12.1568**	**3.5508**	**0.0463**	**1.4662**	**0.1750**	**1.6412**	**0.4006**	**0.1674**	**0.5679**		**5,023.1677**	**5,023.1677**	**0.2163**	**0.7771**	**5,260.1563**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809		3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**19.6570**	**2.0445**	**21.7015**	**10.1025**	**1.8809**	**11.9834**		**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0793	0.0580	0.6675	1.7400e-003	0.2012	1.1300e-003	0.2023	0.0534	1.0400e-003	0.0544		175.8439	175.8439	5.4700e-003	5.3000e-003	177.5607
Total	**0.0793**	**0.0580**	**0.6675**	**1.7400e-003**	**0.2012**	**1.1300e-003**	**0.2023**	**0.0534**	**1.0400e-003**	**0.0544**		**175.8439**	**175.8439**	**5.4700e-003**	**5.3000e-003**	**177.5607**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.5188	0.0000	7.5188	3.8642	0.0000	3.8642			0.0000			0.0000
Off-Road	0.4656	2.0175	20.8690	0.0380		0.0621	0.0621		0.0621	0.0621	0.0000	3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**0.4656**	**2.0175**	**20.8690**	**0.0380**	**7.5188**	**0.0621**	**7.5809**	**3.8642**	**0.0621**	**3.9263**	**0.0000**	**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0793	0.0580	0.6675	1.7400e-003	0.2012	1.1300e-003	0.2023	0.0534	1.0400e-003	0.0544		175.8439	175.8439	5.4700e-003	5.3000e-003	177.5607
Total	**0.0793**	**0.0580**	**0.6675**	**1.7400e-003**	**0.2012**	**1.1300e-003**	**0.2023**	**0.0534**	**1.0400e-003**	**0.0544**		**175.8439**	**175.8439**	**5.4700e-003**	**5.3000e-003**	**177.5607**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.2036	0.0000	9.2036	3.6538	0.0000	3.6538			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265		6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**9.2036**	**1.9853**	**11.1889**	**3.6538**	**1.8265**	**5.4803**		**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0881	0.0644	0.7417	1.9300e-003	0.2236	1.2500e-003	0.2248	0.0593	1.1500e-003	0.0604		195.3821	195.3821	6.0800e-003	5.8900e-003	197.2897
Total	**0.0881**	**0.0644**	**0.7417**	**1.9300e-003**	**0.2236**	**1.2500e-003**	**0.2248**	**0.0593**	**1.1500e-003**	**0.0604**		**195.3821**	**195.3821**	**6.0800e-003**	**5.8900e-003**	**197.2897**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.5204	0.0000	3.5204	1.3976	0.0000	1.3976			0.0000			0.0000
Off-Road	0.7616	3.3000	32.9991	0.0620		0.1015	0.1015		0.1015	0.1015	0.0000	6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**0.7616**	**3.3000**	**32.9991**	**0.0620**	**3.5204**	**0.1015**	**3.6219**	**1.3976**	**0.1015**	**1.4991**	**0.0000**	**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0881	0.0644	0.7417	1.9300e-003	0.2236	1.2500e-003	0.2248	0.0593	1.1500e-003	0.0604		195.3821	195.3821	6.0800e-003	5.8900e-003	197.2897
Total	**0.0881**	**0.0644**	**0.7417**	**1.9300e-003**	**0.2236**	**1.2500e-003**	**0.2248**	**0.0593**	**1.1500e-003**	**0.0604**		**195.3821**	**195.3821**	**6.0800e-003**	**5.8900e-003**	**197.2897**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.5177	12.0752	4.1438	0.0425	1.4223	0.2042	1.6266	0.4096	0.1954	0.6050		4,559.2529	4,559.2529	0.1286	0.6758	4,763.8543
Worker	3.8352	2.8050	32.2997	0.0840	9.7357	0.0545	9.7902	2.5820	0.0502	2.6321		8,508.8894	8,508.8894	0.2646	0.2566	8,591.9661
Total	**4.3529**	**14.8803**	**36.4435**	**0.1265**	**11.1581**	**0.2587**	**11.4168**	**2.9915**	**0.2456**	**3.2371**		**13,068.1423**	**13,068.1423**	**0.3932**	**0.9324**	**13,355.8204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.5177	12.0752	4.1438	0.0425	1.4223	0.2042	1.6266	0.4096	0.1954	0.6050		4,559.2529	4,559.2529	0.1286	0.6758	4,763.8543
Worker	3.8352	2.8050	32.2997	0.0840	9.7357	0.0545	9.7902	2.5820	0.0502	2.6321		8,508.8894	8,508.8894	0.2646	0.2566	8,591.9661
Total	**4.3529**	**14.8803**	**36.4435**	**0.1265**	**11.1581**	**0.2587**	**11.4168**	**2.9915**	**0.2456**	**3.2371**		**13,068.1423**	**13,068.1423**	**0.3932**	**0.9324**	**13,355.8204**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.3718	10.2054	3.6933	0.0415	1.4223	0.1160	1.5383	0.4096	0.1110	0.5206		4,446.4272	4,446.4272	0.1193	0.6584	4,645.6165
Worker	3.5437	2.4575	29.4745	0.0814	9.7357	0.0511	9.7868	2.5820	0.0471	2.6290		8,279.6303	8,279.6303	0.2371	0.2349	8,355.5522
Total	**3.9155**	**12.6629**	**33.1678**	**0.1229**	**11.1581**	**0.1671**	**11.3252**	**2.9915**	**0.1580**	**3.1496**		**12,726.0575**	**12,726.0575**	**0.3564**	**0.8933**	**13,001.1687**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.3718	10.2054	3.6933	0.0415	1.4223	0.1160	1.5383	0.4096	0.1110	0.5206		4,446.4272	4,446.4272	0.1193	0.6584	4,645.6165
Worker	3.5437	2.4575	29.4745	0.0814	9.7357	0.0511	9.7868	2.5820	0.0471	2.6290		8,279.6303	8,279.6303	0.2371	0.2349	8,355.5522
Total	**3.9155**	**12.6629**	**33.1678**	**0.1229**	**11.1581**	**0.1671**	**11.3252**	**2.9915**	**0.1580**	**3.1496**		**12,726.0575**	**12,726.0575**	**0.3564**	**0.8933**	**13,001.1687**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2418	8.2248	3.3683	0.0398	1.4223	0.0588	1.4811	0.4096	0.0562	0.4658		4,270.9160	4,270.9160	0.1105	0.6311	4,461.7532
Worker	3.2807	2.1608	27.0342	0.0788	9.7357	0.0481	9.7838	2.5820	0.0443	2.6262		8,062.0259	8,062.0259	0.2128	0.2160	8,131.7084
Total	**3.5225**	**10.3856**	**30.4025**	**0.1186**	**11.1580**	**0.1069**	**11.2649**	**2.9915**	**0.1005**	**3.0920**		**12,332.9419**	**12,332.9419**	**0.3233**	**0.8471**	**12,593.4615**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.2418	8.2248	3.3683	0.0398	1.4223	0.0588	1.4811	0.4096	0.0562	0.4658		4,270.9160	4,270.9160	0.1105	0.6311	4,461.7532
Worker	3.2807	2.1608	27.0342	0.0788	9.7357	0.0481	9.7838	2.5820	0.0443	2.6262		8,062.0259	8,062.0259	0.2128	0.2160	8,131.7084
Total	**3.5225**	**10.3856**	**30.4025**	**0.1186**	**11.1580**	**0.1069**	**11.2649**	**2.9915**	**0.1005**	**3.0920**		**12,332.9419**	**12,332.9419**	**0.3233**	**0.8471**	**12,593.4615**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694		2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.9511					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9838**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**		**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0565	0.0372	0.4656	1.3600e-003	0.1677	8.3000e-004	0.1685	0.0445	7.6000e-004	0.0452		138.8409	138.8409	3.6600e-003	3.7200e-003	140.0409
Total	**0.0565**	**0.0372**	**0.4656**	**1.3600e-003**	**0.1677**	**8.3000e-004**	**0.1685**	**0.0445**	**7.6000e-004**	**0.0452**		**138.8409**	**138.8409**	**3.6600e-003**	**3.7200e-003**	**140.0409**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2805	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374	0.0000	2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.9511					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2315**	**1.2154**	**17.2957**	**0.0228**		**0.0374**	**0.0374**		**0.0374**	**0.0374**	**0.0000**	**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0565	0.0372	0.4656	1.3600e-003	0.1677	8.3000e-004	0.1685	0.0445	7.6000e-004	0.0452		138.8409	138.8409	3.6600e-003	3.7200e-003	140.0409
Total	**0.0565**	**0.0372**	**0.4656**	**1.3600e-003**	**0.1677**	**8.3000e-004**	**0.1685**	**0.0445**	**7.6000e-004**	**0.0452**		**138.8409**	**138.8409**	**3.6600e-003**	**3.7200e-003**	**140.0409**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	69.5489					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708		281.4481	281.4481	0.0168		281.8690
Total	**69.7405**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**		**281.4481**	**281.4481**	**0.0168**		**281.8690**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.6554	0.4317	5.4006	0.0157	1.9449	9.6100e-003	1.9545	0.5158	8.8400e-003	0.5246		1,610.5540	1,610.5540	0.0425	0.0432	1,624.4745
Total	**0.6554**	**0.4317**	**5.4006**	**0.0157**	**1.9449**	**9.6100e-003**	**1.9545**	**0.5158**	**8.8400e-003**	**0.5246**		**1,610.5540**	**1,610.5540**	**0.0425**	**0.0432**	**1,624.4745**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	69.5489					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0297	0.1288	1.8324	2.9700e-003		3.9600e-003	3.9600e-003		3.9600e-003	3.9600e-003	0.0000	281.4481	281.4481	0.0168		281.8690
Total	**69.5786**	**0.1288**	**1.8324**	**2.9700e-003**		**3.9600e-003**	**3.9600e-003**		**3.9600e-003**	**3.9600e-003**	**0.0000**	**281.4481**	**281.4481**	**0.0168**		**281.8690**

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.6554	0.4317	5.4006	0.0157	1.9449	9.6100e-003	1.9545	0.5158	8.8400e-003	0.5246		1,610.5540	1,610.5540	0.0425	0.0432	1,624.4745
Total	**0.6554**	**0.4317**	**5.4006**	**0.0157**	**1.9449**	**9.6100e-003**	**1.9545**	**0.5158**	**8.8400e-003**	**0.5246**		**1,610.5540**	**1,610.5540**	**0.0425**	**0.0432**	**1,624.4745**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	14.6266	14.6824	116.7457	0.2181	23.6977	0.1691	23.8667	6.3029	0.1574	6.4603		22,396.7406	22,396.7406	1.6802	1.1415	22,778.9089
Unmitigated	14.6266	14.6824	116.7457	0.2181	23.6977	0.1691	23.8667	6.3029	0.1574	6.4603		22,396.7406	22,396.7406	1.6802	1.1415	22,778.9089

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	3,572.47	3,572.47	3572.47	5,682,657	5,682,657
Enclosed Parking with Elevator	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Regional Shopping Center	2,119.62	2,590.26	1502.32	4,539,098	4,539,098
Total	5,692.09	6,162.73	5,074.79	10,221,754	10,221,754

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	4.37	4.37	4.37	100.00	0.00	0.00	100	0	0
Enclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Regional Shopping Center	16.60	8.40	6.90	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.550545	0.057163	0.176442	0.142301	0.027646	0.003370	0.005334	0.008094	0.000262	0.000119	0.025903	0.000447	0.002375
Enclosed Parking with Elevator	0.537785	0.055838	0.172353	0.139003	0.027005	0.007196	0.011392	0.017285	0.000559	0.000254	0.025303	0.000954	0.005071
Parking Lot	0.537785	0.055838	0.172353	0.139003	0.027005	0.007196	0.011392	0.017285	0.000559	0.000254	0.025303	0.000954	0.005071
Regional Shopping Center	0.550545	0.057163	0.176442	0.142301	0.027646	0.003370	0.005334	0.008094	0.000262	0.000119	0.025903	0.000447	0.002375

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.2983	2.5513	1.1031	0.0163		0.2061	0.2061		0.2061	0.2061		3,253.7371	3,253.7371	0.0624	0.0597	3,273.0725
NaturalGas Unmitigated	0.2983	2.5513	1.1031	0.0163		0.2061	0.2061		0.2061	0.2061		3,253.7371	3,253.7371	0.0624	0.0597	3,273.0725

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	27227.6	0.2936	2.5092	1.0678	0.0160		0.2029	0.2029		0.2029	0.2029		3,203.2488	3,203.2488	0.0614	0.0587	3,222.2841
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	429.151	4.6300e-003	0.0421	0.0353	2.5000e-004		3.2000e-003	3.2000e-003		3.2000e-003	3.2000e-003		50.4883	50.4883	9.7000e-004	9.3000e-004	50.7883
Total		**0.2983**	**2.5513**	**1.1031**	**0.0163**		**0.2061**	**0.2061**		**0.2061**	**0.2061**		**3,253.7371**	**3,253.7371**	**0.0624**	**0.0597**	**3,273.0725**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	27.2276	0.2936	2.5092	1.0678	0.0160		0.2029	0.2029		0.2029	0.2029		3,203.2488	3,203.2488	0.0614	0.0587	3,222.2841
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	0.429151	4.6300e-003	0.0421	0.0353	2.5000e-004		3.2000e-003	3.2000e-003		3.2000e-003	3.2000e-003		50.4883	50.4883	9.7000e-004	9.3000e-004	50.7883
Total		**0.2983**	**2.5513**	**1.1031**	**0.0163**		**0.2061**	**0.2061**		**0.2061**	**0.2061**		**3,253.7371**	**3,253.7371**	**0.0624**	**0.0597**	**3,273.0725**

6.0 Area Detail

6.1 Mitigation Measures Area

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	19.6950	10.4024	61.3876	0.0652		1.1041	1.1041		1.1041	1.1041	0.0000	12,541.1224	12,541.1224	0.3383	0.2280	12,617.5340
Unmitigated	19.6950	10.4024	61.3876	0.0652		1.1041	1.1041		1.1041	1.1041	0.0000	12,541.1224	12,541.1224	0.3383	0.2280	12,617.5340

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.4291					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	15.3875					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1.1402	9.7431	4.1460	0.0622		0.7877	0.7877		0.7877	0.7877	0.0000	12,438.0000	12,438.0000	0.2384	0.2280	12,511.9128
Landscaping	1.7383	0.6593	57.2416	3.0300e-003		0.3164	0.3164		0.3164	0.3164		103.1224	103.1224	0.1000		105.6212
Total	**19.6950**	**10.4024**	**61.3876**	**0.0652**		**1.1041**	**1.1041**		**1.1041**	**1.1041**	**0.0000**	**12,541.1224**	**12,541.1224**	**0.3383**	**0.2280**	**12,617.5340**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.4291					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	15.3875					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	1.1402	9.7431	4.1460	0.0622		0.7877	0.7877		0.7877	0.7877	0.0000	12,438.0000	12,438.0000	0.2384	0.2280	12,511.9128
Landscaping	1.7383	0.6593	57.2416	3.0300e-003		0.3164	0.3164		0.3164	0.3164		103.1224	103.1224	0.1000		105.6212
Total	**19.6950**	**10.4024**	**61.3876**	**0.0652**		**1.1041**	**1.1041**		**1.1041**	**1.1041**	**0.0000**	**12,541.1224**	**12,541.1224**	**0.3383**	**0.2280**	**12,617.5340**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix B

City of Ontario
Community Climate Action Plan Screening Table

Instructions for Residential, Commercial, or Industrial Projects

The Screening Table assigns points for each option incorporated into a project as mitigation or a project design feature (collectively referred to as "feature"). The point values correspond to the minimum emissions reduction expected from each feature. The menu of features allows maximum flexibility and options for how development projects can implement the GHG reduction measures. The point levels are based upon improvements compared to 2008 emission levels of efficiency. Projects that garner at least 100 points will be consistent with the reduction quantities anticipated in the City's CAP. As such, those projects that garner a total of 100 points or greater would not require quantification of project specific GHG emissions. Consistent with CEQA Guidelines, such projects would be determined to have a less than significant individual and cumulative impact for GHG emissions.

Instructions for Mixed Use Projects

Mixed use projects provide additional opportunities to reduce emissions by combining complimentary land uses in a manner that can reduce vehicle trips. Mixed use projects also have the potential to complement energy efficient infrastructure in a way that reduces emissions. For mixed use projects, fill out both Screening Table 1 and Table 2, but proportion the points identical to the proportioning of the mix of uses. As an example, a mixed use project that is 50% commercial uses and 50% residential uses will show ½ point for each assigned point value in Table 1 and Table 2. Add the points from both tables. Mixed use Projects that garner at least 100 points will be consistent with the reduction quantities in the City's CAP and are considered less than significant for GHG emissions.

Those projects that do not garnish 100 points using the screening tables will need to provide additional analysis to determine the significance of GHG emissions. Nothing in this guidance shall be construed as limiting the City's authority to adopt a statement of overriding consideration for projects with significant GHG impacts. The following tables provides a menu of performance standards/options related to GHG mitigation measures and design features that can be used to demonstrate consistency with the reduction measures and GHG reduction quantities in the CAP.

Table 1: Screening Table for Implementation of GHG Reduction Measures for Residential Development

Feature	Description	Assigned Point Values	Project Points
Reduction Measure PS E1: Residential Energy Efficiency			
Building Envelope			
Insulation	2008 Baseline (walls R-13:, roof/attic: R-30)	0 points	12
	Modestly Enhanced Insulation (walls R-13:, roof/attic: R-38)	12 points	
	Enhanced Insulation (rigid wall insulation R-13, roof/attic: R-38)	15 points	
	Greatly Enhanced Insulation (spray foam wall insulated walls R-15 or higher, roof/attic R-38 or higher)	18 points	
Windows	2008 Baseline Windows (0.57 U-factor, 0.4 solar heat gain coefficient (SHGC)	0 points	06
	Modestly Enhanced Window Insulation (0.4 U-Factor, 0.32 SHGC)	6 points	
	Enhanced Window Insulation (0.32 U-Factor, 0.25 SHGC)	7 points	
	Greatly Enhanced Window Insulation (0.28 or less U-Factor, 0.22 or less SHGC)	9 points	
Cool Roof	Modest Cool Roof (CRRC Rated 0.15 aged solar reflectance, 0.75 thermal emittance)	10 points	10
	Enhanced Cool Roof(CRRC Rated 0.2 aged solar reflectance, 0.75 thermal emittance)	12 points	
	Greatly Enhanced Cool Roof (CRRC Rated 0.35 aged solar reflectance, 0.75 thermal emittance)	14 points	
Air Infiltration	Minimizing leaks in the building envelope is as important as the insulation properties of the building. Insulation does not work effectively if there is excess air leakage.		10
	Air barrier applied to exterior walls, calking, and visual inspection such as the HERS Verified Quality Insulation Installation (QII or equivalent)	10 points	
	Blower Door HERS Verified Envelope Leakage or equivalent	8 points	
Thermal Storage of Building	Thermal storage is a design characteristic that helps keep a constant temperature in the building. Common thermal storage devices include strategically placed water filled columns, water storage tanks, and thick masonry walls.		
	Modest Thermal Mass (10% of floor or 10% of walls: 12" or more thick exposed concrete or masonry. No permanently installed floor covering such as carpet, linoleum, wood or other insulating materials)	2 points	
	Enhanced Thermal Mass (20% of floor or 20% of walls: 12" or more thick exposed concrete or masonry. No permanently installed floor covering such as carpet, linoleum, wood or other insulating materials)	4 points	

Feature	Description	Assigned Point Values	Project Points
Indoor Space Efficiencies			
Heating/ Cooling Distribution System	Minimum Duct Insulation (R-4.2 required)	0 points	07
	Modest Duct insulation (R-6)	7 points	
	Enhanced Duct Insulation (R-8)	8 points	
	Distribution loss reduction with inspection (HERS Verified Duct Leakage or equivalent)	12 points	
Space Heating/ Cooling Equipment	2008 Minimum HVAC Efficiency (SEER 13/60% AFUE or 7.7 HSPF)	0 points	04
	Improved Efficiency HVAC (SEER 14/65% AFUE or 8 HSPF)	4 points	
	High Efficiency HVAC (SEER 15/72% AFUE or 8.5 HSPF)	7 points	
	Very High Efficiency HVAC (SEER 16/80% AFUE or 9 HSPF)	9 points	
Water Heaters	2008 Minimum Efficiency (0.57 Energy Factor)	0 points	12
	Improved Efficiency Water Heater (0.675 Energy Factor)	12 points	
	High Efficiency Water Heater (0.72 Energy Factor)	15 points	
	Very High Efficiency Water Heater (0.92 Energy Factor)	18 points	
	Solar Pre-heat System (0.2 Net Solar Fraction)	4 points	
	Enhanced Solar Pre-heat System (0.35 Net Solar Fraction)	8 points	
Daylighting	Daylighting is the ability of each room within the building to provide outside light during the day reducing the need for artificial lighting during daylight hours.		01
	All peripheral rooms within the living space have at least one window (required)	0 points	
	All rooms within the living space have daylight (through use of windows, solar tubes, skylights, etc.)	1 points	
	All rooms daylighted	2 points	
Artificial Lighting	2008 Minimum (required)	0 points	08
	Efficient Lights (25% of in-unit fixtures considered high efficacy. High efficacy is defined as 40 lumens/watt for 15 watt or less fixtures; 50 lumens/watt for 15-40 watt fixtures, 60 lumens/watt for fixtures >40watt)	8 points	
	High Efficiency Lights (50% of in-unit fixtures are high efficacy)	10 points	
	Very High Efficiency Lights (100% of in-unit fixtures are high efficacy)	12 points	
Appliances	Energy Star Refrigerator (new)	1 points	01
	Energy Star Dish Washer (new)	1 points	01
	Energy Star Washing Machine (new)	1 points	01

Feature	Description	Assigned Point Values	Project Points
Miscellaneous Residential Building Efficiencies			
Building Placement	North/South alignment of building or other building placement such that the orientation of the buildings optimizes natural heating, cooling, and lighting.	5 point	
Shading	At least 90% of south-facing glazing will be shaded by vegetation or overhangs at noon on Jun 21st.	4 Points	
Energy Star Homes	EPA Energy Star for Homes (version 3 or above)	25 points	
Independent Energy Efficiency Calculations	Provide point values based upon energy efficiency modeling of the Project. Note that engineering data will be required documenting the energy efficiency and point values based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	
Other	This allows innovation by the applicant to provide design features that increases the energy efficiency of the project not provided in the table. Note that engineering data will be required documenting the energy efficiency of innovative designs and point values given based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	
Existing Residential Retrofits	The applicant may wish to provide energy efficiency retrofit projects to existing residential dwelling units to further the point value of their project. Retrofitting existing residential dwelling units within the City is a key reduction measure that is needed to reach the reduction goal. The potential for an applicant to take advantage of this program will be decided on a case by case basis and must have the approval of the Ontario Planning Department. The decision to allow applicants to ability to participate in this program will be evaluated based upon, but not limited to the following; Will the energy efficiency retrofit project benefit low income or disadvantaged residents? Does the energy efficiency retrofit project fit within the overall assumptions in reduction measures associated with existing residential retrofits? Does the energy efficiency retrofit project provide co-benefits important to the City? Point value will be determined based upon engineering and design criteria of the energy efficiency retrofit project.	TBD	
Reduction Measure PS E2: Residential Renewable Energy Generation			
Photovoltaic	Solar Photovoltaic panels installed on individual homes or in collective neighborhood arrangements such that the total power provided augments:		
	Solar Ready Homes (sturdy roof and solar ready service panel)	2 points	
	10 percent of the power needs of the project	10 points	
	20 percent of the power needs of the project	15 points	
	30 percent of the power needs of the project	20 points	
	40 percent of the power needs of the project	28 points	
	50 percent of the power needs of the project	35 points	
	60 percent of the power needs of the project	38 points	
	70 percent of the power needs of the project	42 points	
	80 percent of the power needs of the project	46 points	

Feature	Description	Assigned Point Values	Project Points
	90 percent of the power needs of the project	52 points	
	100 percent of the power needs of the project	58 points	
Wind turbines	Some areas of the City lend themselves to wind turbine applications. Analysis of the area's capability to support wind turbines should be evaluated prior to choosing this feature. Individual wind turbines at homes or collective neighborhood arrangements of wind turbines such that the total power provided augments:		
	10 percent of the power needs of the project	10 points	
	20 percent of the power needs of the project	15 points	
	30 percent of the power needs of the project	20 points	
	40 percent of the power needs of the project	28 points	
	50 percent of the power needs of the project	35 points	
	60 percent of the power needs of the project	38 points	
	70 percent of the power needs of the project	42 points	
	80 percent of the power needs of the project	46 points	
	90 percent of the power needs of the project	52 points	
	100 percent of the power needs of the project	58 points	
Off-site renewable energy project	The applicant may submit a proposal to supply an off-site renewable energy project such as renewable energy retrofits of existing homes that will help implement renewable energy within the City. These off-site renewable energy retrofit project proposals will be determined on a case by case basis and must be accompanied by a detailed plan that documents the quantity of renewable energy the proposal will generate. Point values will be determined based upon the energy generated by the proposal.	TBD	
Other Renewable Energy Generation	The applicant may have innovative designs or unique site circumstances (such as geothermal) that allow the project to generate electricity from renewable energy not provided in the table. The ability to supply other renewable energy and the point values allowed will be decided based upon engineering data documenting the ability to generate electricity.	TBD	
Reduction Measure PS W1: Residential Water Conservation			
Irrigation and Landscaping			
Water Efficient Landscaping	Limit conventional turf to < 50% of required landscape area	0 points	08
	Limit conventional turf to < 25% of required landscape area	4 points	
	No conventional turf (warm season turf to < 50% of required landscape area and/or low water using plants are allowed)	6 points	
	Only California Native Plants that requires no irrigation or some supplemental irrigation	8 points	

Feature	Description	Assigned Point Values	Project Points
Water Efficient irrigation systems	Low precipitation spray heads < .75"/hr or drip irrigation Weather based irrigation control systems or moisture sensors (demonstrate 20% reduced water use)	2 point 3 points	02
Recycled Water	Recycled connections (purple pipe) to irrigation system on site	6 points	
Water Reuse	Gray water Reuse System collects Gray water from clothes washers, showers and faucets for irrigation use,	12 points	
Storm water Reuse Systems	Innovative on-site stormwater collection, filtration and reuse systems are being developed that provide supplemental irrigation water and provide vector control. These systems can greatly reduce the irrigation needs of a project. Point values for these types of systems will be determined based upon design and engineering data documenting the water savings.	TBD	As required by LID
Potable Water			
Showers	Water Efficient Showerheads (2.0 gpm)	3 points	03
Toilets	Water Efficient Toilets (1.5 gpm)	3 points	03
Faucets	Water Efficient faucets (1.28 gpm)	3 points	03
Dishwasher	Water Efficient Dishwasher (6 gallons per cycle or less)	1	01
Washing Machine	Water Efficient Washing Machine (Water factor <5.5)	1	01
WaterSense	EPA WaterSense Certification	12 points	
Reduction Measure PS T1: Land Use Based Trips and VMT Reduction			
Mixed Use	Mixes of land uses that complement one another in a way that reduces the need for vehicle trips can greatly reduce GHG emissions. The point value of mixed use projects will be determined based upon a Transportation Impact Analysis (TIA) demonstrating trip reductions and/or reductions in vehicle miles traveled. Suggested ranges: Diversity of land uses complementing each other (2-28 points) Increased destination accessibility other than transit (1-18 points) Increased transit accessibility (1-25 points) Infill location that reduces vehicle trips or VMT beyond the measures described above (points TBD based on traffic data).	TBD	
Residential Near Local Retail (Residential only Projects)	Having residential developments within walking and biking distance of local retail helps to reduce vehicle trips and/or vehicle miles traveled. The point value of residential projects in close proximity to local retail will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled (VMT)	TBD	

Feature	Description	Assigned Point Values	Project Points
Other Trip Reduction Measures	Other trip or VMT reduction measures not listed above with TIA and/or other traffic data supporting the trip and/or VMT for the project.	TBD	
Reduction Measure PS T2: Bicycle Master Plan			
Bicycle Infrastructure	Ontario's Bicycle Master Plan is extensive and describes the construction on 11.5 miles of Class I bike paths and 23 miles of Class II and Class III bikeways to build upon the current 8 miles of bikeways. Provide bicycle paths within project boundaries. Provide bicycle path linkages between residential and other land uses. Provide bicycle path linkages between residential and transit.	TBD 2 points 5 points	
Reduction Measure PS T3: Neighborhood Electric Vehicle Infrastructure			
Electric Vehicle Recharging	Provide circuit and capacity in garages of residential units for use by an electric vehicle. Charging stations are for on-road electric vehicles legally able to drive on all roadways including Interstate Highways and freeways. Install electric vehicle charging stations in the garages of residential units	1 point 8 points	08
Total Points Earned by Residential Project:			102

Without VMT or Mixed Use

Table 2: Screening Table for Implementation of GHG Reduction Measures for Commercial/Industrial Development

Feature	Description	Assigned Point Values	Project Points
Reduction Measure PS E3: Commercial/Industrial Energy Efficiency Development			
Building Envelope			
Insulation	2008 baseline (walls R-13; roof/attic R-30)	0 points	18
	Modestly Enhanced Insulation (walls R-13, roof/attic R-38))	15 points	
	Enhanced Insulation (rigid wall insulation R-13, roof/attic R-38)	18 points	
	Greatly Enhanced Insulation (spray foam insulated walls R-15 or higher, roof/attic R-38 or higher)	20 points	
	(Applies to the conditioned space, defined as those areas within the building that have air conditioning and heating.)		
Windows	2008 Baseline Windows (0.57 U-factor, 0.4 solar heat gain coefficient [SHGC])	0 points	07
	Modestly Enhanced Window Insulation (0.4 U-factor, 0.32 SHGC)	7 points	
	Enhanced Window Insulation (0.32 U-factor, 0.25 SHGC)	8 points	
	Greatly Enhanced Window Insulation (0.28 or less U-factor, 0.22 or less SHGC)	12 points	
	(Applies to the conditioned space, defined as those areas within the building that have air conditioning and heating.)		
Cool Roof	Modest Cool Roof (CRRC Rated 0.15 aged solar reflectance, 0.75 thermal emittance)	12 points	12
	Enhanced Cool Roof (CRRC Rated 0.2 aged solar reflectance, 0.75 thermal emittance)	14 points	
	Greatly Enhanced Cool Roof (CRRC Rated 0.35 aged solar reflectance, 0.75 thermal emittance)	16 points	
Air Infiltration	Minimizing leaks in the building envelope is as important as the insulation properties of the building. Insulation does not work effectively if there is excess air leakage.		12
	Air barrier applied to exterior walls, calking, and visual inspection such as the HERS Verified Quality Insulation Installation (QII or equivalent)	12 points	
	Blower Door HERS Verified Envelope Leakage or equivalent	10 points	
	(Applies to the conditioned space, defined as those areas within the building that have air conditioning and heating.)		
Thermal Storage of Building	Thermal storage is a design characteristic that helps keep a constant temperature in the building. Common thermal storage devices include strategically placed water filled columns, water storage tanks, and thick masonry walls.		

Feature	Description	Assigned Point Values	Project Points
	Modest Thermal Mass (10% of floor or 10% of walls 12" or more thick exposed concrete or masonry with no permanently installed floor covering such as carpet, linoleum, wood or other insulating materials)	4 points	04
	Enhanced Thermal Mass (20% of floor or 20% of walls 12" or more thick exposed concrete or masonry with no permanently installed floor covering such as carpet, linoleum, wood or other insulating materials)	6 points	
	Enhanced Thermal Mass (80% of floor or 80% of walls 12" or more thick exposed concrete or masonry with no permanently installed floor covering such as carpet, linoleum, wood or other insulating materials)	24 points	
Indoor Space Efficiencies			
Heating/ Cooling Distribution System	Minimum Duct Insulation (R-4.2 required)	0 points	08
	Modest Duct insulation (R-6)	8 points	
	Enhanced Duct Insulation (R-8)	10 points	
	Distribution loss reduction with inspection (HERS Verified Duct Leakage or equivalent) *(Applies to the conditioned space, defined as those areas within the building that have air conditioning and heating.)*	14 points	
Space Heating/ Cooling Equipment	2008 Minimum HVAC Efficiency (EER 13/60% AFUE or 7.7 HSPF)	0 points	07
	Improved Efficiency HVAC (EER 14/65% AFUE or 8 HSPF)	7 points	
	High Efficiency HVAC (EER 15/72% AFUE or 8.5 HSPF)	8 points	
	Very High Efficiency HVAC (EER 16/80% AFUE or 9 HSPF) *(Applies to the conditioned space, defined as those areas within the building that have air conditioning and heating.)*	12 points	
Commercial Heat Recovery Systems	Heat recovery strategies employed with commercial laundry, cooking equipment, and other commercial heat sources for reuse in HVAC air intake or other appropriate heat recovery technology. Point values for these types of systems will be determined based upon design and engineering data documenting the energy savings.	TBD	
Water Heaters	2008 Minimum Efficiency (0.57 Energy Factor)	0 points	14
	Improved Efficiency Water Heater (0.675 Energy Factor)	14 points	
	High Efficiency Water Heater (0.72 Energy Factor)	16 points	
	Very High Efficiency Water Heater (0.92 Energy Factor)	19 points	
	Solar Pre-heat System (0.2 Net Solar Fraction)	4 points	
	Enhanced Solar Pre-heat System (0.35 Net Solar Fraction)	8 points	
Daylighting	Daylighting is the ability of each room within the building to provide outside light during the day reducing the need for artificial lighting during daylight hours.		

Feature	Description	Assigned Point Values	Project Points
	All peripheral rooms within building have at least one window or skylight	1 points	
	All rooms within building have daylight (through use of windows, solar tubes, skylights, etc.)	5 points	05
	All rooms daylighted	7 points	
Artificial Lighting	2008 Minimum (required)	0 points	
	Efficient Lights (25% of in-unit fixtures considered high efficacy. High efficacy is defined as 40 lumens/watt for 15 watt or less fixtures; 50 lumens/watt for 15-40 watt fixtures, 60 lumens/watt for fixtures >40watt)	9 points	09
	High Efficiency Lights (50% of in-unit fixtures are high efficacy)	12 points	
	Very High Efficiency Lights (100% of in-unit fixtures are high efficacy)	14 points	
Appliances	Energy Star Commercial Refrigerator (new)	4 points	
	Energy Star Commercial Dish Washer (new)	4 points	12
	Energy Star Commercial Cloths Washing	4 points	
Miscellaneous Commercial/Industrial Building Efficiencies			
Building Placement	North/South alignment of building or other building placement such that the orientation of the buildings optimizes conditions for natural heating, cooling, and lighting.	6 point	
Shading	At least 90% of south-facing glazing will be shaded by vegetation or overhangs at noon on June 21st.	6 Points	
Other	This allows innovation by the applicant to provide design features that increases the energy efficiency of the project not provided in the table. Note that engineering data will be required documenting the energy efficiency of innovative designs and point values given based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	
Existing Commercial building Retrofits	The applicant may wish to provide energy efficiency retrofit projects to existing commercial buildings to further the point value of their project. Retrofitting existing commercial buildings within the City is a key reduction measure that is needed to reach the reduction goal. The potential for an applicant to take advantage of this program will be decided on a case by case basis and must have the approval of the Ontario Planning Department. The decision to allow applicants the ability to participate in this program will be evaluated based upon, but not limited to the following:	TBD	

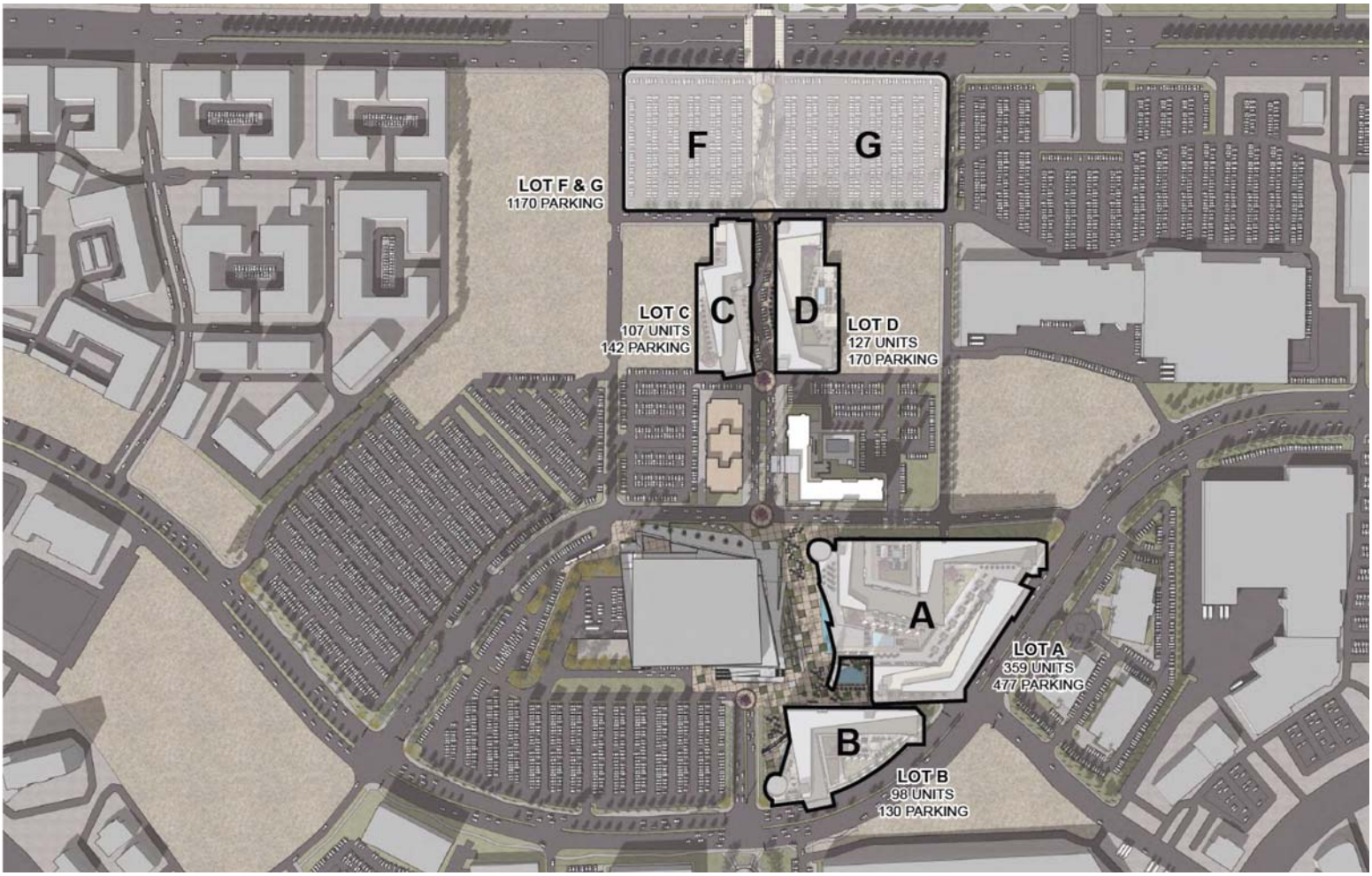
Feature	Description	Assigned Point Values	Project Points
	Will the energy efficiency retrofit project benefit low income or disadvantaged communities? Does the energy efficiency retrofit project fit within the overall assumptions in the reduction measure associated with commercial building energy efficiency retrofits? Does the energy efficiency retrofit project provide co-benefits important to the City? Point value will be determined based upon engineering and design criteria of the energy efficiency retrofit project.		
Reduction Measure PS E4: Commercial/Industrial Renewable Energy			
Photovoltaic	Solar Photovoltaic panels installed on commercial buildings or in collective arrangements within a commercial development such that the total power provided augments:		
	Solar Ready Roofs (sturdy roof and electric hookups)	2 points	
	10 percent of the power needs of the project	8 points	
	20 percent of the power needs of the project	14 points	
	30 percent of the power needs of the project	20 points	
	40 percent of the power needs of the project	26 points	
	50 percent of the power needs of the project	32 points	
	60 percent of the power needs of the project	38 points	
	70 percent of the power needs of the project	44 points	
	80 percent of the power needs of the project	50 points	
	90 percent of the power needs of the project	56 points	
	100 percent of the power needs of the project	60 points	
Wind turbines	Some areas of the City lend themselves to wind turbine applications. Analysis of the areas capability to support wind turbines should be evaluated prior to choosing this feature. Wind turbines as part of the commercial development such that the total power provided augments:		
	10 percent of the power needs of the project	8 points	
	20 percent of the power needs of the project	14 points	
	30 percent of the power needs of the project	20 points	
	40 percent of the power needs of the project	26 points	
	50 percent of the power needs of the project	32 points	
	60 percent of the power needs of the project	38 points	
	70 percent of the power needs of the project	44 points	

Feature	Description	Assigned Point Values	Project Points
	80 percent of the power needs of the project 90 percent of the power needs of the project 100 percent of the power needs of the project	50 points 56 points 60 points	
Off-site renewable energy project	The applicant may submit a proposal to supply an off-site renewable energy project such as renewable energy retrofits of existing commercial/industrial that will help implement reduction measures associated with existing buildings. These off-site renewable energy retrofit project proposals will be determined on a case by case basis accompanied by a detailed plan documenting the quantity of renewable energy the proposal will generate. Point values will be based upon the energy generated by the proposal.	TBD	
Other Renewable Energy Generation	The applicant may have innovative designs or unique site circumstances (such as geothermal) that allow the project to generate electricity from renewable energy not provided in the table. The ability to supply other renewable energy and the point values allowed will be decided based upon engineering data documenting the ability to generate electricity.	TBD	
Reduction Measure PS W2: Commercial/Industrial Water Conservation			
Irrigation and Landscaping			
Water Efficient Landscaping	Eliminate conventional turf from landscaping Only moderate water using plants Only low water using plants Only California Native landscape that requires no or only supplemental irrigation	0 points 3 points 4 points 8 points	08
Trees	Increase tree planting in parking areas 50% beyond City Code requirements	TBD	
Water Efficient irrigation systems	Low precipitation spray heads< .75"/hr or drip irrigation Weather based irrigation control systems combined with drip irrigation (demonstrate 20 reduced water use)	1 point 5 points	01
Recycled Water	Recycled water connection (purple pipe)to irrigation system on site	5 points	
Storm water Reuse Systems	Innovative on-site stormwater collection, filtration and reuse systems are being developed that provide supplemental irrigation water and provide vector control. These systems can greatly reduce the irrigation needs of a project. Point values for these types of systems will be determined based upon design and engineering data documenting the water savings.	TBD	

Feature	Description	Assigned Point Values	Project Points
Potable Water			
Showers	Water Efficient Showerheads (2.0 gpm)	3 points	
Toilets	Water Efficient Toilets/Urinals (1.5gpm) Waterless Urinals (note that commercial buildings having both waterless urinals and high efficiency toilets will have a combined point value of 6 points)	3 points 4 points	07
Faucets	Water Efficient faucets (1.28gpm)	3 points	03
Commercial Dishwashers	Water Efficient dishwashers (20% water savings)	4 points	04
Commercial Laundry Washers	Water Efficient laundry (15% water savings) High Efficiency laundry Equipment that captures and reuses rinse water (30% water savings)	3 points 6 points	
Commercial Water Operations Program	Establish an operational program to reduce water loss from pools, water features, etc., by covering pools, adjusting fountain operational hours, and using water treatment to reduce draw down and replacement of water. Point values for these types of plans will be determined based upon design and engineering data documenting the water savings.	TBD	
Reduction Measure PS T1: Land Use Based Trips and VMT Reduction			
Mixed Use	Mixes of land uses that complement one another in a way that reduces the need for vehicle trips can greatly reduce GHG emissions. The point value of mixed use projects will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled	TBD	
Local Retail Near Residential (Commercial only Projects)	Having residential developments within walking and biking distance of local retail helps to reduce vehicle trips and/or vehicle miles traveled. The point value of residential projects in close proximity to local retail will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled	TBD	
Reduction Measure PS T2: Bicycle Master Plan			
Bicycle Infrastructure	Ontario's Bicycle Master Plan is extensive and describes the construction on 11.5 miles of Class I bike paths and 23 miles of Class II and Class III bikeways to build upon the current 8 miles of bikeways. Provide bicycle paths within project boundaries. Provide bicycle path linkages between project site and other land uses. Provide bicycle path linkages between project site and transit.	TBD TBD 2 points 5 points	

Feature	Description	Assigned Point Values	Project Points
Reduction Measure PS T3: Electric Vehicle Infrastructure			
Electric Vehicles	Provide public charging station for use by an electric vehicle. *(ten points for each charging station within the facility)*	10 points	10
Reduction Measure PS T4: Employee Based Trip &VMT Reduction Policy			
Compressed Work Week	Reduce the number of days per week that employees need to be on site will reduce the number of vehicle trips associated with commercial/industrial development. Compressed work week such that full time employees are on site: 5 days per week 4 days per week on site 3 days per week on site	TBD	
Car/Vanpools	Car/vanpool program Car/vanpool program with preferred parking Car/vanpool with guaranteed ride home program Subsidized employee incentive car/vanpool program Combination of all the above	TBD	
Employee Bicycle/ Pedestrian Programs	Complete sidewalk to residential within ½ mile Complete bike path to residential within 3 miles Bike lockers and secure racks Showers and changing facilities Subsidized employee walk/bike program (Note combine all applicable points for total value)	TBD	
Shuttle/Transit Programs	Local transit within ¼ mile Light rail transit within ½ mile Shuttle service to light rail transit station Guaranteed ride home program Subsidized Transit passes Note combine all applicable points for total value	TBD	
CRT	Employer based Commute Trip Reduction (CRT). CRTs apply to commercial, offices, or industrial projects that include a reduction of vehicle trip or VMT goal using a variety of employee commutes trip reduction methods. The point value will be determined based upon a TIA that demonstrates the trip/VMT reductions. Suggested point ranges: Incentive based CRT Programs (1-8 points) Mandatory CRT programs (5-20 points)	TBD	
Other Trip Reductions	Other trip or VMT reduction measures not listed above with TIA and/or other traffic data supporting the trip and/or VMT for the project.	TBD	
Total Points from Commercial/Industrial Project:			141

TOYOTA ARENA MIXED-USE DEVELOPMENT
ENERGY CONSERVATION ANALYSIS
City of Ontario



TOYOTA ARENA MIXED-USE DEVELOPMENT
ENERGY CONSERVATION ANALYSIS
City of Ontario, California

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June 4, 2021

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1.0 Introduction

1.1 Purpose of Report and Study Objectives

The purpose of this energy conservation analysis is to review the energy implications of the proposed Toyota Arena Mixed-Use Development (project) and provide recommendations to reduce wasteful, inefficient and unnecessary consumption of energy during construction and operation. This analysis has been prepared within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.).

CEQA Guidelines, Appendix F, Energy Conservation, describes the framework within which energy conservation should be analyzed. Conserving energy implies the wise and efficient use of energy through decreasing overall per capita energy consumption, decreasing reliance on fossil fuels (such as coal, natural gas and oil), and increasing reliance on renewable energy sources. This analysis considers energy impacts to include:

1. The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project including construction and operation.

2. The effects of the project on local and regional energy supplies and on requirements for additional capacity.

3. The effects of the project on peak and base period demands for electricity and other forms of energy.

4. The degree to which the project complies with existing energy standards.

5. The effects of the project on energy resources.

1.2 Site Location

The proposed project site is located adjacent to the Toyota Arena, north of Concourse Street and south of Fourth Street, in the City of Ontario.

The project site is located with Ontario Center Specific Plan and zoned for Urban Commercial within the Specific Plan. The City of Ontario General Plan land use map designates the project site as Mixed Use.

The project location map is provided in Exhibit A.

1.3 Project Description

The project consists of construction and operation of a mixed use town center development with residential and commercial/retail land use within four development lots.

The proposed project includes a total of 691 residential dwelling units, 71,200 square feet of commercial/retail uses and the demolition and relocation of approximately 1,170 surface parking spaces. The total project site area is approximately 18.73 acres.

The site plan used for this analysis, provided by the applicant, is illustrated in Exhibit B. Table 1 summarizes the land use assumptions used for this analysis.

Table 1
Land Use Summary

Lot	Dwelling Units	Retail (SF)[1]	Parking Spaces
A	359	25,256	477[2]
B	98	20,802	130[2]
C	107	11,047	142[2]
D	127	14,095	170[2]
E & F	--	--	1,170
Total	691	71,200	2,089

[1] S.F. – Square Feet
[2] Parking Structure

The site plan used in this analysis was provided by the applicant, and is illustrated in Exhibit B.

1.4 Utility Providers

The project will be served by the following utility providers, as shown in Table 2.

Table 2
Utility Providers

Utility	Provider
Electricity	Southern California Edison
Natural Gas	Southern California Gas Company
Water	Ontario Public Works & OMUC
Sewer	Ontario Public Works & OMUC
Telephone	Frontier Communications
Cable	Frontier Communications

1.5 Summary of CEQA Impacts

Table 3 provides a summary of the project's impact to Energy resources, per the impact criteria described in CEQA Guidelines, Appendix G.

Table 3
CEQA Energy Impact Criteria

Energy Impact Criteria	Potentially Significant	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?			X	
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?			X	

1.6 Project Design Features

The following project design features are considered standard building code requirements and best practices that will be included in the project design to will help reduce energy consumption. Design features are not typically considered mitigation under CEQA.

Construction Design Features

DF-1 Establish an electricity supply to the construction site and use electric powered equipment instead of diesel-powered equipment or generators, where feasible.

Operational Design Features

DF-2 Implement the GHG Reduction Measures from the Ontario County Climate Action Plan (CAP) Screening Tables to achieve at least 100 points, per the requirements for Mixed Use Projects.

DF-3 Comply with the mandatory requirements of California Building Standards Code Title 24 Part 6 (Energy Code) and Title 24 Part 11 (CAL Green).

DF-4 Implement water conservation strategies, including low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and limit the amount of turf/sod, per CAL Green and City of Ontario requirements.

DF-5 Implement zero waste strategies, recycling and composting programs for residential and non-residential uses.

DF-6 Encourage residents and landscape maintenance crews to use electric landscaping equipment, such as lawn mowers and leaf blowers, wherever feasible.

DF-7 No natural gas or wood burning fireplaces shall be installed in any residential dwelling.

DF-8 Implement trip reduction measures that reduce the number of auto-based trips and encourage the use of transit, bicycling, and walking. Such as;

1. Improve the walkability and design of the project by including pedestrian and bicycling connections within the project site and to adjacent off-site facilities (i.e. sidewalks, crosswalks, foot paths, protected bike lanes, multi-purpose trails, direct parcel-to-parcel connections, wayfinding signage, etc.).

2. Provide traffic calming measures (i.e. marked crosswalks, raised crosswalks, raised intersections, count-down signal timers, curb extensions, speed tables, median islands, tight corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, etc.)

3. Provide bicycle racks for the retail and commercial uses and secure bicycle parking areas for the office and residential uses.

DF-9 Provide electric vehicle charging stations per the requirements of CALGreen.

2.0 Regulatory Setting

Energy is controlled through various federal and state laws and regulations. This section provides a brief overview of key energy legislation and policies at the federal and state levels over the past 50 years.

2.1 Federal Regulations

Table 4
U.S. Energy Policy Legislative Acts

Date	Legislative Act and Description
1975	**Energy Policy and Conservation Act** Established the Strategic Petroleum Reserve and mandated vehicle fuel economy standards
1978	**National Energy Act** Established tax incentives and disincentives, alternative fuel programs, energy efficiency initiatives, and other regulatory and market-based initiatives in response to the oil crisis earlier in the decade. Comprised of 5 statutes: **Energy Tax Act** Created the Gas Guzzler tax for vehicles with mileage below specified levels and offered income tax credit for citizens using solar, wind, or geothermal energy sources at home **Natural Gas Policy Act** Set up wellhead pricing maximums, rules for allocating costs of high-cost gas to industrial consumers, and provided authority to high priority users in times of supply emergency; gave FERC jurisdiction over almost all natural gas production **National Energy Conservation Policy Act** Replaced Minimum Energy Performance Standards (MEPS) set forth in the EPCA of 1975, changed energy standards from voluntary to mandatory, Required federal agencies to do energy audits of their operations, Provided loans for families to purchase solar heating or cooling systems, and Established grants for schools, hospitals, local governments, and public housing authorities willing to use energy conservation measures **Power Plant and Industrial Fuel Use Act** Restricted construction of power plants fueled primarily by oil or natural gas and instead encouraged power plants fueled by coal, nuclear, and alternative fuels and restricted use of oil and natural gas in industrial boilers. Repealed in 1987 with the Natural Gas Utilization Act **Public Utility Regulatory Policies Act** Promoted use of renewable energy, encouraged cogeneration plants.
1980	**Energy Security Act** Title I: US Synthetic Fuels Corporation Act Established the Synthetic Fuels Corporation (which only existed until 1985) for the purpose of partnering with industry for the creation of a market for domestically-produced synthetic liquid fuels; moved research and development for synthetic fuels away from the Department of Energy and into this public-private partnership with the hopes of speeding up results. Title II: Biomass Energy and Alcohol Fuels Act Provided loan guarantees for small-scale biomass energy projects; established the Office of Alcohol Fuels, the Office of Energy from Municipal Waste.

Table 4
U.S. Energy Policy Legislative Acts

Date	Legislative Act and Description
	Title III: Energy Targets Required the submission of energy targets for net imports. Title IV: Renewable Initiatives Established incentives for the use of renewable energy resources Title V: Solar Energy and Energy Conservation Encouraged energy conservation and the use of solar energy, reducing dependence on foreign energy supplies. Title VI: Geothermal Energy Act Authorized loans from the Geothermal Resources Development Fund for exploration and determination of economic viability of a geothermal reservoir, cancels loan if reservoir is deemed unacceptable for development. Title VII: Acid Precipitation Program Established a task force to study the causes and risks of acid precipitation Title VIII: Strategic Petroleum Reserve Established that 500,000,000 barrels of crude oil must be in storage before any can be sold and calls for the reserve to increase its supply 100,000 barrels per day until the storage capacity is reached
1992	**Energy Policy Act** Amended the National Energy Conservation Policy Act of 1978. Created framework for wholesale electricity generation. Provided financial incentives to users/developers of clean-fuel vehicles; repealed alternative minimum tax for some producers. Intended to expand the use of natural gas.
2002	**Farm Security and Rural Investment Act (Farm Bill)** Included $405 million in mandatory funding over the following 5 years for the procurement of bio-based products, grants and loans for renewable energy and energy efficiency projects, research and development and the bioenergy program. Included, for reasons of national energy and security, rural economic development, and environmental sustainability in light of climate change impacts.
2005	**Energy Policy Act** Offers tax benefits to individuals who increase energy efficiency in existing homes, buy or lease hybrid/alternative vehicles, required all public utilities to offer net metering on request, increased required amounts of renewable fuel in gasoline sold in the US, and encourages more domestic energy production
2007	**Energy Independence and Security Act** Increased CAFE standards to 35 mpg (fleet-wide for passenger autos and light trucks) by 2020; instituted new conservation measures for federal fleet vehicles; authorized increased taxpayer-funded biofuel production (36 billion gallons by 2022 - 21 billion of which must be derived from non-cornstarch products). Revised standards for appliances and lighting; all federal buildings must use Energy Star lighting products; training for green jobs; loans for small business energy efficiency improvements.
2008	**Food, Conservation, and Energy Act (Farm Bill)** Includes provisions for loan guarantees for bio-refineries, payments to support expansion of advanced biofuels, expands the existing Rural Energy for America Program, provides grant monies for biofuel and bio-based product research and development
2009	**The American Recovery and Reinvestment Act of 2009**

Table 4
U.S. Energy Policy Legislative Acts

Date	Legislative Act and Description
	$800 billion economic stimulus package aimed at job creation and the promotion of investment and consumer spending; included $4.3 billion in tax credits to homeowners for energy efficiency improvements in 2009-2010, $300 million for reducing diesel engine emissions, $21.5 billion for energy infrastructure, $27.2 billion for energy efficiency and renewable energy research and investment, $2 billion in research for DOE, $600 million in research for NOAA
2015	**The Clean Power Plan** The first comprehensive plan to reduce carbon emissions from power plants by 32% in 2030, compared to 2005 levels. The plan was repealed under the Trump Administration. The Biden Administration has recently said it will not try to resurrect the plan, but will instead be proposing a new rule aimed at limiting GHG emissions from power plants.

[1] Source: Robinson, Brandi. Penn State University. https://www.e-education.psu.edu/geog432/node/116

2.2 State of California Regulations

California has a long-standing history of support for energy conservation and renewable energy.

Table 5 provides a summary of some of the key legislative acts, policies and regulations in the State of California for encouraging energy conservation and renewable energy.

Table 5
California Energy Policy Legislative Acts and Regulations

Date	Legislative Act and Description
1974	**Warren-Alquist Act** Established the California Energy Commission (CEC) as the state's primary energy policy and planning agency. Responsible for preparing State Energy Plan. CEC's goals are to reduce energy costs and environmental impacts of energy use, while ensuring a safe, resilient, and reliable supply of energy.
1978	**Title 24 of the California Code of Regulations** Establishes the Renewable Portfolio Standard (RPS) program, requiring 20% of retail sales from renewable energy by 2017.
2002	**Senate Bill 1078** Required 20% of retail sales from renewable energy by 2017.
2003	**Energy Action Plan I** Accelerated the 20% renewable deadline to 2010.
2005	**Energy Action Plan II** Recommended further goal of 33% renewable by 2020.
2006	**Senate Bill 107** Codified the accelerated 20% renewable by 2010 deadline into law.
2008	**Executive Order S-14-08** Signed by Gov. Schwarzenegger, requires 33% renewables by 2020.
2009	**Executive Order S-21-09** Directs the California Air Resources Board, under its AB 32 authority, to adopt regulations by July 31, 2010, consistent with the 33% renewable energy target established in Executive Order S-14-08.
2011	**Senate Bill X1-2** Signed by Gov. Edmund G. Brown, Jr., codifies 33% renewable by 2020 RPS
2015	**Senate Bill 350 – Clean Energy and Pollution Reduction Act of 2015** Signed by Gov. Edmund G. Brown, Jr. codifies 50% by 2030 RPS
2018	**Senate Bill 100** Signed by Gov. Edmund G. Brown, Jr. codifies 60% by 2030 & 100% by 2045 RPS

[1] Source: California Energy Commission. https://www.energy.ca.gov/renewables/index.html

3.0 Project Energy Consumption

3.1 Energy Consumption Methodology

The three (3) main types of energy expected to be consumed by the project include electricity, natural gas and petroleum products in the form of gasoline and diesel fuel. Energy usage for the proposed project is calculated based on the *CalEEMod* and *Toyota Arena Mixed Use Development Air Quality and Greenhouse Gas Analysis, prepared by RK Engineering Group, Inc., dated June 2021* (Air/GHG Study).

The California Emissions Estimator Model Version 2020.4.0 (CalEEMod) is used to calculate energy usage from project construction and operational activities.

The CalEEMod Annual Reports for the project are provided in Appendix A.

3.2 Electricity Consumption

The project will use electricity for many different operational activities including, but not limited to, building heating and cooling, lighting, appliances, electronics, mechanical equipment, electric vehicle charging, and parking lot lighting. Indirect electricity usage will also be required to supply, distribute, and treat water and wastewater. Electricity will be provided to the site by Southern California Edison.

Temporary electricity usage for construction activities may include lighting, electric equipment and mobile office uses, however, CalEEMod does not calculate electricity usage during construction. Electricity usage during construction is expected to be short-term and relatively minor compared to the operational demand, and therefore electricity usage during construction is not counted in this analysis.

Table 6 shows the project's estimated operational electricity consumption in kilowatt-hours per year (kWh/year) and millions of Btu per year.

Table 6
Project Electricity Consumption

Land Use/Activity	Electricity Consumption[1]	
	(kWhr/yr)[2]	(MBtu/yr)[2]
Apartments Mid Rise	2,736,370.00	9,336.49
Enclosed Parking with Elevator	1,999,740.00	6,823.11
Parking Lot	163,800.00	558.89
Regional Shopping Center	864,368.00	2,949.22
Water Supply and Treatment	1,066,561.70	3,639.11
Total	6,830,839.70	23,306.83

[1] Source: CalEEMod Defaults. Refer Appendix A

[2] kWhr/yr = Kilowatt Hours per Year
MBtu/yr = Million British Thermal Units per Year

3.3 Natural Gas Consumption

The project will use natural gas for such things as building heating and cooling, cooking, kitchen appliances, and gas water heaters. Natural gas is not expected to be used during construction in any significant quantities and is not included in the overall calculation of the project's natural gas consumption.

Table 7 shows the project's estimated operational natural gas consumption in millions of Btu per year.

Table 7
Project Natural Gas Consumption

Land Use/Activity	Natural Gas Consumption[1] (MBtu/yr)[2]
Apartments Mid Rise	9,938.08
Regional Shopping Center	156.64
Total	10,094.72

[1] Source: CalEEMod Defaults. Refer Appendix A

[2] MBtu/yr = Millions of British Thermal Units per Year

3.4 Petroleum Consumption

The project's energy consumption from petroleum products is primarily associated with transportation related activities. This includes gasoline and diesel fuel usage for auto and truck trips during construction and operation and off-road equipment usage during construction.

3.4.1 Petroleum Consumption - Construction

Construction of the project is estimated to last approximately 21 months and consist of demolition, site preparation, grading, building construction, paving, and architectural coating phases. Construction activities will consume energy in the form of motor vehicle fuel (gasoline and diesel) for off-road construction equipment and on-road vehicle trips. Vehicle trips include workers and vendors traveling to and from the job-site.

Table 8 shows the project's energy consumption for all off-road equipment during construction. For purposes of this analysis, all off-road equipment is assumed to run on diesel fuel. Table 9 shows the project's energy consumption from on-road vehicle trips during construction.

TABLE 8
Construction Off-Road Equipment Energy Consumption

Phase[1]	Phase Duration (Days)[1]	Equipment[1]	Amount[1]	Hours/ Day[1]	Horspower (HP)[1]	Load Factor[1]	HP-hrs[2]	Fuel Consumption Rate[3] (hp-hr/gal)	Diesel Fuel Consumption (gal.)	Diesel Fuel Consumption by Phase (gal.)	MBtu[4]
Demolition	20	Concrete/Industrial Saws	1	8	81	0.73	9,460.8	18.5	511.4	3,778.2	519.048
		Excavators	3	8	158	0.38	28,819.2		1,557.8		
		Rubber Tired Dozers	2	8	247	0.40	31,616.0		1,709.0		
Site Preparation	10	Rubber Tired Dozers	3	8	247	0.40	23,712.0		1,281.7	1,902.5	261.371
		Tractors/Loaders/Backhoes	4	8	97	0.37	11,484.8		620.8		
Grading	30	Excavators	2	8	158	0.38	28,819.2		1,557.8	9,336.0	1,282.589
		Graders	1	8	187	0.41	18,400.8		994.6		
		Rubber Tired Dozers	1	8	247	0.40	23,712.0		1,281.7		
		Scrapers	2	8	367	0.48	84,556.8		4,570.6		
		Tractors/Loaders/Backhoes	2	8	97	0.37	17,227.2		931.2		
Building Construction	300	Cranes	1	7	231	0.29	140,679.0		7,604.3	37,503.2	5,152.233
		Forklifts	3	8	89	0.20	128,160.0		6,927.6		
		Generator Sets	1	8	84	0.74	149,184.0		8,064.0		
		Tractors/Loaders/Backhoes	3	7	97	0.37	226,107.0		12,222.0		
		Welders	1	8	46	0.45	49,680.0		2,685.4		
Paving	20	Pavers	1	6	130	0.42	6,552.0		354.2	1,124.8	154.520
		Paving Equipment	1	8	132	0.36	7,603.2		411.0		
		Rollers	1	7	132	0.36	6,652.8		359.6		
Architectural Coating	75	Air Compressors	1	6	78	0.48	16,848.0		910.7	910.7	125.113
								Total Energy Requirements		**54,555.4**	**7,494.875**

[1] Source: Appendix A Annual Results Sheet. (CalEEMod v.2020.4.0)

[2] HP-hrs = Horsepower Hours.

[3] Source: Carl Moyer Program Guidelines. 2017 Revisions. Table D-21. https://www.arb.ca.gov/msprog/moyer/guidelines/current.htm

[4] Mbtu = Millions of Btu; assuming 1 gallon of diesel fuel = 137,381 Btu.

Table 9
Construction On-Road Trips Energy Consumption

Construction Phase[1]	Phase Duration (Days)[1]	Trips /Day[1]	Trip Length[1]	Phase VMT	Vehicle Class[1]	Vehicle Mix[1]	Average Fuel Economy (MPG)[2]	Gasoline			Diesel			Total MBtu[3]
								Fuel Split[2]	Fuel Consumption by Veh. Class (gal.)	Fuel Consumption by Phase (gal.)	Fuel Split[2]	Fuel Consumption by Veh. Class (gal.)	Fuel Consumption by Phase	
Worker Trips														
Demolition	20	15	14.7	4,410	LDA	0.50	32.59	0.9938	67.24	150.21	0.0062	0.42	0.66	18.18
					LDT1	0.25	27.46	0.9996	40.13		0.0004	0.02		
					LDT2	0.25	25.60	0.9947	42.84		0.0053	0.23		
Site Prerparation	10	18	14.7	2,646	LDA	0.50	32.59	0.9938	40.34	90.13	0.0062	0.25	0.40	10.91
					LDT1	0.25	27.46	0.9996	24.08		0.0004	0.01		
					LDT2	0.25	25.60	0.9947	25.70		0.0053	0.14		
Grading	30	20	14.7	8,820	LDA	0.50	32.59	0.9938	134.48	300.42	0.0062	0.84	1.33	36.36
					LDT1	0.25	27.46	0.9996	80.27		0.0004	0.03		
					LDT2	0.25	25.60	0.9947	85.68		0.0053	0.46		
Building Construction	300	871	14.7	3,841,110	LDA	0.50	32.59	0.9938	58,565.44	130,833.53	0.0062	365.37	578.17	15,835.58
					LDT1	0.25	27.46	0.9996	34,956.06		0.0004	13.99		
					LDT2	0.25	25.60	0.9947	37,312.03		0.0053	198.81		
Paving	20	15	14.7	4,410	LDA	0.50	32.59	0.9938	67.24	150.21	0.0062	0.42	0.66	18.18
					LDT1	0.25	27.46	0.9996	40.13		0.0004	0.02		
					LDT2	0.25	25.60	0.9947	42.84		0.0053	0.23		
Architectural Coating	75	174	14.7	191,835	LDA	0.50	32.59	0.9938	2,924.91	6,534.17	0.0062	18.25	28.88	790.87
					LDT1	0.25	27.46	0.9996	1,745.80		0.0004	0.70		
					LDT2	0.25	25.60	0.9947	1,863.46		0.0053	9.93		
Sub-Total Worker Trips Energy Consumption									Gasoline (gal.)	138,058.66		Diesel (gal.)	610.10	16,710.08
Vendor Trips														
Building Construction	300	222	6.9	459,540	MHDT	0.50	9.58	0.2679	6,425.41	6,458.51	0.7321	17,558.94	50,633.90	7,733.93
					HHDT	0.50	6.94	0.0010	33.11		0.9990	33,074.96		
Hauling Trips														
Demolition	20	1,483	20.0	593,200	HHDT	1.00	6.94	0.0010	85.48	85.48	0.9990	85,390.03	85,390.03	11,741.26
Total On-Road Construction Trips Energy Consumption									**Gasoline (gal.)**	**144,602.65**		**Diesel (gal.)**	**136,634.02**	**36,185.27**

1 Source: Appendix A Annual Results Sheet. (CalEEMod v.2020.4.0)
[2] Source: EMFAC2017 Web Database. https://www.arb.ca.gov/emfac/2017/. (See Appendix B for more details.)
[3] Mbtu = Millions of Btu; assuming 1 gallon of gasoline fuel = 120,429 Btu and 1 gallon of diesel fuel = 137,381 Btu

3.4.2 Petroleum Consumption - Operation

The project is expected to consume energy from auto and truck trips generated by the proposed land uses, as described in the Toyota Arena Mixed Use Development Traffic Impact Study Scoping Agreement, by RK, May 2021 and the Toyota Arena Mixed Use Development Air Quality and Greenhouse Gas Impact Study, prepared by RK Engineering Group, Inc., dated June 2021. Operational vehicle trips are associated with workers, customers and vendors/non-workers (i.e., delivery, service, maintenance vehicles, etc.) traveling to and from the site.

Table 10 shows the project's petroleum energy consumption for all operational trips generated by the project on an annual basis.

Table 10
Operational Trips Energy Consumption - Annual

Vehicle Class	Vehicle Mix	Average Fuel Economy (MPG)	Mitigated Annual VMT	Gasoline		Diesel		MBtu
				Fuel Split	Fuel Consumption (gal.)	Fuel Split	Fuel Consumption (gal.)	
LDA	55.05%	32.59		0.9938	171,606.07	0.0062	1,070.60	20,813.43
LDT1	5.72%	27.46		0.9996	21,269.87	0.0004	8.51	2,562.68
LDT2	17.64%	25.60		0.9947	70,077.78	0.0053	373.39	8,490.69
MDV	14.23%	20.81		0.9815	68,604.36	0.0185	1,293.10	8,439.60
LHD1	2.76%	13.81		0.7188	14,708.48	0.2812	5,754.07	2,561.83
LHD2	0.34%	14.18		0.5328	1,294.18	0.4672	1,134.84	311.76
MHD	0.53%	9.58	10,221,754	0.2679	1,524.84	0.7321	4,166.97	756.10
HHD	0.81%	6.94		0.0010	11.92	0.9990	11,909.43	1,637.56
OBUS	0.03%	5.11		1.0000	523.61	0.0000	0.00	63.06
UBUS	0.01%	5.18		0.9866	231.56	0.0134	3.15	28.32
MCY	2.59%	36.38		1.0000	7,278.11	0.0000	0.00	876.50
SBUS	0.04%	8.15		0.3076	172.34	0.6924	387.94	74.05
MH	0.24%	6.07		0.8447	3,377.72	0.1553	621.00	492.09
Total Operational Trips Energy Usage				Gasoline Consumption (gal.)	360,680.84	Diesel Consumption (gal.)	26,723.00	47,107.67

[1] Source: Toyota Arena Mixed Use Development Air Quality and Greenhouse Gas Analysis, by RK Engineering Group, Inc. (CalEEMod .2020.4.0)
[2] Source: EMFAC2017 Web Database. https://www.arb.ca.gov/emfac/2017/. (See Appendix B for more details.)
[3] MBtu/yr = Millions of Btu per year; assuming 1 gallon of gasoline fuel = 120,429 Btu and 1 gallon of diesel fuel = 137,381 Btu

3.5 Summary of Project Energy Consumption

Table 11 provides a summary of the project's annual operational energy consumption.

Table 11
Annual Energy Consumption

Activity	Energy Consumption (MBtu/yr)[1]
Total Annual Operational Energy Consumption	**80,509.21**
Electricity	23,306.83
Natural Gas	10,094.72
Petroleum	47,107.67

[1] MBtu/yr = Millions of Btu per year. Operational activities only.

4.0 Energy Impacts

4.1 Energy Impact Criteria

This analysis has been prepared within the context of the CEQA Guidelines, Appendix F, Energy Conservation, and Appendix G, Environmental Checklist Form. According to CEQA, the goal of conserving energy implies the wise and efficient use of energy through decreasing overall per capita energy consumption, decreasing reliance on fossil fuels (such as coal, natural gas and oil), and increasing reliance on renewable energy sources.

A significant environmental impact would result if the project would;

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation, or;

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

4.2 Energy Impact – 1

Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

The project's impact is considered less than significant with the inclusion of the mandatory requirements of California's Building Energy Efficiency Standards (Title 24, Part 6) and Green Building Standards (CALGreen, Title 24, Part 11). California's building energy efficiency standards are some of the strictest in the nation and the project's compliance with California's building code will ensure that wasteful, inefficient or unnecessary consumption of energy is minimized. The building standards code is designed to reduce the amount of energy needed to heat or cool a building, reduce energy usage for lighting and appliances.

The following recommended design features are provided to reduce wasteful, inefficient and unnecessary consumption of energy. Design features are consistent with the recommended design features provided with Air/GHG study.

Construction Design Features

DF-1 Establish an electricity supply to the construction site and use electric powered equipment instead of diesel-powered equipment or generators, where feasible.

Operational Design Features

DF-2 Implement the GHG Reduction Measures from the Ontario County Climate Action Plan (CAP) Screening Tables to achieve at least 100 points, per the requirements for Mixed Use Projects.

DF-3 Comply with the mandatory requirements of California Building Standards Code Title 24 Part 6 (Energy Code) and Title 24 Part 11 (CAL Green).

DF-4 Implement water conservation strategies, including low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and limit the amount of turf/sod, per CAL Green and City of Ontario requirements.

DF-5 Implement zero waste strategies, recycling and composting programs for residential and non-residential uses.

DF-6 Encourage residents and landscape maintenance crews to use electric landscaping equipment, such as lawn mowers and leaf blowers, wherever feasible.

DF-7 No natural gas or wood burning fireplaces shall be installed in any residential dwelling.

DF-8 Implement trip reduction measures that reduce the number of auto-based trips and encourage the use of transit, bicycling, and walking. Such as;

1. Improve the walkability and design of the project by including pedestrian and bicycling connections within the project site and to adjacent off-site facilities (i.e. sidewalks, crosswalks, foot paths, protected bike lanes, multi-purpose trails, direct parcel-to-parcel connections, wayfinding signage, etc.).

2. Provide traffic calming measures (i.e. marked crosswalks, raised crosswalks, raised intersections, count-down signal timers, curb extensions, speed tables, median islands, tight corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, etc.)

3. Provide bicycle racks for the retail and commercial uses and secure bicycle parking areas for the office and residential uses.

DF-9 Provide electric vehicle charging stations per the requirements of CALGreen.

4.3 Energy Impact – 2

Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

The project's impact is considered less than significant as the project will purchase electricity through Southern California Edison which is subject to the requirements of California Senate Bill 100 (SB 100). SB 100 is the most stringent and current energy legislation in California; requiring that renewable energy resources and zero-carbon resources supply 100% of retail sales of electricity to California end-use customers and 100% of electricity procured to serve all state agencies by December 31, 2045.[1]

The project will further comply with the mandatory requirements of California's Green Building and Building Energy Efficiency standards that promote renewable energy and energy efficiency.

[1] SB-100 California Renewables Portfolio Standard Program. http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB100

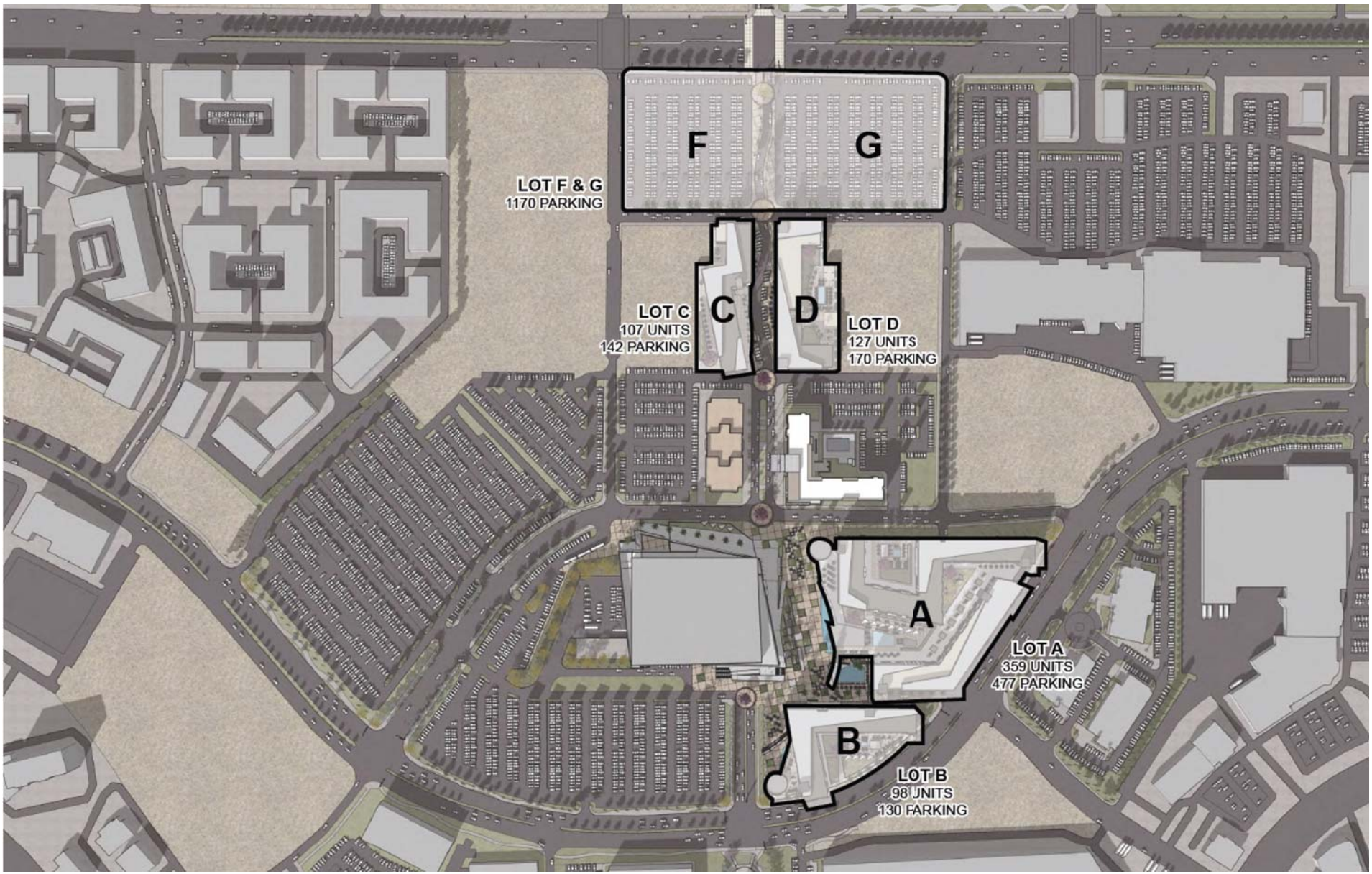
Exhibits

Exhibit A

Location Map

N

Site Plan


F
G
LOT F & G
1170 PARKING
C
D
LOT C
107 UNITS
142 PARKING
LOT D
127 UNITS
170 PARKING
A
LOT A
359 UNITS
477 PARKING
B
LOT B
98 UNITS
130 PARKING

Appendices

Appendix A

CalEEMod Annual Emissions Output

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Toyota Arena Mixed Use Development

San Bernardino-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Mid Rise	691.00	Dwelling Unit	11.47	691,000.00	1976
Enclosed Parking with Elevator	919.00	Space	0.00	367,600.00	0
Parking Lot	1,170.00	Space	7.26	468,000.00	0
Regional Shopping Center	71.20	1000sqft	0.00	71,200.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	32
Climate Zone	10			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	531.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The proposed project consists of a mixed-use town center development with 691 multifamily DU and 71,200 square feet of commercial/retail land uses on approximately 18.73 acres.

Construction Phase - The project's architectural coating phase will be extended to 75 days.

Demolition - The project is proposing to demolish approximetely 326,026 square feet of surface asphalt parking lot.

Vehicle Trips - The trip generation rates have been updated to reflect Toyota Arena TIA Scoping Agreement, by RK, May 25, 2021 and Traffic Impact Study and SANBAG VMT Model.

Fleet Mix - Operational fleet mix adjusted to equal 2% trucks with GVWR > 10,000 lbs.

Woodstoves - SCAQMD Rule 445 restricts wood burning hearths/fireplaces from being installed in new development.

Construction Off-road Equipment Mitigation - Project will be required to comply with SCAQMD Rule 403 regarding fugitive dust control.

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	20.00	75.00
tblConstructionPhase	PhaseEndDate	4/13/2023	6/29/2023
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberWood	34.55	0.00
tblFleetMix	HHD	0.00	8.0940e-003
tblFleetMix	HHD	0.00	0.02
tblFleetMix	HHD	0.00	0.02
tblFleetMix	HHD	0.00	8.0940e-003
tblFleetMix	LDA	0.00	0.55
tblFleetMix	LDA	0.00	0.54
tblFleetMix	LDA	0.00	0.54
tblFleetMix	LDA	0.00	0.55
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT1	0.00	0.06
tblFleetMix	LDT2	0.00	0.18
tblFleetMix	LDT2	0.00	0.17
tblFleetMix	LDT2	0.00	0.17
tblFleetMix	LDT2	0.00	0.18
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD2	0.00	3.3700e-003
tblFleetMix	LHD2	0.00	7.1960e-003

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblFleetMix	LHD2	0.00	7.1960e-003
tblFleetMix	LHD2	0.00	3.3700e-003
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MCY	0.00	0.03
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MDV	0.00	0.14
tblFleetMix	MH	0.00	2.3750e-003
tblFleetMix	MH	0.00	5.0710e-003
tblFleetMix	MH	0.00	5.0710e-003
tblFleetMix	MH	0.00	2.3750e-003
tblFleetMix	MHD	0.00	5.3340e-003
tblFleetMix	MHD	0.00	0.01
tblFleetMix	MHD	0.00	0.01
tblFleetMix	MHD	0.00	5.3340e-003
tblFleetMix	OBUS	0.00	2.6200e-004
tblFleetMix	OBUS	0.00	5.5900e-004
tblFleetMix	OBUS	0.00	5.5900e-004
tblFleetMix	OBUS	0.00	2.6200e-004
tblFleetMix	SBUS	0.00	4.4700e-004
tblFleetMix	SBUS	0.00	9.5400e-004
tblFleetMix	SBUS	0.00	9.5400e-004
tblFleetMix	SBUS	0.00	4.4700e-004
tblFleetMix	UBUS	0.00	1.1900e-004
tblFleetMix	UBUS	0.00	2.5400e-004
tblFleetMix	UBUS	0.00	2.5400e-004

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblFleetMix	UBUS	0.00	1.1900e-004
tblLandUse	LotAcreage	18.18	11.47
tblLandUse	LotAcreage	8.27	0.00
tblLandUse	LotAcreage	10.53	7.26
tblLandUse	LotAcreage	1.63	0.00
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	HO_TL	8.70	4.37
tblVehicleTrips	HO_TTP	40.60	0.00
tblVehicleTrips	HS_TL	5.90	4.37
tblVehicleTrips	HS_TTP	19.20	0.00
tblVehicleTrips	HW_TL	14.70	4.37
tblVehicleTrips	HW_TTP	40.20	100.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	ST_TR	4.91	5.17
tblVehicleTrips	ST_TR	46.12	36.38
tblVehicleTrips	SU_TR	4.09	5.17
tblVehicleTrips	WD_TR	5.44	5.17
tblVehicleTrips	WD_TR	37.75	29.77
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.1379	1.4343	0.9987	2.4700e-003	0.4484	0.0609	0.5093	0.1435	0.0564	0.1999	0.0000	224.5415	224.5415	0.0463	9.7200e-003	228.5934
2022	0.6978	3.6944	6.6165	0.0197	1.4235	0.1269	1.5504	0.3823	0.1195	0.5017	0.0000	1,821.1850	1,821.1850	0.1147	0.1062	1,855.7077
2023	2.7410	0.5904	1.2453	3.4500e-003	0.2593	0.0218	0.2812	0.0694	0.0206	0.0900	0.0000	318.7457	318.7457	0.0230	0.0147	323.7039
Maximum	**2.7410**	**3.6944**	**6.6165**	**0.0197**	**1.4235**	**0.1269**	**1.5504**	**0.3823**	**0.1195**	**0.5017**	**0.0000**	**1,821.1850**	**1,821.1850**	**0.1147**	**0.1062**	**1,855.7077**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0376	0.2555	1.0489	2.4700e-003	0.2033	5.1200e-003	0.2085	0.0635	5.0000e-003	0.0685	0.0000	224.5413	224.5413	0.0463	9.7200e-003	228.5933
2022	0.5186	1.9549	6.7591	0.0197	1.4235	0.0270	1.4506	0.3823	0.0258	0.4081	0.0000	1,821.1847	1,821.1847	0.1147	0.1062	1,855.7073
2023	2.7062	0.2501	1.2939	3.4500e-003	0.2593	3.4000e-003	0.2627	0.0694	3.2600e-003	0.0727	0.0000	318.7457	318.7457	0.0230	0.0147	323.7038
Maximum	**2.7062**	**1.9549**	**6.7591**	**0.0197**	**1.4235**	**0.0270**	**1.4506**	**0.3823**	**0.0258**	**0.4081**	**0.0000**	**1,821.1847**	**1,821.1847**	**0.1147**	**0.1062**	**1,855.7073**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**8.79**	**56.98**	**-2.72**	**0.00**	**11.50**	**83.06**	**17.91**	**13.45**	**82.65**	**30.62**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**10-1-2021**	**12-31-2021**	1.5660	0.2892
2	**1-1-2022**	**3-31-2022**	1.0897	0.6152
3	**4-1-2022**	**6-30-2022**	1.0873	0.6076
4	**7-1-2022**	**9-30-2022**	1.0992	0.6143
5	**10-1-2022**	**12-31-2022**	1.1139	0.6289
6	**1-1-2023**	**3-31-2023**	1.0104	0.6811
7	**4-1-2023**	**6-30-2023**	2.3186	2.2757
		Highest	2.3186	2.2757

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.3006	0.2042	7.2070	1.1600e-003		0.0494	0.0494		0.0494	0.0494	0.0000	152.7384	152.7384	0.0140	2.5900e-003	153.8599
Energy	0.0544	0.4656	0.2013	2.9700e-003		0.0376	0.0376		0.0376	0.0376	0.0000	1,929.6251	1,929.6251	0.0966	0.0203	1,938.1000
Mobile	2.4002	2.4859	20.0954	0.0365	3.8326	0.0279	3.8605	1.0209	0.0260	1.0469	0.0000	3,401.2398	3,401.2398	0.2559	0.1743	3,459.5668
Waste						0.0000	0.0000		0.0000	0.0000	79.6983	0.0000	79.6983	4.7100	0.0000	197.4492
Water						0.0000	0.0000		0.0000	0.0000	15.9564	242.7848	258.7412	1.6539	0.0405	312.1654
Total	**5.7552**	**3.1557**	**27.5037**	**0.0406**	**3.8326**	**0.1149**	**3.9475**	**1.0209**	**0.1130**	**1.1339**	**95.6547**	**5,726.3881**	**5,822.0429**	**6.7306**	**0.2377**	**6,061.1414**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.3006	0.2042	7.2070	1.1600e-003		0.0494	0.0494		0.0494	0.0494	0.0000	152.7384	152.7384	0.0140	2.5900e-003	153.8599
Energy	0.0544	0.4656	0.2013	2.9700e-003		0.0376	0.0376		0.0376	0.0376	0.0000	1,929.6251	1,929.6251	0.0966	0.0203	1,938.1000
Mobile	2.4002	2.4859	20.0954	0.0365	3.8326	0.0279	3.8605	1.0209	0.0260	1.0469	0.0000	3,401.2398	3,401.2398	0.2559	0.1743	3,459.5668
Waste						0.0000	0.0000		0.0000	0.0000	79.6983	0.0000	79.6983	4.7100	0.0000	197.4492
Water						0.0000	0.0000		0.0000	0.0000	15.9564	242.7848	258.7412	1.6539	0.0405	312.1654
Total	**5.7552**	**3.1557**	**27.5037**	**0.0406**	**3.8326**	**0.1149**	**3.9475**	**1.0209**	**0.1130**	**1.1339**	**95.6547**	**5,726.3881**	**5,822.0429**	**6.7306**	**0.2377**	**6,061.1414**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	10/1/2021	10/28/2021	5	20	
2	Site Preparation	Site Preparation	10/29/2021	11/11/2021	5	10	
3	Grading	Grading	11/12/2021	12/23/2021	5	30	

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4	Building Construction	Building Construction	12/24/2021	2/16/2023	5	300	
5	Paving	Paving	2/17/2023	3/16/2023	5	20	
6	Architectural Coating	Architectural Coating	3/17/2023	6/29/2023	5	75	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 90

Acres of Paving: 7.26

Residential Indoor: 1,399,275; Residential Outdoor: 466,425; Non-Residential Indoor: 106,800; Non-Residential Outdoor: 35,600; Striped Parking Area: 50,136 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	7.00	231	0.29
Demolition	Excavators	3	8.00	158	0.38
Grading	Excavators	2	8.00	158	0.38
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	1,483.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	871.00	222.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	174.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1605	0.0000	0.1605	0.0243	0.0000	0.0243	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0317	0.3144	0.2157	3.9000e-004		0.0155	0.0155		0.0144	0.0144	0.0000	34.0008	34.0008	9.5700e-003	0.0000	34.2400
Total	**0.0317**	**0.3144**	**0.2157**	**3.9000e-004**	**0.1605**	**0.0155**	**0.1760**	**0.0243**	**0.0144**	**0.0387**	**0.0000**	**34.0008**	**34.0008**	**9.5700e-003**	**0.0000**	**34.2400**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.7800e-003	0.1221	0.0296	4.5000e-004	0.0128	1.7400e-003	0.0145	3.5100e-003	1.6600e-003	5.1700e-003	0.0000	44.2265	44.2265	1.9200e-003	7.0100e-003	46.3629
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.1000e-004	5.1000e-004	5.8300e-003	1.0000e-005	1.6400e-003	1.0000e-005	1.6500e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.3559	1.3559	4.0000e-005	4.0000e-005	1.3693
Total	**4.3900e-003**	**0.1226**	**0.0354**	**4.6000e-004**	**0.0144**	**1.7500e-003**	**0.0162**	**3.9500e-003**	**1.6700e-003**	**5.6200e-003**	**0.0000**	**45.5824**	**45.5824**	**1.9600e-003**	**7.0500e-003**	**47.7322**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Demolition - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0614	0.0000	0.0614	9.2900e-003	0.0000	9.2900e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.6200e-003	0.0200	0.2328	3.9000e-004		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	34.0007	34.0007	9.5700e-003	0.0000	34.2400
Total	**4.6200e-003**	**0.0200**	**0.2328**	**3.9000e-004**	**0.0614**	**6.2000e-004**	**0.0620**	**9.2900e-003**	**6.2000e-004**	**9.9100e-003**	**0.0000**	**34.0007**	**34.0007**	**9.5700e-003**	**0.0000**	**34.2400**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.7800e-003	0.1221	0.0296	4.5000e-004	0.0128	1.7400e-003	0.0145	3.5100e-003	1.6600e-003	5.1700e-003	0.0000	44.2265	44.2265	1.9200e-003	7.0100e-003	46.3629
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.1000e-004	5.1000e-004	5.8300e-003	1.0000e-005	1.6400e-003	1.0000e-005	1.6500e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.3559	1.3559	4.0000e-005	4.0000e-005	1.3693
Total	**4.3900e-003**	**0.1226**	**0.0354**	**4.6000e-004**	**0.0144**	**1.7500e-003**	**0.0162**	**3.9500e-003**	**1.6700e-003**	**5.6200e-003**	**0.0000**	**45.5824**	**45.5824**	**1.9600e-003**	**7.0500e-003**	**47.7322**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0983	0.0000	0.0983	0.0505	0.0000	0.0505	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0194	0.2025	0.1058	1.9000e-004		0.0102	0.0102		9.4000e-003	9.4000e-003	0.0000	16.7179	16.7179	5.4100e-003	0.0000	16.8530
Total	**0.0194**	**0.2025**	**0.1058**	**1.9000e-004**	**0.0983**	**0.0102**	**0.1085**	**0.0505**	**9.4000e-003**	**0.0599**	**0.0000**	**16.7179**	**16.7179**	**5.4100e-003**	**0.0000**	**16.8530**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7000e-004	3.0000e-004	3.5000e-003	1.0000e-005	9.9000e-004	1.0000e-005	9.9000e-004	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.8136	0.8136	3.0000e-005	2.0000e-005	0.8216
Total	**3.7000e-004**	**3.0000e-004**	**3.5000e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**9.9000e-004**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.8136**	**0.8136**	**3.0000e-005**	**2.0000e-005**	**0.8216**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Site Preparation - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0376	0.0000	0.0376	0.0193	0.0000	0.0193	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3300e-003	0.0101	0.1043	1.9000e-004		3.1000e-004	3.1000e-004		3.1000e-004	3.1000e-004	0.0000	16.7178	16.7178	5.4100e-003	0.0000	16.8530
Total	**2.3300e-003**	**0.0101**	**0.1043**	**1.9000e-004**	**0.0376**	**3.1000e-004**	**0.0379**	**0.0193**	**3.1000e-004**	**0.0196**	**0.0000**	**16.7178**	**16.7178**	**5.4100e-003**	**0.0000**	**16.8530**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7000e-004	3.0000e-004	3.5000e-003	1.0000e-005	9.9000e-004	1.0000e-005	9.9000e-004	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.8136	0.8136	3.0000e-005	2.0000e-005	0.8216
Total	**3.7000e-004**	**3.0000e-004**	**3.5000e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**9.9000e-004**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.8136**	**0.8136**	**3.0000e-005**	**2.0000e-005**	**0.8216**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1381	0.0000	0.1381	0.0548	0.0000	0.0548	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0629	0.6960	0.4632	9.3000e-004		0.0298	0.0298		0.0274	0.0274	0.0000	81.7425	81.7425	0.0264	0.0000	82.4034
Total	**0.0629**	**0.6960**	**0.4632**	**9.3000e-004**	**0.1381**	**0.0298**	**0.1678**	**0.0548**	**0.0274**	**0.0822**	**0.0000**	**81.7425**	**81.7425**	**0.0264**	**0.0000**	**82.4034**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2300e-003	1.0100e-003	0.0117	3.0000e-005	3.2900e-003	2.0000e-005	3.3100e-003	8.7000e-004	2.0000e-005	8.9000e-004	0.0000	2.7118	2.7118	8.0000e-005	8.0000e-005	2.7386
Total	**1.2300e-003**	**1.0100e-003**	**0.0117**	**3.0000e-005**	**3.2900e-003**	**2.0000e-005**	**3.3100e-003**	**8.7000e-004**	**2.0000e-005**	**8.9000e-004**	**0.0000**	**2.7118**	**2.7118**	**8.0000e-005**	**8.0000e-005**	**2.7386**

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3.4 Grading - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0528	0.0000	0.0528	0.0210	0.0000	0.0210	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0114	0.0495	0.4950	9.3000e-004		1.5200e-003	1.5200e-003		1.5200e-003	1.5200e-003	0.0000	81.7424	81.7424	0.0264	0.0000	82.4033
Total	**0.0114**	**0.0495**	**0.4950**	**9.3000e-004**	**0.0528**	**1.5200e-003**	**0.0543**	**0.0210**	**1.5200e-003**	**0.0225**	**0.0000**	**81.7424**	**81.7424**	**0.0264**	**0.0000**	**82.4033**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2300e-003	1.0100e-003	0.0117	3.0000e-005	3.2900e-003	2.0000e-005	3.3100e-003	8.7000e-004	2.0000e-005	8.9000e-004	0.0000	2.7118	2.7118	8.0000e-005	8.0000e-005	2.7386
Total	**1.2300e-003**	**1.0100e-003**	**0.0117**	**3.0000e-005**	**3.2900e-003**	**2.0000e-005**	**3.3100e-003**	**8.7000e-004**	**2.0000e-005**	**8.9000e-004**	**0.0000**	**2.7118**	**2.7118**	**8.0000e-005**	**8.0000e-005**	**2.7386**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.7000e-003	0.0523	0.0497	8.0000e-005		2.8800e-003	2.8800e-003		2.7000e-003	2.7000e-003	0.0000	6.9491	6.9491	1.6800e-003	0.0000	6.9910
Total	**5.7000e-003**	**0.0523**	**0.0497**	**8.0000e-005**		**2.8800e-003**	**2.8800e-003**		**2.7000e-003**	**2.7000e-003**	**0.0000**	**6.9491**	**6.9491**	**1.6800e-003**	**0.0000**	**6.9910**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.5700e-003	0.0364	0.0122	1.3000e-004	4.2000e-003	6.1000e-004	4.8100e-003	1.2100e-003	5.9000e-004	1.8000e-003	0.0000	12.4033	12.4033	3.5000e-004	1.8400e-003	12.9601
Worker	0.0107	8.8300e-003	0.1016	2.6000e-004	0.0287	1.6000e-004	0.0288	7.6100e-003	1.5000e-004	7.7600e-003	0.0000	23.6201	23.6201	7.3000e-004	7.2000e-004	23.8534
Total	**0.0123**	**0.0453**	**0.1138**	**3.9000e-004**	**0.0329**	**7.7000e-004**	**0.0336**	**8.8200e-003**	**7.4000e-004**	**9.5600e-003**	**0.0000**	**36.0234**	**36.0234**	**1.0800e-003**	**2.5600e-003**	**36.8135**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.8000e-004	6.7000e-003	0.0524	8.0000e-005		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004	0.0000	6.9491	6.9491	1.6800e-003	0.0000	6.9910
Total	**9.8000e-004**	**6.7000e-003**	**0.0524**	**8.0000e-005**		**1.2000e-004**	**1.2000e-004**		**1.2000e-004**	**1.2000e-004**	**0.0000**	**6.9491**	**6.9491**	**1.6800e-003**	**0.0000**	**6.9910**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.5700e-003	0.0364	0.0122	1.3000e-004	4.2000e-003	6.1000e-004	4.8100e-003	1.2100e-003	5.9000e-004	1.8000e-003	0.0000	12.4033	12.4033	3.5000e-004	1.8400e-003	12.9601
Worker	0.0107	8.8300e-003	0.1016	2.6000e-004	0.0287	1.6000e-004	0.0288	7.6100e-003	1.5000e-004	7.7600e-003	0.0000	23.6201	23.6201	7.3000e-004	7.2000e-004	23.8534
Total	**0.0123**	**0.0453**	**0.1138**	**3.9000e-004**	**0.0329**	**7.7000e-004**	**0.0336**	**8.8200e-003**	**7.4000e-004**	**9.5600e-003**	**0.0000**	**36.0234**	**36.0234**	**1.0800e-003**	**2.5600e-003**	**36.8135**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2218	2.0300	2.1272	3.5000e-003		0.1052	0.1052		0.0990	0.0990	0.0000	301.2428	301.2428	0.0722	0.0000	303.0471
Total	**0.2218**	**2.0300**	**2.1272**	**3.5000e-003**		**0.1052**	**0.1052**		**0.0990**	**0.0990**	**0.0000**	**301.2428**	**301.2428**	**0.0722**	**0.0000**	**303.0471**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0492	1.3293	0.4713	5.3900e-003	0.1820	0.0151	0.1971	0.0525	0.0144	0.0669	0.0000	524.0510	524.0510	0.0141	0.0776	547.5317
Worker	0.4268	0.3350	4.0179	0.0108	1.2415	6.6400e-003	1.2482	0.3297	6.1200e-003	0.3359	0.0000	995.8912	995.8912	0.0284	0.0286	1,005.1289
Total	**0.4760**	**1.6644**	**4.4892**	**0.0162**	**1.4236**	**0.0217**	**1.4452**	**0.3823**	**0.0205**	**0.4028**	**0.0000**	**1,519.9422**	**1,519.9422**	**0.0425**	**0.1062**	**1,552.6606**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0426	0.2905	2.2698	3.5000e-003		5.3000e-003	5.3000e-003		5.3000e-003	5.3000e-003	0.0000	301.2425	301.2425	0.0722	0.0000	303.0467
Total	**0.0426**	**0.2905**	**2.2698**	**3.5000e-003**		**5.3000e-003**	**5.3000e-003**		**5.3000e-003**	**5.3000e-003**	**0.0000**	**301.2425**	**301.2425**	**0.0722**	**0.0000**	**303.0467**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0492	1.3293	0.4713	5.3900e-003	0.1820	0.0151	0.1971	0.0525	0.0144	0.0669	0.0000	524.0510	524.0510	0.0141	0.0776	547.5317
Worker	0.4268	0.3350	4.0179	0.0108	1.2415	6.6400e-003	1.2482	0.3297	6.1200e-003	0.3359	0.0000	995.8912	995.8912	0.0284	0.0286	1,005.1289
Total	**0.4760**	**1.6644**	**4.4892**	**0.0162**	**1.4236**	**0.0217**	**1.4452**	**0.3823**	**0.0205**	**0.4028**	**0.0000**	**1,519.9422**	**1,519.9422**	**0.0425**	**0.1062**	**1,552.6606**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0267	0.2445	0.2762	4.6000e-004		0.0119	0.0119		0.0112	0.0112	0.0000	39.4068	39.4068	9.3700e-003	0.0000	39.6412
Total	**0.0267**	**0.2445**	**0.2762**	**4.6000e-004**		**0.0119**	**0.0119**		**0.0112**	**0.0112**	**0.0000**	**39.4068**	**39.4068**	**9.3700e-003**	**0.0000**	**39.6412**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.2600e-003	0.1392	0.0564	6.8000e-004	0.0238	1.0000e-003	0.0248	6.8700e-003	9.5000e-004	7.8200e-003	0.0000	65.7744	65.7744	1.7100e-003	9.7200e-003	68.7139
Worker	0.0516	0.0385	0.4818	1.3700e-003	0.1624	8.2000e-004	0.1632	0.0431	7.5000e-004	0.0439	0.0000	126.8010	126.8010	3.3300e-003	3.4400e-003	127.9095
Total	**0.0559**	**0.1778**	**0.5382**	**2.0500e-003**	**0.1862**	**1.8200e-003**	**0.1880**	**0.0500**	**1.7000e-003**	**0.0517**	**0.0000**	**192.5754**	**192.5754**	**5.0400e-003**	**0.0132**	**196.6233**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.5700e-003	0.0380	0.2968	4.6000e-004		6.9000e-004	6.9000e-004		6.9000e-004	6.9000e-004	0.0000	39.4068	39.4068	9.3700e-003	0.0000	39.6411
Total	**5.5700e-003**	**0.0380**	**0.2968**	**4.6000e-004**		**6.9000e-004**	**6.9000e-004**		**6.9000e-004**	**6.9000e-004**	**0.0000**	**39.4068**	**39.4068**	**9.3700e-003**	**0.0000**	**39.6411**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.2600e-003	0.1392	0.0564	6.8000e-004	0.0238	1.0000e-003	0.0248	6.8700e-003	9.5000e-004	7.8200e-003	0.0000	65.7744	65.7744	1.7100e-003	9.7200e-003	68.7139
Worker	0.0516	0.0385	0.4818	1.3700e-003	0.1624	8.2000e-004	0.1632	0.0431	7.5000e-004	0.0439	0.0000	126.8010	126.8010	3.3300e-003	3.4400e-003	127.9095
Total	**0.0559**	**0.1778**	**0.5382**	**2.0500e-003**	**0.1862**	**1.8200e-003**	**0.1880**	**0.0500**	**1.7000e-003**	**0.0517**	**0.0000**	**192.5754**	**192.5754**	**5.0400e-003**	**0.0132**	**196.6233**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0103	0.1019	0.1458	2.3000e-004		5.1000e-003	5.1000e-003		4.6900e-003	4.6900e-003	0.0000	20.0269	20.0269	6.4800e-003	0.0000	20.1888
Paving	9.5100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0198**	**0.1019**	**0.1458**	**2.3000e-004**		**5.1000e-003**	**5.1000e-003**		**4.6900e-003**	**4.6900e-003**	**0.0000**	**20.0269**	**20.0269**	**6.4800e-003**	**0.0000**	**20.1888**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.9000e-004	4.8800e-003	1.0000e-005	1.6400e-003	1.0000e-005	1.6500e-003	4.4000e-004	1.0000e-005	4.4000e-004	0.0000	1.2845	1.2845	3.0000e-005	3.0000e-005	1.2958
Total	**5.2000e-004**	**3.9000e-004**	**4.8800e-003**	**1.0000e-005**	**1.6400e-003**	**1.0000e-005**	**1.6500e-003**	**4.4000e-004**	**1.0000e-005**	**4.4000e-004**	**0.0000**	**1.2845**	**1.2845**	**3.0000e-005**	**3.0000e-005**	**1.2958**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Paving - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.8000e-003	0.0122	0.1730	2.3000e-004		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	20.0268	20.0268	6.4800e-003	0.0000	20.1888
Paving	9.5100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0123**	**0.0122**	**0.1730**	**2.3000e-004**		**3.7000e-004**	**3.7000e-004**		**3.7000e-004**	**3.7000e-004**	**0.0000**	**20.0268**	**20.0268**	**6.4800e-003**	**0.0000**	**20.1888**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.9000e-004	4.8800e-003	1.0000e-005	1.6400e-003	1.0000e-005	1.6500e-003	4.4000e-004	1.0000e-005	4.4000e-004	0.0000	1.2845	1.2845	3.0000e-005	3.0000e-005	1.2958
Total	**5.2000e-004**	**3.9000e-004**	**4.8800e-003**	**1.0000e-005**	**1.6400e-003**	**1.0000e-005**	**1.6500e-003**	**4.4000e-004**	**1.0000e-005**	**4.4000e-004**	**0.0000**	**1.2845**	**1.2845**	**3.0000e-005**	**3.0000e-005**	**1.2958**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.6081					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.1900e-003	0.0489	0.0679	1.1000e-004		2.6600e-003	2.6600e-003		2.6600e-003	2.6600e-003	0.0000	9.5747	9.5747	5.7000e-004	0.0000	9.5890
Total	**2.6153**	**0.0489**	**0.0679**	**1.1000e-004**		**2.6600e-003**	**2.6600e-003**		**2.6600e-003**	**2.6600e-003**	**0.0000**	**9.5747**	**9.5747**	**5.7000e-004**	**0.0000**	**9.5890**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0227	0.0170	0.2123	6.0000e-004	0.0715	3.6000e-004	0.0719	0.0190	3.3000e-004	0.0193	0.0000	55.8774	55.8774	1.4700e-003	1.5200e-003	56.3659
Total	**0.0227**	**0.0170**	**0.2123**	**6.0000e-004**	**0.0715**	**3.6000e-004**	**0.0719**	**0.0190**	**3.3000e-004**	**0.0193**	**0.0000**	**55.8774**	**55.8774**	**1.4700e-003**	**1.5200e-003**	**56.3659**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.7 Architectural Coating - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.6081					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1100e-003	4.8300e-003	0.0687	1.1000e-004		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	9.5747	9.5747	5.7000e-004	0.0000	9.5890
Total	**2.6092**	**4.8300e-003**	**0.0687**	**1.1000e-004**		**1.5000e-004**	**1.5000e-004**		**1.5000e-004**	**1.5000e-004**	**0.0000**	**9.5747**	**9.5747**	**5.7000e-004**	**0.0000**	**9.5890**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0227	0.0170	0.2123	6.0000e-004	0.0715	3.6000e-004	0.0719	0.0190	3.3000e-004	0.0193	0.0000	55.8774	55.8774	1.4700e-003	1.5200e-003	56.3659
Total	**0.0227**	**0.0170**	**0.2123**	**6.0000e-004**	**0.0715**	**3.6000e-004**	**0.0719**	**0.0190**	**3.3000e-004**	**0.0193**	**0.0000**	**55.8774**	**55.8774**	**1.4700e-003**	**1.5200e-003**	**56.3659**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.4002	2.4859	20.0954	0.0365	3.8326	0.0279	3.8605	1.0209	0.0260	1.0469	0.0000	3,401.2398	3,401.2398	0.2559	0.1743	3,459.5668
Unmitigated	2.4002	2.4859	20.0954	0.0365	3.8326	0.0279	3.8605	1.0209	0.0260	1.0469	0.0000	3,401.2398	3,401.2398	0.2559	0.1743	3,459.5668

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	3,572.47	3,572.47	3572.47	5,682,657	5,682,657
Enclosed Parking with Elevator	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Regional Shopping Center	2,119.62	2,590.26	1502.32	4,539,098	4,539,098
Total	5,692.09	6,162.73	5,074.79	10,221,754	10,221,754

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	4.37	4.37	4.37	100.00	0.00	0.00	100	0	0
Enclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Regional Shopping Center	16.60	8.40	6.90	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.550545	0.057163	0.176442	0.142301	0.027646	0.003370	0.005334	0.008094	0.000262	0.000119	0.025903	0.000447	0.002375
Enclosed Parking with Elevator	0.537785	0.055838	0.172353	0.139003	0.027005	0.007196	0.011392	0.017285	0.000559	0.000254	0.025303	0.000954	0.005071
Parking Lot	0.537785	0.055838	0.172353	0.139003	0.027005	0.007196	0.011392	0.017285	0.000559	0.000254	0.025303	0.000954	0.005071
Regional Shopping Center	0.550545	0.057163	0.176442	0.142301	0.027646	0.003370	0.005334	0.008094	0.000262	0.000119	0.025903	0.000447	0.002375

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,390.9324	1,390.9324	0.0863	0.0105	1,396.2061
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,390.9324	1,390.9324	0.0863	0.0105	1,396.2061
NaturalGas Mitigated	0.0544	0.4656	0.2013	2.9700e-003		0.0376	0.0376		0.0376	0.0376	0.0000	538.6927	538.6927	0.0103	9.8800e-003	541.8939
NaturalGas Unmitigated	0.0544	0.4656	0.2013	2.9700e-003		0.0376	0.0376		0.0376	0.0376	0.0000	538.6927	538.6927	0.0103	9.8800e-003	541.8939

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	9.93808e+006	0.0536	0.4579	0.1949	2.9200e-003		0.0370	0.0370		0.0370	0.0370	0.0000	530.3338	530.3338	0.0102	9.7200e-003	533.4853
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	156640	8.4000e-004	7.6800e-003	6.4500e-003	5.0000e-005		5.8000e-004	5.8000e-004		5.8000e-004	5.8000e-004	0.0000	8.3589	8.3589	1.6000e-004	1.5000e-004	8.4086
Total		**0.0544**	**0.4656**	**0.2013**	**2.9700e-003**		**0.0376**	**0.0376**		**0.0376**	**0.0376**	**0.0000**	**538.6927**	**538.6927**	**0.0103**	**9.8700e-003**	**541.8939**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	9.93808e+006	0.0536	0.4579	0.1949	2.9200e-003		0.0370	0.0370		0.0370	0.0370	0.0000	530.3338	530.3338	0.0102	9.7200e-003	533.4853
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	156640	8.4000e-004	7.6800e-003	6.4500e-003	5.0000e-005		5.8000e-004	5.8000e-004		5.8000e-004	5.8000e-004	0.0000	8.3589	8.3589	1.6000e-004	1.5000e-004	8.4086
Total		**0.0544**	**0.4656**	**0.2013**	**2.9700e-003**		**0.0376**	**0.0376**		**0.0376**	**0.0376**	**0.0000**	**538.6927**	**538.6927**	**0.0103**	**9.8700e-003**	**541.8939**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	2.73637e+006	660.2910	0.0410	4.9600e-003	662.7945
Enclosed Parking with Elevator	1.99974e+006	482.5424	0.0299	3.6300e-003	484.3719
Parking Lot	163800	39.5253	2.4500e-003	3.0000e-004	39.6751
Regional Shopping Center	864368	208.5738	0.0129	1.5700e-003	209.3646
Total		**1,390.9324**	**0.0863**	**0.0105**	**1,396.2061**

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	2.73637e+006	660.2910	0.0410	4.9600e-003	662.7945
Enclosed Parking with Elevator	1.99974e+006	482.5424	0.0299	3.6300e-003	484.3719
Parking Lot	163800	39.5253	2.4500e-003	3.0000e-004	39.6751
Regional Shopping Center	864368	208.5738	0.0129	1.5700e-003	209.3646
Total		**1,390.9324**	**0.0863**	**0.0105**	**1,396.2061**

6.0 Area Detail

6.1 Mitigation Measures Area

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.3006	0.2042	7.2070	1.1600e-003		0.0494	0.0494		0.0494	0.0494	0.0000	152.7384	152.7384	0.0140	2.5900e-003	153.8599
Unmitigated	3.3006	0.2042	7.2070	1.1600e-003		0.0494	0.0494		0.0494	0.0494	0.0000	152.7384	152.7384	0.0140	2.5900e-003	153.8599

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2608					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.8082					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0143	0.1218	0.0518	7.8000e-004		9.8500e-003	9.8500e-003		9.8500e-003	9.8500e-003	0.0000	141.0446	141.0446	2.7000e-003	2.5900e-003	141.8827
Landscaping	0.2173	0.0824	7.1552	3.8000e-004		0.0396	0.0396		0.0396	0.0396	0.0000	11.6939	11.6939	0.0113	0.0000	11.9772
Total	**3.3006**	**0.2042**	**7.2070**	**1.1600e-003**		**0.0494**	**0.0494**		**0.0494**	**0.0494**	**0.0000**	**152.7384**	**152.7384**	**0.0140**	**2.5900e-003**	**153.8599**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2608					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.8082					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0143	0.1218	0.0518	7.8000e-004		9.8500e-003	9.8500e-003		9.8500e-003	9.8500e-003	0.0000	141.0446	141.0446	2.7000e-003	2.5900e-003	141.8827
Landscaping	0.2173	0.0824	7.1552	3.8000e-004		0.0396	0.0396		0.0396	0.0396	0.0000	11.6939	11.6939	0.0113	0.0000	11.9772
Total	**3.3006**	**0.2042**	**7.2070**	**1.1600e-003**		**0.0494**	**0.0494**		**0.0494**	**0.0494**	**0.0000**	**152.7384**	**152.7384**	**0.0140**	**2.5900e-003**	**153.8599**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	258.7412	1.6539	0.0405	312.1654
Unmitigated	258.7412	1.6539	0.0405	312.1654

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	45.0214 / 28.3831	231.8315	1.4805	0.0363	279.6546
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	5.27396 / 3.23243	26.9097	0.1734	4.2500e-003	32.5109
Total		**258.7412**	**1.6539**	**0.0405**	**312.1654**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	45.0214 / 28.3831	231.8315	1.4805	0.0363	279.6546
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	5.27396 / 3.23243	26.9097	0.1734	4.2500e-003	32.5109
Total		**258.7412**	**1.6539**	**0.0405**	**312.1654**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Toyota Arena Mixed Use Development - San Bernardino-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	79.6983	4.7100	0.0000	197.4492
Unmitigated	79.6983	4.7100	0.0000	197.4492

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	317.86	64.5227	3.8132	0.0000	159.8523
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	74.76	15.1756	0.8969	0.0000	37.5969
Total		**79.6983**	**4.7100**	**0.0000**	**197.4492**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	317.86	64.5227	3.8132	0.0000	159.8523
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	74.76	15.1756	0.8969	0.0000	37.5969
Total		**79.6983**	**4.7100**	**0.0000**	**197.4492**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Equipment Type	Number

11.0 Vegetation

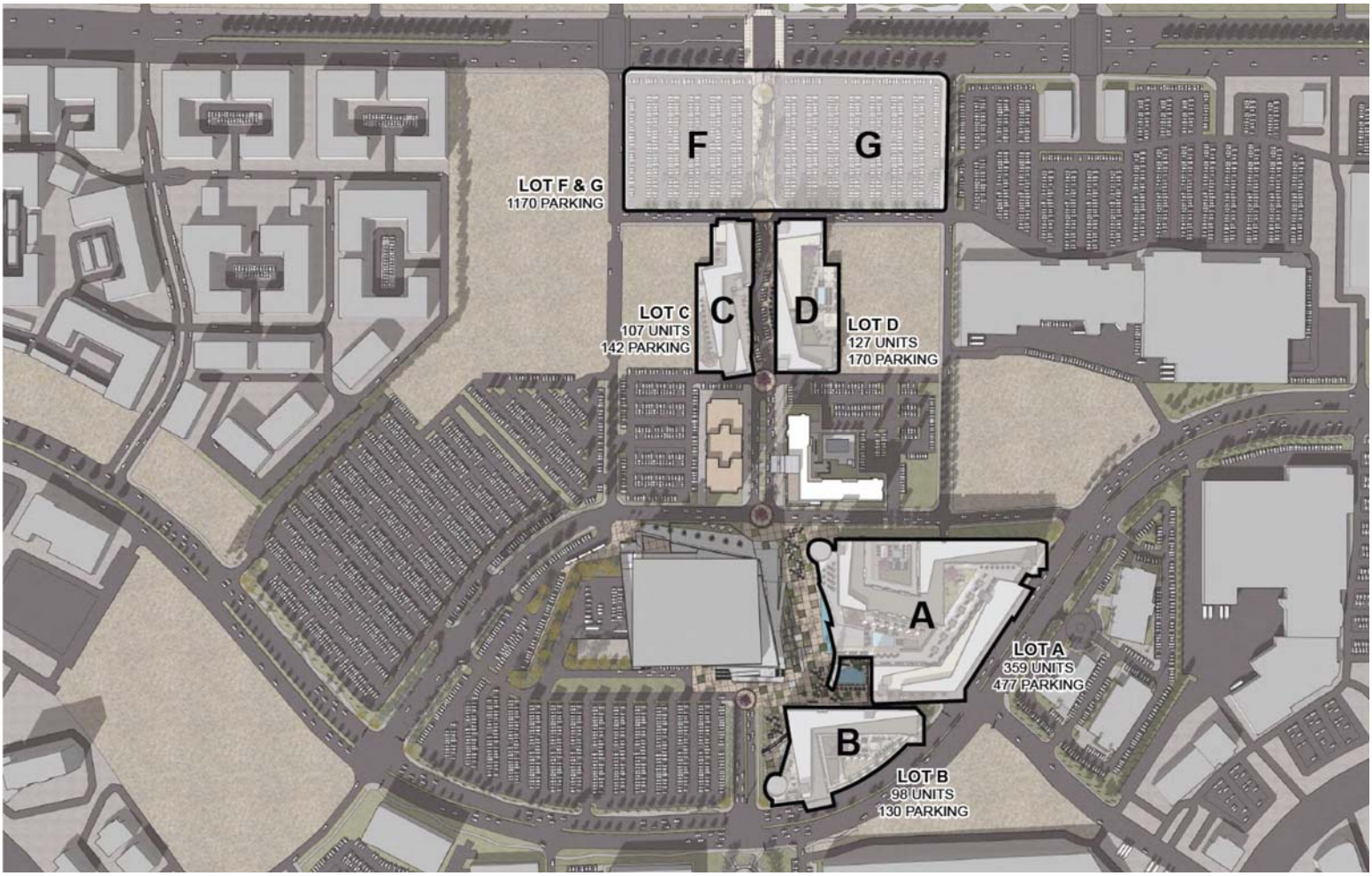
Appendix B

EMFAC2017 Vehicle Consumption Data

EMFAC2017 (v1.0.2) Emissions Inventory
Region Type: Air District
Region: South Coast AQMD
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC2011Categories
Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	CalYr	VehClass	Fuel	Population	VMT	Fuel_Consumption	Fuel Split (Gas:Diesel)	MPG, by Fuel Type	MPG, Average
SOUTH COAST AQMD	2023	LDA	GAS	6635002.295	252710542.7	7971.24403	99.38%	31.70	32.59
South Coast AQMD	2023	LDA	DSL	62492.97958	2469815.67	49.3916685	0.62%	50.00	
South Coast AQMD	2023	LDA	ELEC	150700.3971	6237105.777	0			
South Coast AQMD	2023	LDT1	GAS	758467.6481	27812996.47	1023.913006	99.96%	27.16	27.46
South Coast AQMD	2023	LDT1	DSL	360.7799144	8408.618214	0.366459477	0.04%	22.95	
South Coast AQMD	2023	LDT1	ELEC	7122.93373	303507.5334	0			
South Coast AQMD	2023	LDT2	GAS	2285150.139	85272415.53	3338.798312	99.47%	25.54	25.6
South Coast AQMD	2023	LDT2	DSL	15594.68309	650362.8069	17.73812611	0.53%	36.66	
South Coast AQMD	2023	LDT2	ELEC	28809.63735	917592.8423	0			
South Coast AQMD	2023	MDV	GAS	1589862.703	55684188.36	2693.883526	98.15%	20.67	20.81
South Coast AQMD	2023	MDV	DSL	36128.1019	1425691.372	50.65281491	1.85%	28.15	
South Coast AQMD	2023	MDV	ELEC	16376.67653	537591.7438	0			
South Coast AQMD	2023	LHD1	GAS	174910.3847	6216642.74	583.3851736	71.88%	10.66	13.81
South Coast AQMD	2023	LHD1	DSL	125545.0822	4994753.051	228.1779285	28.12%	21.89	
South Coast AQMD	2023	LHD2	GAS	30102.75324	1034569.096	111.5753864	53.28%	9.27	14.18
South Coast AQMD	2023	LHD2	DSL	50003.13116	1935029.912	97.84811618	46.72%	19.78	
South Coast AQMD	2023	MHDT	GAS	25624.3151	1363694.415	265.2060557	26.79%	5.14	9.58
South Coast AQMD	2023	MHDT	DSL	122124.488	8120623.353	724.7695868	73.21%	11.20	
South Coast AQMD	2023	HHDT	GAS	75.10442936	8265.097091	1.936286145	0.10%	4.27	6.94
South Coast AQMD	2023	HHDT	DSL	115130.71	13671497.32	1970.514243	99.90%	6.94	
South Coast AQMD	2023	OBUS	GAS	5955.291639	245774.0168	48.07750689	100.00%	5.11	5.11
South Coast AQMD	2023	OBUS	DSL	0	0	0	0.00%	0.00	
South Coast AQMD	2023	UBUS	GAS	957.7686184	89782.63172	17.62416327	98.66%	5.09	5.18
South Coast AQMD	2023	UBUS	DSL	13.00046095	1416.621572	0.239500509	1.34%	5.91	
South Coast AQMD	2023	UBUS	ELEC	16.11693886	1320.163255	0			
South Coast AQMD	2023	SBUS	GAS	2783.643068	112189.6089	12.19474692	30.76%	9.20	8.15
South Coast AQMD	2023	SBUS	DSL	6671.825716	210853.9115	27.44411242	69.24%	7.68	
South Coast AQMD	2023	MCY	GAS	305044.5141	2104623.657	57.849018	100.00%	36.38	36.38
South Coast AQMD	2023	MH	GAS	34679.50542	330042.9197	63.26295123	84.47%	5.22	6.07
South Coast AQMD	2023	MH	DSL	13122.69387	124302.0239	11.63031832	15.53%	10.69	

TOYOTA ARENA MIXED-USE DEVELOPMENT
NOISE IMPACT STUDY
City of Ontario



TOYOTA ARENA MIXED-USE DEVELOPMENT
NOISE IMPACT STUDY
City of Ontario, California

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May 28, 2021

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1.0 Introduction

1.1 Purpose of Analysis and Study Objectives

The purpose of this report is to evaluate the potential noise impacts from the proposed Toyota Arena Mixed-Use Development (project) and provide recommendations, if necessary, to minimize any project noise impacts. The assessment was conducted within the context of the California Environmental Quality Act (CEQA) and utilizes the noise standards set forth by the applicable Federal, State, and local agencies.

The following is provided in this report:

- A description of the study area and the proposed project
- Information regarding the fundamentals of noise
- Identification of the regulatory setting and applicable noise standards
- Analysis of the existing noise environment
- Analysis of the project's operational noise impact to adjacent receptors
- Analysis of the project's construction noise and vibration impact to adjacent sensitive receptors
- Summary of recommended mitigation measures and project design features to reduce noise level impacts.

1.2 Site Location

The proposed Toyota Arena Mixed-Use Development project site is located adjacent to the Toyota Arena, north of Concourse Street and south of Fourth Street, in the City of Ontario. The project site is located approximately 1,013 feet above sea level and the topography is relatively flat.

The project site location map is provided in Exhibit A.

The project site is located within the Ontario Center Specific Plan and zoned for Urban Commercial use. The City of Ontario General Plan land use map designates the project site as Mixed Use.

1.3 Project Description

The project consists of construction and operation of a mixed use town center development with residential and commercial/retail land use within four development lots.

The proposed project includes a total of 691 residential dwelling units, 71,200 square feet of commercial/retail uses and the demolition and relocation of approximately 1,170 surface parking spaces. The total project site area is approximately 18.73 acres.

The site plan used for this analysis, provided by the applicant, is illustrated in Exhibit B. Table 1 summarizes the proposed project land uses.

Table 1
Land Use Summary

Lot	Dwelling Units	Retail (SF)[1]	Parking Spaces
A	359	25,256	477[2]
B	98	20,802	130[2]
C	107	11,047	142[2]
D	127	14,095	170[2]
F & G	--	--	1,170
Total	691	71,200	2,089

[1] S.F. – Square Feet
[2] Parking Structure

This report analyzes long-term and short-term noise impacts associated with the day-to-day operation of the project. The primary sources of long-term noise impacts would be on-site circulation and parking lot noise and HVAC units.

1.4 Summary of Analysis Results

Table 2 provides a summary of the noise analysis results, per the CEQA impact criteria checklist. With the implementation of the recommended mitigation measures, the project is not expected to result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Table 2
CEQA Noise Impact Criteria

Noise Impact Criteria	Potentially Significant	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
Would the project result in?				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X	
b) Generation of excessive groundborne vibration or groundborne noise levels?			X	
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?			X	

1.5 Recommended Project Design Features

The following recommended project design features include standard rules and requirements, best practices and recognized design guidelines for reducing noise levels. Design features are assumed to be part of the conditions of the project and integrated into its design. Design features are not typically considered mitigation under CEQA.

Operational Design Features

DF-1 Prior to the issuance of building permits, the project shall prepare a final acoustical study that demonstrates building construction will achieve the minimum interior noise standard of 45 dBA CNEL for all residential units located along arterial roadways and/or adjacent to industrial uses, per the California Building Standards Code. The following noise control measures may be required for dwelling units located near adjacent roadways and industrial uses:

- Install sound barriers between residences and noise sources.
- Install double-paned or similar sound rated windows.

- Provide sound insulating exterior walls and roofing systems.
- Locate and/or design attic vents to minimize sound propagation into each home.
- Provide forced-air ventilation systems.
- Place dwellings as far as practical from the noise source

DF-2 The project shall comply with California Title 24 building insulation requirements for exterior walls, roofs and common separating assemblies (e.g. floor/ceiling assemblies and demising walls).

DF-3 For proper acoustical performance, all exterior windows, doors, and sliding glass doors should have a positive seal and leaks/cracks must be kept to a minimum.

DF-4 The final building plans shall ensure that HVAC units are not located within an area of the project site that would contribute to a noise level exceedance at any adjacent property line, per the City of Ontario Municipal Code requirements. To meet the City's noise standards the following measures should be followed:

- All HVAC equipment shall be shielded or enclosed from the line of sight of adjacent residential uses.

Construction Design Features

DF-5 Prepare a construction management plan and obtain a construction work permit from the City of Ontario prior to starting construction. The construction management plan shall ensure all contractors implement construction best management practices to reduce construction noise levels. Best management practices shall include the following:

- All construction equipment shall be equipped with muffles and other suitable noise attenuation devices (e.g., engine shields).

- Grading and construction contractors shall use quieter equipment as opposed to noisier equipment (such as rubber-tired equipment rather than track equipment), to the maximum extent feasible.

- If feasible, electric hook-ups shall be provided to avoid the use of generators. If electric service is determined to be infeasible for the site, only whisper-quiet generators shall be used (i.e., inverter generators capable of providing variable load.

- Use electric air compressors and similar power tools rather than diesel equipment, where feasible.

- Locate staging area, generators and stationary construction equipment as far from the adjacent residential homes as feasible.

- Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 5 minutes.

- Provide notifications and signage in readily visible locations along the perimeter of construction sites that indicate the dates and duration of construction activities, as well as provide a telephone number where neighbors can enquire about the construction process and register complaints to a designated construction noise disturbance coordinator.

- Construction activities shall not take place between the hours of 6:00 p.m. and 7:00 a.m. on weekdays and Saturday or Sunday between the hours of 9:00 a.m. and 6:00 p.m.

DF-6 No impact pile driving or blasting activities shall be permitted on the project site during construction. If impact pile driving or blasting is required, a follow-up noise and vibration impact assessment shall be conducted prior to start of any activity.

2.0 Fundamentals of Noise

This section of the report provides basic information about noise and vibration and presents some of the terms used in the report.

2.1 Sound, Noise, and Acoustics

The sound is a disturbance created by a moving or vibrating source and is capable of being detected by the hearing organs. The sound may be thought of as mechanical energy of a moving object transmitted by pressure waves through a medium to a human ear. For traffic or stationary noise, the medium of concern is air. *Noise* is defined as sound that is loud, unpleasant, unexpected, or unwanted.

2.2 Frequency and Hertz

A continuous sound is described by its *frequency* (pitch) and its *amplitude* (loudness). Frequency relates to the number of pressure oscillations per second. Low-frequency sounds are low in pitch (bass sounding) and high-frequency sounds are high in pitch (squeak). These oscillations per second (cycles) are commonly referred to as Hertz (Hz). The human ear can hear from the bass pitch starting out at 20 Hz all the way to the high pitch of 20,000 Hz.

2.3 Sound Pressure Levels and Decibels

The *amplitude* of a sound determines its loudness. The loudness of sound increases or decreases, as the amplitude increases or decreases. Sound pressure amplitude is measured in units of micro-Newton per square inch meter (N/m2), also called micro-Pascal (μPa). One μPa is approximately one hundred billionths (0.00000000001) of normal atmospheric pressure. Sound pressure level (SPL or L_p) is used to describe in logarithmic units the ratio of actual sound pressures to a reference pressure squared. These units are called decibels and abbreviated as dB.

2.4 Addition of Decibels

Because decibels are on a logarithmic scale, sound pressure levels cannot be added or subtracted by simple plus or minus addition. When two (2) sounds of equal SPL are combined, they will produce an SPL 3 dB greater than the original single SPL. In other words, sound energy must be doubled to produce a 3dB increase.

If two (2) sounds differ by approximately 10 dB the higher sound level is the predominant sound.

2.5 Human Response to Changes in Noise Levels[1]

In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, (A-weighted scale) and it perceives a sound within that range as being more intense than a sound with a higher or lower frequency with the same magnitude. For purposes of this report as well as with most environmental documents, the A-scale weighing is typically reported in terms of A-weighted decibel (dBA). Typically, the human ear can barely perceive the change in the noise level of 3 dB. A change in 5 dB is readily perceptible, and a change in 10 dB is perceived as being twice or half as loud. As previously discussed, a doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g. doubling the volume of traffic on a highway), would result in a barely perceptible change in sound level.

2.6 Noise Descriptors

Noise in our daily environment fluctuates over time. Some noise levels occur in regular patterns, others are random. Some noise levels are constant, while others are sporadic. Noise descriptors were created to describe the different time-varying noise levels. Following are the most commonly used noise descriptors along with brief definitions.

A-Weighted Sound Level

The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high-frequency components of the sound in a manner similar to the response of the human ear. A numerical method of rating human judgment of loudness.

Ambient Noise Level

The composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

[1] Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013.

Community Noise Equivalent Level (CNEL)

The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five (5) decibels to sound levels in the evening from 7:00 to 10:00 PM and after addition of ten (10) decibels to sound levels in the night before 7:00 AM and after 10:00 PM.

Decibel (dB)

A unit for measuring the amplitude of a sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micro-pascals.

dB(A)

A-weighted sound level (see definition above).

Equivalent Sound Level (LEQ)

The sound level corresponding to a steady noise level over a given sample period with the same amount of acoustic energy as the actual time-varying noise level. The energy average noise level during the sample period.

Habitable Room

Any room meeting the requirements of the Uniform Building Code or other applicable regulations which is intended to be used for sleeping, living, cooking or dining purposes, excluding such enclosed spaces as closets, pantries, bath or toilet rooms, service rooms, connecting corridors, laundries, unfinished attics, foyers, storage spaces, cellars, utility rooms, and similar spaces.

L(n)

The A-weighted sound level exceeded during a certain percentage of the sample time. For example, L10 in the sound level exceeded 10 percent of the sample time. Similarly, L50, L90, and L99, etc.

Noise

Any unwanted sound or sound which is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying. The State Noise Control Act defines noise as "...excessive undesirable sound...".

Percent Noise Levels

See L(n).

Sound Level (Noise Level)

The weighted sound pressure level obtained by use of a sound level meter having a standard frequency-filter for attenuating part of the sound spectrum.

Sound Level Meter

An instrument, including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement and determination of noise and sound levels.

Single Event Noise Exposure Level (SENEL)

The dBA level which, if it lasted for one (1) second, would produce the same A-weighted sound energy as the actual event.

2.7 Sound Propagation

As sound propagates from a source it spreads geometrically. The sound from a small, localized source (i.e., a point source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates at a rate of 6 dB per doubling of distance. The movement of vehicles down a roadway makes the source of the sound appear to propagate from a line (i.e., line source) rather than a point source. This line source results in the noise propagating from a roadway in a cylindrical spreading versus a spherical spreading that results from a point source. The sound level attenuates for a line source at a rate of 3 dB per doubling of distance.

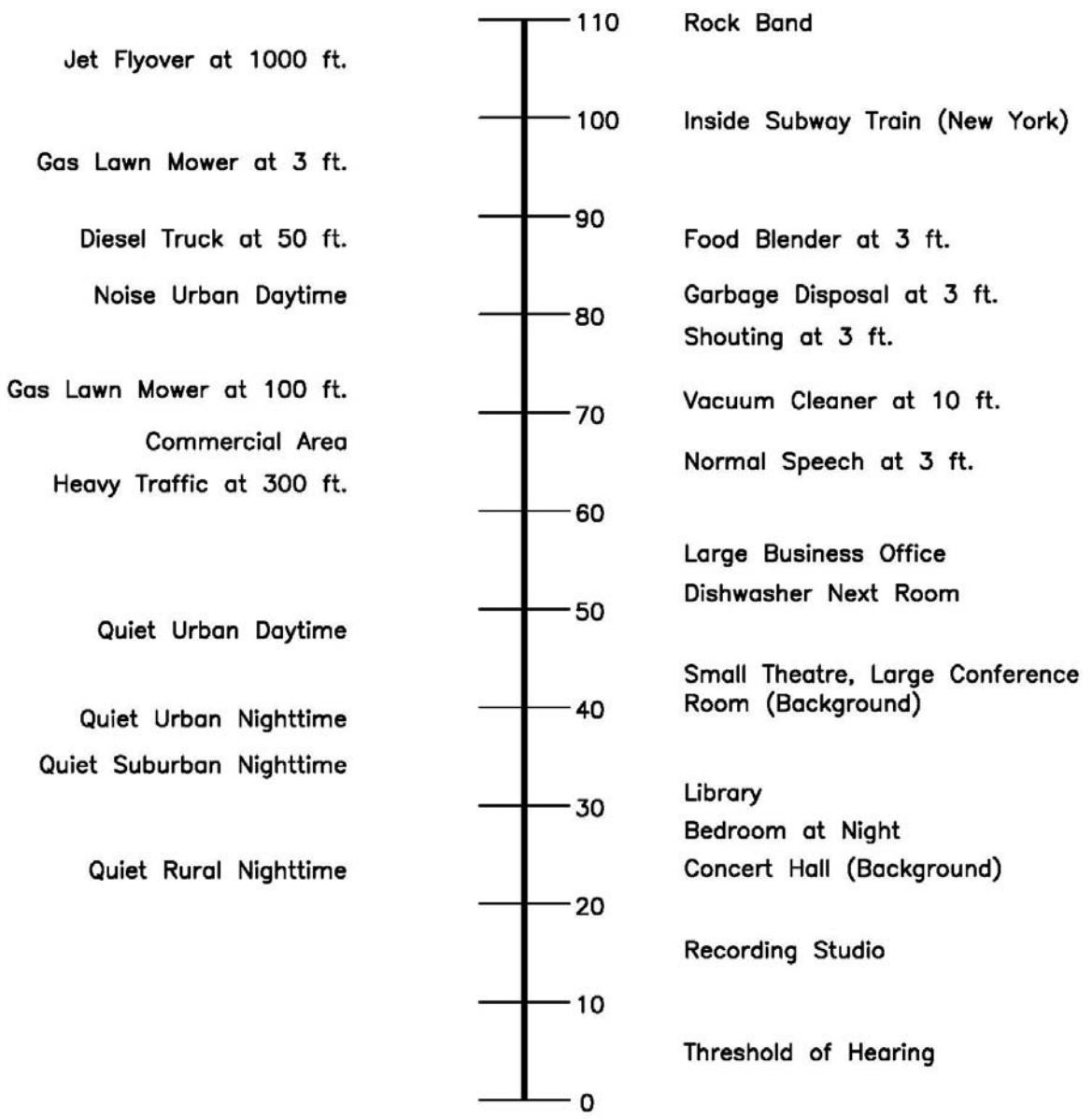
As noise propagates from the source, it is affected by the ground and atmosphere. Noise models use the hard site (reflective surfaces) and soft site (absorptive surfaces) to help calculate predicted noise levels. Hard site conditions assume no excessive ground absorption between the noise source and the receiver. Soft site conditions such as grass, soft dirt or landscaping attenuate noise at an additional rate of 1.5 dB per doubling of distance. When added to the geometric spreading, the excess ground attenuation results in an overall noise attenuation of 4.5 dB per doubling of distance for a line source and 6.0 dB per doubling of distance for a point source.

Research has demonstrated that atmospheric conditions can have a significant effect on noise levels when noise receivers are located 200 feet and greater from a noise source. Wind, temperature, air humidity, and turbulence can further impact how far sound can travel.

Figure 1 shows typical sound levels from indoor and outdoor noise sources.

Figure 1[2]

TYPICAL SOUND LEVELS FROM
INDOOR AND OUTDOOR NOISE SOURCES



[2] Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013.

2.8 Vibration Descriptors

Ground-borne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically only cause a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Ground-borne noise is an effect of ground-borne vibration and only exists indoors since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

Several different methods are used to quantify vibration amplitude.

PPV

Known as the peak particle velocity (PPV) which is the maximum instantaneous peak in vibration velocity, typically given in inches per second.

RMS

Known as the root mean squared (RMS) can be used to denote vibration amplitude.

VdB

A commonly used abbreviation to describe the vibration level (VdB) for a vibration source.

2.9 Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Outdoor sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration. To counter the effects of ground-borne vibration, the Federal Transit Administration (FTA) has published guidance relative to vibration impacts.

2.10 Vibration Propagation

There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wavefront, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wavefront. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wavefront. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

2.11 Construction Related Vibration Level Prediction[3]

Operational activities are separated into two different categories. The vibration can be transient or continuous in nature. Each category can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the project area site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. The thresholds from Caltrans Transportation and Construction Vibration Guidance Manual, April 2020, in the table below provide general guidelines as to the maximum vibration limits for when vibration becomes potentially annoying.

[3] Caltrans Transportation and Construction Vibration Guidance Manual, April 2020

Table 3
Vibration Annoyance Potential Criteria

Human Response	PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.90	0.10
Severe	2.00	0.40

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

The Caltrans Transportation and Construction Vibration Guidance Manual, April 2020 provides general thresholds and guidelines as to the vibration damage potential from vibratory impacts. The table below provides general vibration damage potential thresholds:

Table 4
Vibration Damage Potential Threshold Criteria

Structure and Condition	PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings ruin ancient monuments	0.12	0.08
Fragile buildings	0.20	0.10
Historic and some old buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial/commercial buildings	2.00	0.50

Soil conditions have an impact on how vibration propagates through the ground. The Caltrans Transportation and Construction Vibration Guidance Manual, April 2020 provides suggested "n" values based on soil class. The table below outlines the manual's suggested values and description.

Table 5
Suggested "n" Values Based on Soil Classes

Soil Class	Description of Soil Material	Suggested Value of "n"
I	Weak or soft soils: loose soils, dry or partially saturated peat and muck, mud, loose beach sand, and dune sand.	1.4
II	Most sands, sandy clays, silty clays, gravel, silts, weathered rock.	1.3
III	Hard soils: densely compacted sand, dry consolidated clay, consolidated glacial till, some exposed rock.	1.1
IV	Hard, component rock: bedrock, freshly exposed hard rock.	1.0

3.0 Regulatory Setting

The proposed project is located in the City of Ontario and noise regulations are addressed through the various federal, state, and local government agencies. The agencies responsible for regulating noise are discussed below.

3.1 Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three (3) purposes:

- Publicize noise emission standards for interstate commerce
- Assist state and local abatement efforts
- Promote noise education and research

The Federal Office of Noise Abatement and Control (ONAC) was originally tasked with implementing the Noise Control Act. However, it was eventually eliminated leaving other federal agencies and committees to develop noise policies and programs. Some examples of these agencies are as follows: The Department of Transportation (DOT) assumed a significant role in noise control through its various agencies. The Federal Aviation Agency (FAA) is responsible to regulate noise from aircraft and airports. The Federal Highway Administration (FHWA) is responsible to regulate noise from the interstate highway system. The Occupational Safety and Health Administration (OSHA) is responsible for the prohibition of excessive noise exposure to workers.

The Federal government and the State advocate that local jurisdiction use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being constructed adjacent to a highway or, or alternatively that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the Federal government and the State have preempted the setting of standards for noise levels that can be emitted by the transportation source, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

3.2 State Regulations

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regularity tools to control and abate noise for use by local agencies. One significant model is the "Land Use Compatibility for Community Noise Environments Matrix." The matrix allows the local jurisdiction to clearly delineate compatibility of sensitive uses with various incremental levels of noise.

The State of California has established noise insulation standards as outlined in Title 24 and the Uniform Building Code (UBC) which in some cases requires acoustical analyses to outline exterior noise levels and to ensure interior noise levels do not exceed the interior threshold. The State mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

Noise insulation design standards for residences have been established by the State of California Uniform Building Code (UBC) Chapter 12, Division II and by the Title 24 noise insulation standards of the California Administrative Code. The City is required by the State Housing Law to adopt these State codes as minimum performance standards. The City may enact stricter noise standards throughout the city or on a case-by-case basis if deemed necessary. In brief, the Title 24 noise standards require the following for multi-family dwellings:

1. Party wall and floor-ceiling assembly designs must provide a minimum STC of 50, based on lab tests. Field tested assemblies must provide a minimum noise isolation class (NIC) of 45.

2. Floor-ceiling assembly designs must provide for a minimum impact insulation class (IIC) of 50, based on lab tests. Field tested assemblies must provide a minimum FIIC of 45.

3. Entry doors from interior corridors must provide an STC of 26 or more.

4. Penetrations or openings in sound rated assemblies must be treated to maintain required ratings.

5. Interior noise levels due to exterior sources must not exceed a community noise equivalent level (CNEL) or a day-night level (LDN) of 45 dBA, in any habitable room.

Thus, the interior limit is 45 dBA CNEL between dwelling units and from exterior noise sources to interior living spaces.

3.3 City of Ontario Noise Regulations

The project is required to comply with the noise standards and thresholds established within the City of Ontario Municipal Code and the Ontario Plan. The noise standards from the Municipal Code and the Ontario Plan are provided in Appendix A.

3.3.1 City of Ontario Municipal Code Noise Standards

The City of Ontario Municipal Code, Chapter 29: Noise, requires that a project shall not create loud, unnecessary, or unusual noise that disturbs the peace or quiet of any neighborhood, or that causes discomfort or annoyance to any person of normal sensitiveness.

Exterior Noise Standards:

Noise standards are defined in Section 5-29.04, Exterior Noise Standards of the Noise chapter of the Municipal Code and are applicable to the project site and surrounding noise sensitive uses.

Table 6 shows the exterior noise standards from the City of Ontario Municipal Code Chapter 29: Noise Exterior Noise Standards for the project site and surrounding residential land uses.

Table 6
City of Ontario Municipal Code Exterior Noise Standards

Land Use	7:00 AM – 10:00 PM	10:00 PM – 7:00 AM
	Leq (dBA)	Leq (dBA)
Multi-Family Residential	65	50
Residential Portion of Mixed Use	70	70
Commercial Property	65	60

[1]Applies to that portion of residential property falling within 100 feet of a commercial property use, if the noise originates from that commercial property use.

Interior Noise Standards:

Noise standards are defined in Section 5-29.05 Interior Noise Standards of the Noise chapter of the Municipal Code and are applicable to the project site and surrounding noise sensitive uses.

Table 7 shows the exterior noise standards from the City of Ontario Municipal Code Chapter 29: Noise Interior Noise Standards for the project land uses.

Table 7
City of Ontario Municipal Code Interior Noise Standards

Land Use	7:00 AM – 10:00 PM	10:00 PM – 7:00 AM
	Leq (dBA)	Leq (dBA)
Multi-Family Residential	45	40
Residential Portion of Mixed Use[1]	45	40

[1]Applies to that portion of residential property falling within 100 feet of a commercial property use, if the noise originates from that commercial property use.

Construction Noise Regulations

Chapter 29: Noise, Section 5-29.06 of the City's municipal code states that the following activities shall be exempted from the provisions of the noise code;

- Noise sources associated with construction, repair, remodeling, demolition or grading of any real property. Such activities shall instead be subject to the following provisions of § 5-29.09;

  i. No person, while engaged in construction, remodeling, digging, grading, demolition or any other related building activity, shall operate any tool, equipment or machine in a manner that produces loud noise that disturbs a person of normal sensitivity who works or resides in the vicinity, or a Police or Code Enforcement Officer, on any weekday except between the hours of 7:00 a.m. and 6:00 p.m. or on Saturday or Sunday between the hours of 9:00 a.m. and 6:00 p.m.

  ii. No landowner, construction company owner, contractor, subcontractor, or employer shall permit or allow any person or persons working under their

direction and control to operate any tool, equipment or machine in violation of the provisions of this section.

3.3.2 City of Ontario General Plan (The Ontario Plan)

The Ontario Plan establishes planning criteria for determining a development's noise/land use compatibility based on the community noise equivalent level (CNEL). CNEL noise levels are typically used to evaluate mobile source noise impacts such as from roadways, airports and rail lines.

Table 8 summarizes the City's Noise/Land Use Compatibility guidelines for the project and surrounding land uses.

Table 8
Noise/Land Use Compatibility Guidelines

Land Use	Noise Limit (CNEL)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential – Multiple Family	<60	60-65	65-75	>75
Commercial – Retail	<70	70-75	75-80	>80

Clearly Acceptable: No special noise insulation required, assuming buildings of normal conventional construction.

Normally Acceptable: Acoustical reports will be required for major new residential construction. Conventional construction with closed windows and fresh air supply systems of air conditioning will normally suffice.

Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included.

Clearly Unacceptable: No new construction should be permitted.

4.0 Study Method and Procedures

The following section describes the measurement procedures, measurement locations, and noise modeling procedures and assumptions used in the noise analysis.

4.1 Measurement Procedures and Criteria

Noise measurements are taken to determine the existing noise levels. A noise receiver or receptor is any location in the noise analysis in which noise might produce an impact. The following criteria are used to select measurement locations and receptors:

- Locations expected to receive the highest noise impacts, such as the first row of houses
- Locations that are acoustically representative and equivalent of the area of concern
- Human land usage
- Sites clear of major obstruction and contamination

RK conducted the sound level measurements in accordance with Caltrans technical noise specifications. All measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (S1.4: Specification of Sound Level Meters, 1983).

A Piccolo-II Type 2 integrating-averaging level meter was used to conduct long-term (24-hour) noise measurements at the project site and property boundaries.

The Leq, Lmin, Lmax, L2, L8, L25, and L50 statistical data were recorded over the measurement time period intervals and the information was utilized to define the noise characteristics for the project. The following gives a brief description of the Caltrans Technical Noise Supplement procedures for sound level measurements:

- Microphones for sound level meters were placed five (5) feet above the ground for long-term noise measurements
- Sound level meters were calibrated before and after each measurement
- Following the calibration of equipment, a windscreen was placed over the microphone
- Frequency weighting was set on "A" and slow response
- Temperature and sky conditions were observed and documented

Appendix B includes photos, field sheets, and measured noise data.

4.2 Stationary Noise Modeling

The stationary noise was projected using a computer program that replicates the FHWA Noise Prediction Model (FHWA-RD-77-108). The FHWA model arrives at the predicted noise level through a series of adjustments to the reference energy noise level. For stationary source, the following noise level was applied to the model. The model outputs the projected noise level based on the following key parameters:

- Referenced noise level – (e.g. how loud a source is at a specific distance)
- Vertical and horizontal distances (sensitive receptor distance from noise source)
- Noise barrier vertical and horizontal distances (noise barrier distance from sound source and receptor).
- Typical noise source spectra
- Topography

Table 9 indicates the referenced noise level used in this analysis.

Table 9
Stationary Source Noise Level

Source	Distance from Source (feet)	Noise Levels (dBA)
		Leq
HVAC Condenser Unit	3.0	77.0
Parking Lot	6.0	63.8

To estimate the future noise levels during typical conditions, RK adjusted the reference noise levels from noise source to the nearest receptors. Adjusted noise levels are based on the distance of the receptor location relative to the noise source and local topography. The noise levels assume that the stationary sources are operating continuously when in reality not all noise sources will operate continuously throughout the day and night.

4.3 Construction Noise Modeling

The construction noise analysis utilizes the Federal Highway Administration (FHWA) Roadway Construction Noise Model, together with several key construction parameters. Key inputs include distance to the sensitive receiver, equipment usage, and baseline

parameters for the project site. This study evaluates the potential exterior noise impacts during each phase of construction. Noise levels were projected at an average distance of 160 feet to the nearest residential (to the north of Log F and Lot G) sensitive receptor of equipment operating over an 8-hour period from to the nearest sensitive receptor property line

- Construction phasing and equipment usage assumptions are referenced from the Toyota Arena Mixed Use Development AQ & GHG Study, by RK Engineering, June 2021.

4.4 Interior Noise Modeling

The interior noise level is the difference between the projected exterior noise level at the structure's façade and the noise reduction provided by the structure itself. Typical building construction will provide a conservative 12 dBA noise level reduction with a "windows open" condition and a very conservative 20 dBA noise level reduction with "windows closed". RK estimated the interior noise level by subtracting the building shell design from the estimated exterior noise level.

The interior noise analysis is based on industry standards for building noise reduction established by the Federal Highway Administration (FHWA), the 2013 Caltrans Technical Noise Supplement to the Traffic Noise Analysis Protocol (TeNS), the California Office of Noise Control Catalog of STC and IIC Ratings for Wall and Floor/Ceiling Assemblies, and the California Building Standards Code, Title 24.

The TeNS manual shows that the noise reduction due to building exteriors with ordinary sash windows (windows closed) is at least 20 decibels. By providing upgraded STC rated windows, the project design is considered adequate to meet interior noise standards. The building's exterior walls will be constructed per the latest building code insulation requirements and provide occupants with the most protection from exterior noise. Insulated exterior walls, designed per the latest California Building Standards, would provide a minimum of STC 35-40. Windows, on the other hand, are one of the acoustically weakest parts of the structure. Therefore, for a conservative estimate of preliminary interior noise, the building's noise reduction potential is limited to the STC of the windows.

4.5 Construction Vibration Modeling

The construction vibration assessment is based on the methodology set-forth within the Caltrans Transportation and Construction Induced Vibration Guidance Manual. The

vibration impacts from vibratory rollers and compactors, heavy truck loading and bulldozer activity is analyzed. All vibratory activity is analyzed as a continuous and/or frequent event and is required to comply with the applicable guidance thresholds criteria. It is expected that vibration levels will be highest during paving phase. No impact pile driving is expected as part of this project.

Vibratory impacts were calculated from the site area property line to the closest sensitive receptors and structures using the reference vibration levels, soil conditions and the reference equation *PPV= PPV ref (25/D)^n (in/sec)* (from Caltrans Manual) where:

PPV = reference measurement at 25 feet from vibration source
D = distance from equipment to property line
n= vibration attenuation rate through ground (n=1.0 was utilized for this study)

5.0 Existing Noise Environment

The existing noise environment for the project site and surrounding area has been established based on noise measurement data collected by RK.

5.1 Long-Term (24-Hour) Noise Measurement Results

To determine the existing noise level environment, RK conducted four (4) 24-hour noise measurements at the project study area.

Noise levels were measured on April 7, 2021 using a Piccolo-II Type 2 integrating-averaging sound level meter. The information was utilized to establish the noise characteristics of the existing ambient environment.

The noise monitoring locations were selected based on the proximity and location to adjacent sensitive receptors. Exhibit C graphically illustrates the location of the long-term measurements.

- Long-term noise monitoring location one (LT-1) was taken along southwest corner of Fourth Street and Via Piemonte approximately 140 feet south of the centerline of Fourth Street.

- Long-term noise monitoring location two (LT-2) was taken east of Porsche Way, approximately 60 feet north of the La Quinta Inn property line.

- Long-term noise monitoring location three (LT-3) was taken northwest corner of Concours Street and Ferrari Street, approximately 110 feet to the west from the centerline of Concours Street.

- Long-term noise monitoring location four (LT-4) was taken in the parking lot, approximately 450 feet to the north from the centerline of Concours Street.

Long term noise monitoring locations represent the existing noise levels near the adjacent noise sensitive land uses. Long-term noise measurement results are summarized in Table 10, Table 11, Table 12 and Table 13. Appendix B includes photographs, field sheets and measured noise data.

Table 10
24 Noise Measurement Results LT-1[1]

Time	Leq (dBA)	Time	Leq (dBA)
12:00 AM	52.5	12:00 PM	58.9
1:00 AM	49.3	1:00 PM	59.5
2:00 AM	50.7	2:00 PM	57.4
3:00 AM	51.5	3:00 PM	58.4
4:00 AM	53.4	4:00 PM	62.6
5:00 AM	59.2	5:00 PM	59.9
6:00 AM	58.2	6:00 PM	59.8
7:00 AM	59.1	7:00 PM	58.6
8:00 AM	57.4	8:00 PM	58.2
9:00 AM	55.3	9:00 PM	56.2
10:00 AM	58.6	10:00 PM	55.1
11:00 AM	57.8	11:00 PM	51.8
24-Hour CNEL			**62.5**

[1] LT-1 was taken along southwest corner of Fourth Street and Via Piemonte approximately 140 feet south of the centerline of Fourth Street. LT-1 was recorded on 04/07/2021.

Table 11
24 Noise Measurement Results, LT-2[1]

Time	Leq (dBA)	Time	Leq (dBA)
12:00 AM	50.1	12:00 PM	50.2
1:00 AM	49.4	1:00 PM	50.8
2:00 AM	49.7	2:00 PM	52.3
3:00 AM	50.5	3:00 PM	52.8
4:00 AM	49.5	4:00 PM	53.8
5:00 AM	57.7	5:00 PM	53.4
6:00 AM	54.7	6:00 PM	52.1
7:00 AM	53.0	7:00 PM	52.6
8:00 AM	50.1	8:00 PM	56.1
9:00 AM	48.5	9:00 PM	49.7
10:00 AM	50.5	10:00 PM	50.8
11:00 AM	50.6	11:00 PM	50.3
24-Hour CNEL			**59.2**

[1] LT-2 was taken east of Porsche Way, approximately 60 feet north of La Quinta Inn property line. LT-2 was recorded on 04/07/2021.

Table 12
24 Noise Measurement Results, LT-3[1]

Time	Leq (dBA)	Time	Leq (dBA)
12:00 AM	52.5	12:00 PM	56.2
1:00 AM	45.8	1:00 PM	56.8
2:00 AM	49.0	2:00 PM	55.1
3:00 AM	49.8	3:00 PM	58.1
4:00 AM	51.7	4:00 PM	57.3
5:00 AM	52.3	5:00 PM	59.2
6:00 AM	54.8	6:00 PM	57.1
7:00 AM	55.8	7:00 PM	57.2
8:00 AM	55.0	8:00 PM	56.7
9:00 AM	57.6	9:00 PM	53.1
10:00 AM	58.1	10:00 PM	53.0
11:00 AM	55.7	11:00 PM	57.5
24-Hour CNEL			**60.6**

[1] LT-3 was taken northwest corner of Concours Street and Ferrari Street, approximately 110 feet to the west from the centerline of Concours Street. LT-2 was recorded on 04/07/2021.

Table 13
24 Noise Measurement Results, LT-4[1]

Time	Leq (dBA)	Time	Leq (dBA)
12:00 AM	39.2	12:00 PM	44.5
1:00 AM	38.8	1:00 PM	43.8
2:00 AM	40.0	2:00 PM	43.8
3:00 AM	39.1	3:00 PM	46.7
4:00 AM	38.6	4:00 PM	44.8
5:00 AM	40.5	5:00 PM	43.3
6:00 AM	44.0	6:00 PM	42.2
7:00 AM	44.8	7:00 PM	40.8
8:00 AM	48.4	8:00 PM	39.8
9:00 AM	59.3	9:00 PM	39.9
10:00 AM	50.7	10:00 PM	39.3
11:00 AM	44.9	11:00 PM	40.5
24-Hour CNEL			**49.9**

[1] LT-4 was taken in the parking lot, approximately 450 feet to the north from the centerline of Concours Street. LT-4 was recorded on 04/07/2021.

6.0 Operational Noise Impacts

This assessment analyzes the anticipated noise levels generated by the project. The main sources of noise generated by the project would include vehicular traffic noise along the adjacent roadways. Noise level impacts are compared to the City of Ontario noise standards.

The project must demonstrate that noise levels generated by the project site would not result in a permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

6.1 Stationary Source Noise Impacts

The project is not expected to consist of significant sources of stationary noise. The main sources of potential stationary noise impacts from the project would mainly include on-site circulation and parking lot noise, HVAC units and outdoor conversational noise.

The types of on-site noise from the project are typically considered compatible with other adjacent commercial/mixed use and would not typically be categorized as loud, unnecessary, or unusual noise that disturbs the peace or quiet of any neighborhood, or that causes discomfort or annoyance to any person of normal sensitiveness. In particular, social activities and vehicular related noise are generally substantially less during the noise sensitive nighttime hours. Although, mechanical HVAC equipment does have the potential to operate 24-hours a day.

Rooftop mechanical HVAC equipment are expected to be located at the center of each building. The nearest noise sensitive residential receptors are located approximately 750 feet away to the west of the proposed Lot C HVAC units and the noise impacts from the operation of mechanical HVAC equipment is expected to be not significant at this distance. Therefore, a preliminary evaluation of noise impacts at the adjacent commercial uses has been provided.

Parking lot noise would occur from vehicle engine idling and exhaust, doors slamming, tires screeching, people talking, and the occasional horn honking. Parking lot noise is expected to occur on Lot F and Lot G and is conservatively assessed from the first parking space to northern residential properties; approximately 160 feet away.

The proposed site plan shows commercial/retail uses will face Via Piemonte and would be mostly shielded from the line of sight from the adjacent receptor property lines. Therefore, the outdoor conversational noise from the commercial/retail uses would not substantially contribute noise impacts to adjacent properties and was not included as a part of this analysis.

Table 14
Stationary Noise Impact Analysis[1]

Receptor			Stationary Noise Source				Combined Exterior Noise Level (Leq) dBA	
Number[2]	Land Use	Location	Source	Location	Distance[3]	Noise Level (Leq) dBA	Daytime[4]	Nighttime[4]
1	Residential	North of Lot F & Lot G	Parking Lot	Lot F & Lot G	160	34.8	34.8	34.8
2	Residential	West of Lot C	HVAC	Lot C	510	32.2	32.6	32.6
			Parking Lot	Lot F	735	21.9		
City of Ontario Residential Exterior Standard Levels							**65.0**	**50.0**
Noise Level Exceeds Standard (?)							**No**	**No**
3	Commercial	South of Lot C and Lot D	HVAC	Lot A	213	39.6	43.7	43.7
			HVAC	Lot C	243	38.5		
			HVAC	Lot D	243	38.5		
			Parking Lot	Lot F & Lot G	530	24.7		
4	Commercial	East of Lot D	HVAC	Lot D	485	32.7	36.6	36.6
			Parking Lot	Lot G	170	34.3		
5	Commercial	East of Lot A	HVAC	Lot A	213	39.6	42.4	42.4
			HVAC	Lot B	525	39.1		
6	Commercial	South of Lot B	HVAC	Lot A	580	31.1	39.0	39.0
			HVAC	Lot B	250	38.2		
City of Ontario Commercial Exterior Standard Levels							**65.0**	**60.0**
Noise Level Exceeds Standard (?)							**No**	**No**

[1] Stationary noise calculation worksheets are shown in Appendix C.
[2] Refer Exhibit A for Receptor Location.
[3] Distance from the receptor to the nearest noise source.
[4] Daytime: (7:00 A.M. to 10:00 P.M.); Nighttime: (10:00 P.M. to 7:00 A.M.)

As shown in Table 14, operational noise levels generated by the project are not expected to exceed the City's daytime standards and nighttime noise standards at the nearest receptor property line for both commercial and residential uses. Stationary noise calculation worksheets are shown in Appendix C.

6.2 Preliminary Interior Noise Analysis

Traffic noise along the adjacent roadways is expected to be the primary source of ambient noise impacting future residents at the project site. Traffic noise is analyzed to determine the project's noise/land use compatibility setting and to determine future noise levels to habitable exterior and interior areas on the project site. This section of the analysis does not necessarily apply to CEQA, as recent court rulings have indicated that CEQA is primarily concerned with the project's impact of the environment, not the environment's impact on a project.

Future traffic noise along the roadways is obtained from The Ontario Plan Figure S-3a, Future Roadway Noise Contours and represents the noise levels at the project site.

Table 15 shows the estimated future traffic noise levels at the project site and the noise/land use compatibly rating based on the City of Ontario General Plan Table LU-7 standards. The Ontario Plan Noise Level Exposure and Land Use Compatibility Guidelines is provided in Appendix A.

Table 15
Future Traffic Noise Levels[1]

Receptor	Exterior Noise Level (Ldn) (dBA CNEL)	Noise/Land Use Compatibility
Multifamily Residential	65-70	Normally Unacceptable
Retail	65-70	Normally Acceptable

[1] Source: The City of Ontario General Plan Table LU-7

The project may experience noise levels that fall within the normally unacceptable range (65-75 CNEL) for the residential part of the project and clearly acceptable (65-70 CNEL) for the retail part of the project. Hence, upgraded building construction techniques are expected to be required to achieve interior noise level standards for the residential uses.

Based on Section 5, the existing noise levels (CNEL) nearest the project site range from 60.6 CNEL to 62.5 CNEL. It should be noted that the existing noise levels were taken during typical weekday conditions and do not include noise levels during an event at the Toyota Arena event center, which may further increase noise levels (i.e., traffic) in the area. Therefore, in order to be conservative, the higher limit of the future traffic noise levels at the project site (70 dBA CNEL) has been utilized to conduct preliminary interior noise analysis.

A preliminary interior noise analysis has been prepared for the sensitive receptor locations using a typical "windows open" and "windows closed" condition. A "windows open" condition assumes 12 dBA of noise attenuation from the exterior noise level. A "windows closed" condition" assumes 20 dBA of noise attenuation from the exterior noise level.

Table 16 indicates the interior noise levels for the residential uses on the project site.

Table 16
Preliminary Interior Noise Impact Analysis

Receptor Location	Exterior Noise Level at Building Facade (CNEL)	Interior Noise Standard (CNEL)	Required Building Shell Noise Reduction (CNEL)	Interior Noise Level with Standard California Construction Windows (STC ≥ 25)		STC Rating for Windows Facing Subject Roadway
				"Windows Open" [1]	"Windows Closed" [2]	
Multifamily Residential	70	45.0	25	58	50	28

[1] A minimum of 12 dBA noise reduction is assumed with the "windows open" condition.
[2] A minimum of 20 dBA noise reduction is assumed with the "windows closed" condition.

The project is expected to require a "windows closed" condition and upgraded STC rated windows to meet the City/State interior noise standard of 45 dBA. To accommodate a windows closed conditions, all units shall be equipped with adequate fresh air ventilation, per the requirements of the California Uniform Building Code (UBC).

Prior to issuance of building permits, the project proponent should demonstrate to the City building department that the proposed building shell and window assemblies will achieve exterior to interior noise reduction necessary to meet the State of California and City of Ontario requirements.

Furthermore, the project shall comply with California Title 24 insulation building requirements for multi-family dwelling units for common separating assemblies (e.g. floor/ceiling assemblies and demising walls).

6.3 Los Angeles Ontario International Airport (LAONT)

The Los Angeles Ontario International Airport (LAONT) is centrally located in the City of Ontario. The airport is a medium-hub, full-service airport. Traffic at the airport includes general aviation, commercial passenger aviation, and air cargo freight movement. LAONT is a member of the Los Angeles World Airport (LAWA) system. LAWA is currently developing a Master Land Use Plan for LAONT that will provide a framework for the airport's development and use through the year 2030.

The LAONT is located approximately one and a quarter (1.25) miles to the northeast of the project site. A noise/land use compatibility assessment has been performed based on the project's location to the LAONT Airport. The noise contour maps for the LAONT Airport are provided in Exhibit D.

The project is located outside of the 60 dB Ldn noise contour limit; therefore, the exterior noise impact from the airport would be within the allowable limits for residential land uses and the project is considered compatible with the surrounding land use and noise environment. Noise from airport operations is expected to generate a less than significant on the proposed project.

6.4 Recommended Operational Design Features

The following recommended project design features include standard rules and requirements, best practices and recognized design guidelines for reducing noise levels. Design features are assumed to be part of the conditions of the project and integrated into its design. Design features are not typically considered mitigation under CEQA.

DF-1 Prior to the issuance of building permits, the project shall prepare a final acoustical study that demonstrates building construction will achieve the minimum interior noise standard of 45 dBA CNEL for all residential units located along arterial roadways and/or adjacent to industrial uses, per the California Building Standards Code. The following noise control measures may be required for dwelling units located near adjacent roadways and industrial uses:

- Install sound barriers between residences and noise sources.
- Install double-paned or similar sound rated windows.
- Provide sound insulating exterior walls and roofing systems.

- Locate and/or design attic vents to minimize sound propagation into each home.

- Provide forced-air ventilation systems.

- Place dwellings as far as practical from the noise source

DF-2 The project shall comply with California Title 24 building insulation requirements for exterior walls, roofs and common separating assemblies (e.g. floor/ceiling assemblies and demising walls).

DF-3 For proper acoustical performance, all exterior windows, doors, and sliding glass doors should have a positive seal and leaks/cracks must be kept to a minimum.

DF-4 The final building plans shall ensure that HVAC units are not located within an area of the project site that would contribute to a noise level exceedance at any adjacent property line, per the City of Ontario Municipal Code requirements. To meet the City's noise standards the following measures should be followed:

- All HVAC equipment shall be shielded or enclosed from the line of sight of adjacent residential uses.

7.0 Construction Noise and Vibration Impacts

Temporary construction noise and vibration impacts have been assessed from the project site to the nearest sensitive residential use to the north of Lot F and Lot G. The degree of construction noise will vary depending on the type of construction activity taking place and the location of the activity relative to the surrounding properties.

Chapter 29: Noise, Section 5-29.06 of the City's municipal code states that the following activities shall be exempted from the provisions of the noise code;

- Noise sources associated with construction, repair, remodeling, demolition or grading of any real property. Such activities shall instead be subject to the following provisions of § 5-29.09;

    i. No person, while engaged in construction, remodeling, digging, grading, demolition or any other related building activity, shall operate any tool, equipment or machine in a manner that produces loud noise that disturbs a person of normal sensitivity who works or resides in the vicinity, or a Police or Code Enforcement Officer, on any weekday except between the hours of 7:00 a.m. and 6:00 p.m. or on Saturday or Sunday between the hours of 9:00 a.m. and 6:00 p.m.

    ii. No landowner, construction company owner, contractor, subcontractor, or employer shall permit or allow any person or persons working under their direction and control to operate any tool, equipment or machine in violation of the provisions of this section.

To help further assess potential construction noise level impacts under CEQA, the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment (2006) criteria is used as a referenced threshold of significance in this report. The FTA provides reasonable criteria for assessing construction noise impacts based on the potential for adverse community reaction. For residential uses, the daytime noise threshold is 80 dBA Leq for an 8-hour period. In compliance with the City's Municipal Code, it is assumed construction would not occur during the noise-sensitive nighttime hours.

7.1 Typical Construction Noise Levels

Table 17 shows typical construction noise levels compiled by the Environmental Protection Agency (EPA) for common type construction equipment. Typical construction noise levels

are used to estimate potential project construction noise levels at the adjacent sensitive receptors.

Table 17
Typical Construction Noise Levels[1]

Type	Noise Levels (dBA) at 50 Feet
Earth Moving	
Compactors (Rollers)	73 - 76
Front Loaders	73 - 84
Backhoes	73 - 92
Tractors	75 - 95
Scrapers, Graders	78 - 92
Pavers	85 - 87
Trucks	81 - 94
Materials Handling	
Concrete Mixers	72 - 87
Concrete Pumps	81 - 83
Cranes (Movable)	72 - 86
Cranes (Derrick)	85 - 87
Stationary	
Pumps	68 - 71
Generators	71 - 83
Compressors	75 - 86
Impact Equipment	
Pneumatic Wrenches	82 - 87
Jack Hammers, Rock Drills	80 - 99
Pile Drivers (Peak)	95-105
Other	
Vibrators	68 - 82
Saws	71 - 82

[1] Referenced Noise Levels from the Environmental Protection Agency (EPA)

7.2 Construction Noise Impact Analysis

This assessment analyzes potential noise impacts during all expected phases of construction, including; demolition, site preparation, grading, building construction, paving, and architectural coating. Construction phasing and equipment usage assumptions are referenced from:

- Toyota Arena Mixed Use Development AQ & GHG Impact Study, by RK Engineering Group, June 2021.

The project's estimated construction noise levels have been calculated using the Federal Highway Administration Roadway Construction Noise Model Version 1.1. Tables 18 show the noise level impacts to the nearest residential property lines to the north at 160 feet. Construction noise calculation worksheets are provided in Appendix D.

Table 18
Project Construction Noise Levels – Residential Uses to the North

Phase	Equipment	Quantity	Equipment Noise Level at 160ft (dBA Leq)	Combined Noise Level (dBA Leq)
Demolition	Concrete/Industrial Saw	1	72.5	76.3
	Excavator	3	66.6	
	Rubber Tired Dozer	2	67.6	
Site Preparation	Rubber Tired Dozers	3	67.6	77.5
	Tractors/Loaders/Backhoes	4	69.9	
Grading	Excavators	2	66.6	78.1
	Graders	1	70.9	
	Rubber Tired Dozers	1	67.6	
	Scrappers	2	69.5	
	Tractors/Loaders/Backhoes	2	69.9	
Building Construction	Cranes	1	62.5	76.2
	Forklifts	3	60.9	
	Generator Sets	1	67.5	
	Tractors/Loaders/Backhoes	3	69.9	
	Welders	1	59.9	
Paving	Cement and Mortar Mixer	2	64.7	71.8
	Pavers	2	64.1	
	Paving Equipment	2	62.9	
Architectural Coating	Air Compressors	1	63.6	63.6
Worst Case Construction Phase Noise Level - Leq (dBA)				78.1
FTA Construction Noise Criteria (Detailed Assessment: 8-Hour Leq)				80.0
Noise level exceeds FTA criteria?				No

As shown in Table 18, project construction noise levels are expected to be below the recommended 8-hour construction noise threshold provided by the FTA for adverse community reaction at the adjacent residential uses.

7.3 Construction Vibration

To determine the vibratory impacts during construction, reference construction equipment vibration levels were utilized and then extrapolated to the façade of the nearest adjacent structures. The nearest sensitive receptors are the commercial/retail structures located adjacent to the project site. All structures surrounding the project site are "new structures". No historical or fragile buildings are known to be located within the vicinity of the site.

The construction of the proposed project is not expected to require the use of substantial vibration inducing equipment or activities, such as pile drivers or blasting. The main sources of vibration impacts during construction of the project would be the operation of equipment such as bulldozer activity during demolition, loading trucks during grading and excavation, and vibratory rollers during paving.

The construction vibration assessment utilizes the referenced vibration levels and methodology set-forth within the Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, September 2018.

Table 19 shows the referenced vibration levels.

Table 19
Typical Construction Vibration Levels[1]

Equipment	Peak Particle Velocity (PPV) (inches/second) at 25 feet	Approximate Vibration Level (LV) at 25 feet
Piledriver (impact)	1.518 (upper range)	112
	0.644 (typical)	104
Piledriver (sonic)	0.734 upper range	105
	0.170 typical	93
Clam shovel drop (slurry wall)	0.202	94
Hydromill	0.008 in soil	66
(slurry wall)	0.017 in rock	75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

[1] Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, September 2018

Table 20 shows the project's construction-related vibration analysis at the nearest structures to the project construction area. Construction impacts are assessed from the closest area on the project site to the nearest adjacent structure at approximately 50 feet. The worst case vibratory impact from the site is estimated to be 0.098 PPV (in/sec) at the structures to the west. No damage potential is expected.

Table 20
Construction Vibration Impact Analysis

Construction Activity	Distance to Nearest Structure (ft)	Duration	Calculated Vibration Level - PPV (in/sec)	Damage Potential Level	Annoyance Criteria Level
Large Bulldozer	50	Continuous/Frequent	0.042	No Impacts	Distinctly Perceptible
Vibratory Roller	50	Continuous/Frequent	0.035	No Impacts	Barely Perceptible
Loaded Trucks	50	Continuous/Frequent	0.098	Extremely Fragile Buildings, Ruins Ancient Monuments	Distinctly Perceptible
Caisson Drilling	50	Continuous/Frequent	0.042	No Impacts	Distinctly Perceptible

As shown in Table 20, project related construction activity is not expected to cause any potential damage to the nearest structures. The annoyance potential of vibration from construction activities would range from "distinctly perceptible" to "Barely perceptible".

Construction vibration calculation worksheets are shown in Appendix D.

7.4 Recommended Construction Design Features

The following recommended project design features include standard rules and requirements, best practices and recognized design guidelines for reducing noise levels. Design features are assumed to be part of the conditions of the project and integrated into its design. Design features are not typically considered mitigation under CEQA

DF-7 Prepare a construction management plan and obtain a construction work permit from the City of Ontario prior to starting construction. The construction management plan shall ensure all contractors implement construction best management practices to reduce construction noise levels. Best management practices shall include the following:

- All construction equipment shall be equipped with muffles and other suitable noise attenuation devices (e.g., engine shields).
- Grading and construction contractors shall use quieter equipment as opposed to noisier equipment (such as rubber-tired equipment rather than track equipment), to the maximum extent feasible.
- If feasible, electric hook-ups shall be provided to avoid the use of generators. If electric service is determined to be infeasible for the site, only whisper-quiet generators shall be used (i.e., inverter generators capable of providing variable load.
- Use electric air compressors and similar power tools rather than diesel equipment, where feasible.
- Locate staging area, generators and stationary construction equipment as far from the adjacent residential homes as feasible.
- Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 5 minutes.

- Provide notifications and signage in readily visible locations along the perimeter of construction sites that indicate the dates and duration of construction activities, as well as provide a telephone number where neighbors can enquire about the construction process and register complaints to a designated construction noise disturbance coordinator.

- Construction activities shall not take place between the hours of 6:00 p.m. and 7:00 a.m. on weekdays and Saturday or Sunday between the hours of 9:00 a.m. and 6:00 p.m.

DF-8 No impact pile driving or blasting activities shall be permitted on the project site during construction. If impact pile driving or blasting is required, a follow-up noise and vibration impact assessment shall be conducted prior to start of any activity.

Exhibits

Exhibit A

Location Map

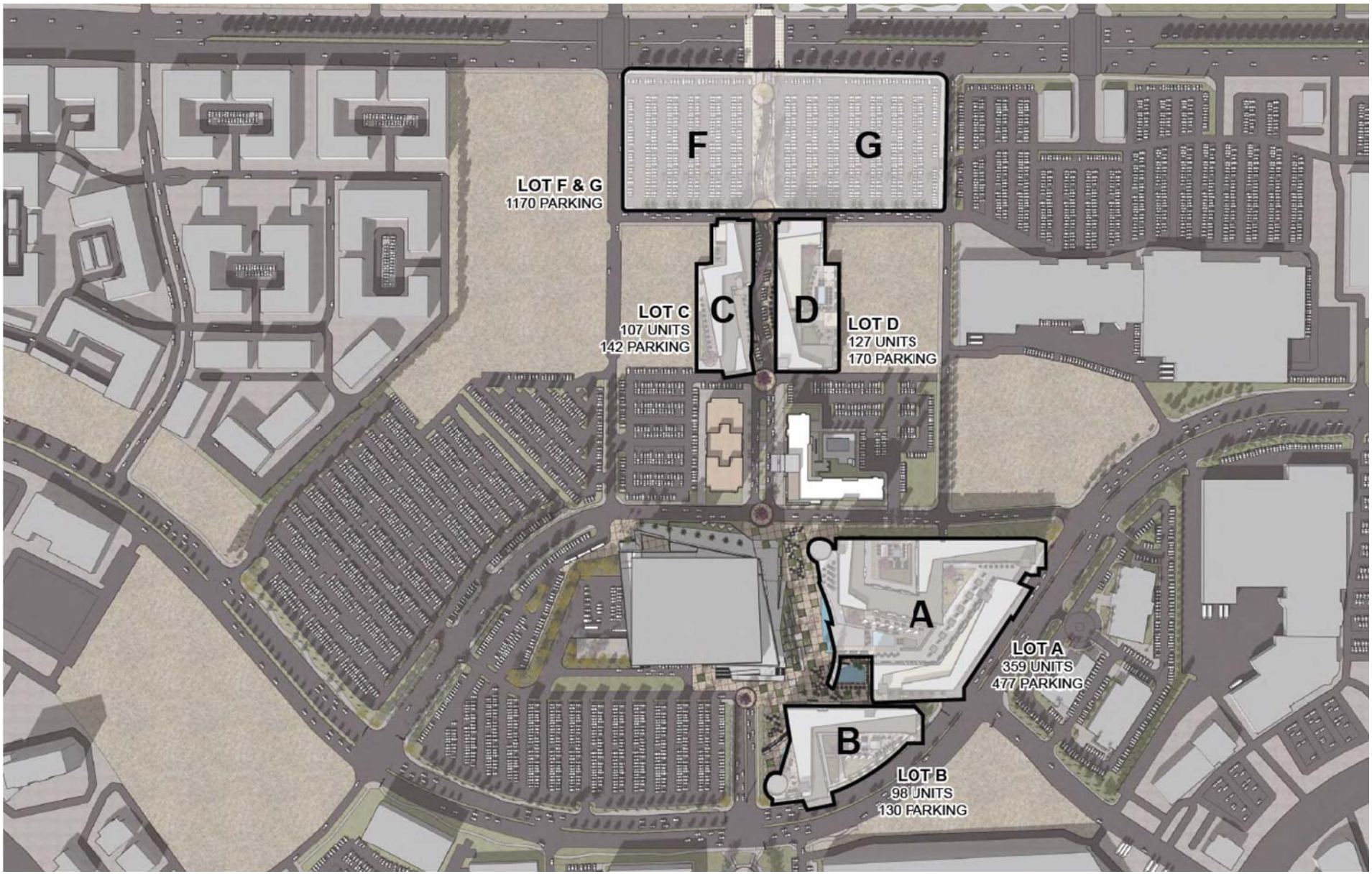
Legend:

① = Receptor Location

N

Exhibit C

Noise Monitoring Locations



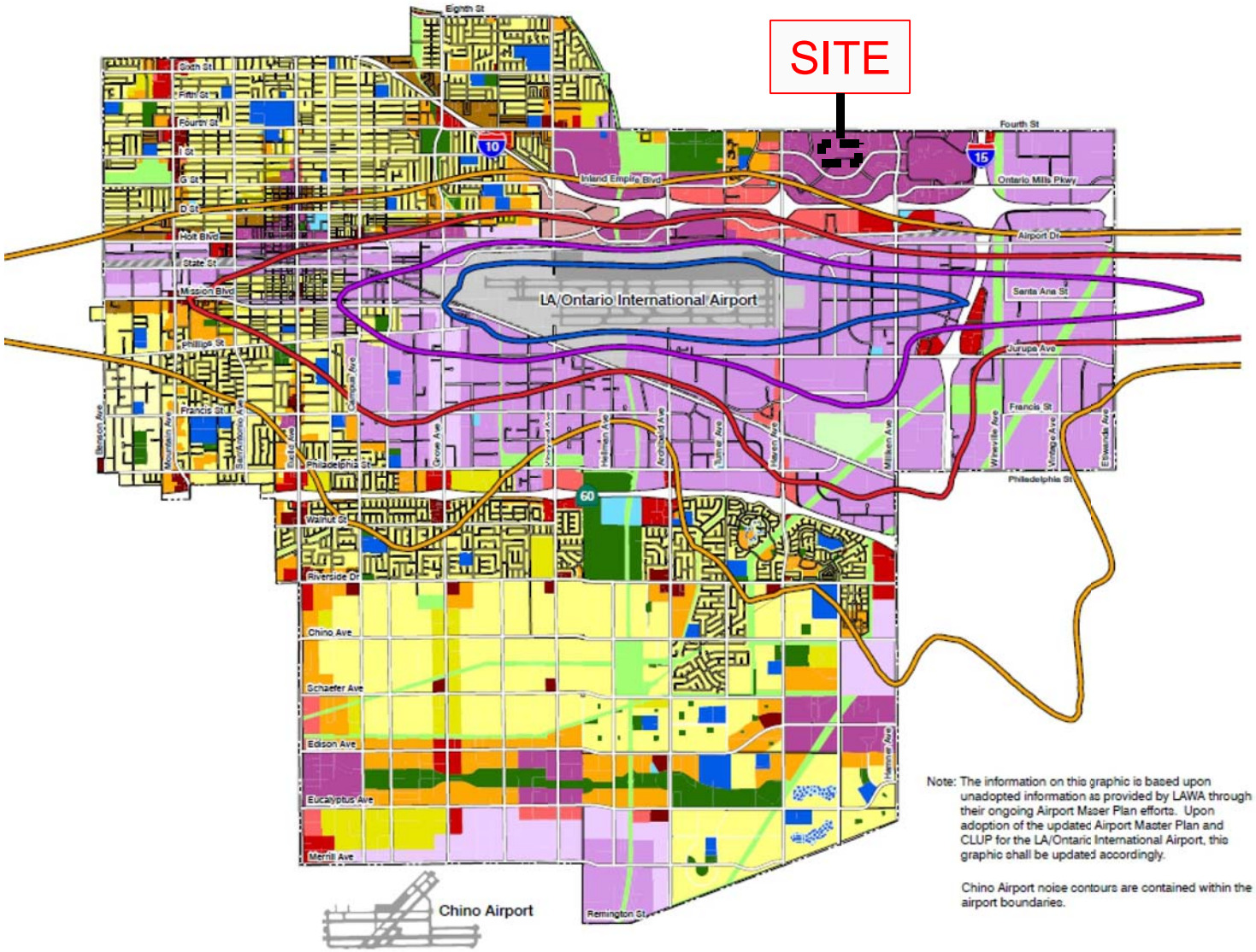
Noise Monitoring Locations

Legend:

LT-1 = Long Term (24-Hr) Noise Monitoring Location

Exhibit D

LAONT Airport Noise Contours



Note: The information on this graphic is based upon unadopted information as provided by LAWA through their ongoing Airport Maser Plan efforts. Upon adoption of the updated Airport Master Plan and CLUP for the LA/Ontario International Airport, this graphic shall be updated accordingly.

Chino Airport noise contours are contained within the airport boundaries.

Airport Noise Contours

LA/Ontario International Airport (2030)

- 60 dB CNEL
- 65 dB CNEL
- 70 dB CNEL
- 75 dB CNEL

Residential
- Rural (0 - 2 du/ac)
- Low Density (2.1 - 5 du/ac)
- Low-Medium Density (5.1 - 11 du/ac)
- Medium Density (11.1 - 25 du/ac)
- High Density (25.1 - 45 du/ac)

Mixed Use
- Mixed Use

Retail/Service
- Neighborhood Commercial (.4 FAR)
- General Commercial (.4 FAR)
- Office/Commercial (1.0 FAR)
- Hospitality (1.0 FAR)

Employment
- Business Park (.6 FAR)
- Industrial (.55 FAR)

Other
- Open Space - Non-Recreation
- Open Space - Parkland
- Open Space - Water
- Public Facility
- Public School
- LA/Ontario International Airport
- Railroad
- Landfill

0 Miles 1

Appendices

Appendix A

City of Ontario
Noise Standards

CHAPTER 29: NOISE

5-29.01 Declaration of findings and policy

5-29.02 Definitions

5-29.03 Designated noise zones

5-29.04 Exterior noise standards

5-29.05 Interior noise standards

5-29.06 Exemptions

5-29.07 Loud and disturbing noise

5-29.08 Real property maintenance noise regulations

5-29.09 Construction activity noise regulations

5-29.10 Other public agency exceptions

5-29.11 Schools, day care centers, churches, libraries, museums, health care institutions; Special provisions

5-29.12 Sound amplifying equipment

5-29.13 Amplified sound

5-29.14 Motor vehicles

5-29.15 Noise level measurement

5-29.16 Prima facie violation

5-29.17 Penalty

5-29.18 Enforcement and administration

5-29.19 City Manager waiver

5-29.20 Noise abatement program

Sec. 5-29.01. Declaration of findings and policy.

It is hereby found and declared that:

(a) The making and creation of excessive, unnecessary or unusually loud noises within the limits of the City is a condition that has existed for some time, however, the extent and volume of such noises is increasing;

(b) The making, creation or maintenance of such excessive, unnecessary, unnatural or unusually loud noises that are prolonged, unusual and unnatural in their time, place and use affect and are a detriment to public health, comfort, convenience, safety, welfare and prosperity of the residents of the City; and

(c) The necessity in the public interest for the provisions and prohibitions hereinafter contained and enacted, is declared as a matter of legislative determination and public policy, and it is further declared

that the provisions and prohibitions hereinafter contained and enacted are in pursuance of and for the purpose of securing and promoting the public health, comfort, convenience, safety, welfare and prosperity and the peace and quiet of the residents of the City.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.02. Definitions.

As used in this chapter, specific words and phrases are defined as follows:

(a) "Ambient noise level" shall mean the all-encompassing noise level associated with a given environment and is a composite of sounds from all sources, excluding the alleged offensive noise or excessive sound, at the location and approximate time at which a comparison with the alleged offensive noise is to be made.

(b) "Applicable (noise) zone" shall mean the noise zone category based on the actual use of the property, provided that the actual use is a legal use in the City.

(c) "A-weighted sound level" shall mean the sound pressure level in decibels (dBAs) as measured with a sound level meter using the A-weighted filter network (scale) at slow response and at a pressure of twenty (20) micropascals. The A-weighted filter de-emphasizes the very low and a very high frequency component of sound in a manner similar to the response of the human ear, and is a numerical method of rating human judgment of loudness.

(d) "Decibel (dBA)" shall mean a unit for measuring the amplitude of a sound, equal to twenty (20) times the logarithm to the base ten (10) of the ratio of pressure of the sound measured to the reference pressure of twenty (20) micropascals.

(e) "Equivalent sound or noise level (Leq)" shall mean the International Electrotechnical Commission (IEC) 60804 Standard for measurement, or the most recent revision thereof, for the sound level corresponding to a steady state noise level over a given sample period with the same amount of acoustic energy as the actual time varying noise level or the energy average noise level during the sample period. The measurement period for the purposes of this chapter is fifteen (15) minutes.

(f) "Impulsive noise" shall mean a noise of short duration usually less than one (1) second and of high intensity, with an abrupt onset and rapid decay. Such objectionable noises may also be repetitive.

(g) "Intrusive noise" shall mean that noise that intrudes over and above the ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence and tonal information content, as well as the prevailing ambient noise level.

(h) "Maintenance" shall mean the upkeep, repair or preservation of existing property or structures.

(i) "Noise" shall mean any unwanted sound or sound that is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing or is otherwise annoying.

(j) "Noise level (sound level)" shall mean the weighted sound pressure level obtained by use of a sound level meter having a standard frequency filter for attenuating part of the sound spectrum. For purposes of this chapter, all noise levels (sound levels) shall be A-weighted sound pressure level.

(k) "Noise (sound) level meter" shall mean an instrument, including a microphone, an amplifier, an output meter and frequency weighting networks for the measurement and determination of noise and sound levels. For the purposes of this chapter, the sound level meter must meet the International Electrotechnical Commission (IEC) 60651 and 60804 Standards, or the most recent revisions thereof, for Type 1 sound level meters or an instrument and the associated recording and analyzing equipment that will provide equivalent data.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.03. Designated noise zones.

The properties hereinafter described shall be assigned to the following noise zones:

Noise Zone I:	All single-family residential properties;
Noise Zone II:	All multi-family residential properties and mobile home parks;
Noise Zone III:	All commercial property;
Noise Zone IV:	The residential portion of mixed use properties;
Noise Zone V:	All manufacturing or industrial properties and all other uses.

The actual use of the property, and not necessarily its zoning designation, shall be the determining factor in establishing whether a property is in Noise Zone I, II, III, IV or V, provided that the actual use is a legal use within the applicable zone.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.04. Exterior noise standards.

(a) The following exterior noise standards, unless otherwise specifically indicated, shall apply to all properties within a designated noise zone.

Allowable Exterior Noise Level (1)		***Allowed Equivalent Noise Level, Leq. (2)***	
Noise Zone	***Type of Land Use***	***7 a.m. to 10 p.m.***	***10 p.m. to 7 a.m.***
I	Single-Family Residential	65 dBA	45 dBA
II	Multi-Family Residential, Mobile Home Parks	65 dBA	50 dBA
III	Commercial Property	65 dBA	60 dBA
IV	Residential Portion of Mixed Use	70 dBA	70 dBA
V	Manufacturing and Industrial, Other Uses	70 dBA	70 dBA

(1) If the ambient noise level exceeds the resulting standard, the ambient noise level shall be the standard.

(2) Measurements for compliance are made on the affected property pursuant to § 5-29.15.

(b) It is unlawful for any person at any location within the incorporated area of the City to create noise, or to allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which noise causes the noise level, when measured at any location on any other property, to exceed either of the following:

(1) The noise standard for the applicable zone for any fifteen-minute (15) period; and

(2) A maximum instantaneous (single instance) noise level equal to the value of the noise standard plus twenty (20) dBA for any period of time (measured using A-weighted slow response).

(c) In the event the ambient noise level exceeds the noise standard, the maximum allowable noise level under such category shall be increased to reflect the maximum ambient noise level.

(d) The Noise Zone IV standard shall apply to that portion of residential property falling within one hundred (100) feet of a commercial property or use, if the noise originates from that commercial property or use.

(e) If the measurement location is on a boundary between two (2) different noise zones, the lower noise level standard applicable to the noise zone shall apply.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.05. Interior noise standards.

(a) The following interior noise standards, unless otherwise specifically indicated, shall apply to all properties within a designated noise zone.

Allowable Interior Noise Level (1)		**Allowed Equivalent Noise Level, Leq.** (2)	
Noise Zone	***Type of Land Use***	***7 a.m. to 10 p.m.***	***10 p.m. to 7 a.m.***
I	Single-Family Residential	45 dBA	40 dBA
II	Multi-Family Residential, Mobile Home Parks	45 dBA	40 dBA
IV	Residential Portion of Mixed Use	45 dBA	40 dBA

(1) If the ambient noise level exceeds the resulting standard, the ambient noise level shall be the standard.

(2) Measurements for compliance are made on the affected property pursuant to § 5-29.15.

(b) It is unlawful for any person at any location within the incorporated area of the City to create noise, or to allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which noise causes the noise level, when measured at any location on any other property, to exceed either of the following:

(1) The noise standard for the applicable zone for any fifteen-minute (15) period;

(2) A maximum instantaneous (single instance) noise level equal to the value of the noise standard plus twenty (20) dBA for any period of time (measured using A-weighted slow response).

(c) In the event the ambient noise level exceeds the noise standard, the maximum allowable noise level under such category shall be increased to reflect the maximum ambient noise level.

(d) The Noise Zone IV standard shall apply to that portion of residential property falling within one hundred (100) feet of a commercial property or use, if the noise originates from that commercial property or use.

(e) If the measurement location is on a boundary between two (2) different noise zones, the lower noise level standard applicable to the noise zone shall apply.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.06. Exemptions.

The following activities shall be exempted from the provisions of this chapter:

(a) Any activity conducted on public property, or on private property with the consent of the owner, by any public entity or its officers, employees, representatives, agents, subcontractors, permittees, licensees or lessees that the public entity has authorized are exempt from the provisions of this chapter. This includes, without limitation, sporting and recreational activities that are sponsored, co-sponsored, permitted or allowed by the City or any school district within the City's jurisdictional boundaries. This also includes, without limitation, occasional outdoor gatherings, public dances, shows or sporting and entertainment events, provided such events are conducted pursuant to an approval, authorization, contract, lease, permit or sublease by the appropriate public entity, specifically the planning commission or City Council;

(b) Occasional outdoor gatherings, public dances, show, sporting and entertainment events, provided said events are conducted pursuant to a permit or license issued by the appropriate jurisdiction relative to the staging of said events;

(c) Any mechanical device, apparatus or equipment used, related to or connected with emergency machinery, vehicle, work or warning alarm or bell, provided the sounding of any bell or alarm on any building or motor vehicle shall terminate its operation within forty-five (45) minutes in any hour of its being activated;

(d) Noise sources associated with construction, repair, remodeling, demolition or grading of any real property. Such activities shall instead be subject to the provisions of § 5-29.09;

(e) Noise sources associated with construction, repair, remodeling, demolition or grading of public rights-of-way or during authorized seismic surveys;

(f) All mechanical devices, apparatus or equipment associated with agriculture operations provided that:

(1) Operations do not take place between 8:00 p.m. and 7:00 a.m.;

(2) Such operations and equipment are utilized for the protection or salvage of agricultural crops during periods of potential or actual frost damage or other adverse weather conditions; or

(3) Such operations and equipment are associated with agricultural pest control through pesticide application, provided the application is made in accordance with permits issued by or regulations enforced by the California Department of Agriculture;

(g) Noise sources associated with the maintenance of real property. Such activities shall instead be subject to the provisions of § 5-29.08;

(h) Any activity to the extent regulation thereof has been preempted by state or federal law;

(i) Any noise sources associated with people and/or music associated with a party at a residential property. Such noise shall be subject to the provisions of OMC § 5-29.07;

(j) Any noise source emanating from an ice cream truck within the City. Such noise shall be subject to the provisions of OMC § 4-18.04;

(k) Any noise sources associated with barking dogs or other intermittent noises made by animals on any properly within the City. Such noise shall be subject to the provisions of OMC Chapter 1, Title 6;

(l) Noise sources related to uses approved by a permit or development agreement adopted prior to the date of adoption of this chapter and that contains acoustic or noise standard conditions of approval. This exemption shall only be applicable during the effective period of the City-approved permit or development agreement.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.07. Loud and disturbing noise.

(a) It is unlawful for any person or property owner within the City to make, cause or allow to be made any loud, excessive, impulsive or intrusive noise, disturbance or commotion that disturbs the peace or quiet of any area or that causes discomfort or annoyance to any reasonable person of normal sensitivities in the area, after a Police or Code Enforcement Officer has first requested that the person or property owner cease and desist from making such noise. The types of loud, disturbing, excessive, impulsive or intrusive noise may include, but shall not be limited to, yelling, shouting, hooting, whistling, singing, playing a musical instrument, or emitting or transmitting any loud music or noise from any mechanical or electrical sound making or sound-amplifying device.

(b) The factors, standards, and conditions that may be considered in determining whether a violation of the provisions of this section has been committed, included, but not limited to, the following:

(1) The level of the noise;

(2) The level and intensity of the background (ambient) noise, if any;

(3) The proximity of the noise to residential or commercial sleeping areas;

(4) The nature and zoning of the area within which the noise emanates;

(5) The density of inhabitation of the area within which the noise emanates;

(6) The time of day and night the noise occurs;

(7) The duration of the noise;

(8) Whether the noise is constant, recurrent or intermittent;

(9) Whether the noise is produced by a commercial or noncommercial activity; and

(10) Whether the use is lawful under the provisions of Title 5 of this Code and whether the noise is one that could reasonably be expected from the activity or allowed use.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.08. Real property maintenance noise regulations.

(a) No person, while engaged in maintenance of real property, shall operate any tool, equipment or machine in a manner that produces loud noise that disturbs a person of normal sensitivity who works or resides in the vicinity, or a Police or Code Enforcement Officer, except between the hours of 8:00 a.m. and 6:00 p.m.

(b) Trimming or pruning that requires the use of chainsaws or mulching machines shall only be allowed between the hours of 8:00 a.m. and 6:00 p.m. on a weekday and between the hours of 9:00 a.m. and 5:00 p.m. on Saturday or Sunday.

(c) The use of electrical or gasoline powered blowers, such as commonly used by gardeners or other persons for cleaning lawns, yards, driveways, gutters and other property shall only be allowed between the hours of 8:00 a.m. and 6:00 p.m. on a weekday and between the hours of 9:00 a.m. and 5:00 p.m. on Saturday or Sunday.

(d) No landowner, gardener, property maintenance service, contractor, subcontractor or employer shall permit or allow any person or persons working under his or her direction or control to operate any tool, equipment or machine in violation of the provisions of this section.

(e) Exceptions. The provisions of this section shall not apply to the following:

(1) Emergency property maintenance required by the building official;

(2) The maintenance, repair or improvement of any public work or facility by public employees, by any person or persons acting pursuant to a public works contract, or by any person or persons performing such work or pursuant to the direction of, or on behalf of, any public agency; provided, however, this exception shall not apply to the City, or its employees, contractors or agents, unless:

(i) The City Manager or department head determines that the maintenance, repair or improvement is immediately necessary to maintain public service,

(ii) The maintenance, repair or improvement is of a nature that cannot feasibly be conducted during normal business hours, or

(iii) The City Council has approved project specifications, contract provisions, or an environmental document that specifically authorizes maintenance during hours of the day that would otherwise be prohibited pursuant to this section; and

(3) Any maintenance that complies with the noise limits specified in § 5-29.04.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.09. Construction activity noise regulations.

(a) No person, while engaged in construction, remodeling, digging, grading, demolition or any other related building activity, shall operate any tool, equipment or machine in a manner that produces loud noise that disturbs a person of normal sensitivity who works or resides in the vicinity, or a Police or Code Enforcement Officer, on any weekday except between the hours of 7:00 a.m. and 6:00 p.m. or on Saturday or Sunday between the hours of 9:00 a.m. and 6:00 p.m.

(b) No landowner, construction company owner, contractor, subcontractor, or employer shall permit or allow any person or persons working under their direction and control to operate any tool, equipment or machine in violation of the provisions of this section.

(c) Exceptions.

(1) The provisions of this section shall not apply to emergency construction work performed by a private party when authorized by the City Manager or his or her designee;

(2) The maintenance, repair or improvement of any public work or facility by public employees, by any person or persons acting pursuant to a public works contract, or by any person or persons performing such work or pursuant to the direction of, or on behalf of, any public agency; provided, however, this exception shall not apply to the City, or its employees, contractors or agents, unless:

(i) The City Manager or a department head determines that the maintenance, repair or improvement is immediately necessary to maintain public services,

(ii) The maintenance, repair or improvement is of a nature that cannot feasibly be conducted during normal business hours, or

(iii) The City Council has approved project specifications, contract provisions, or an environmental document that specifically authorizes construction during hours of the day that would otherwise be prohibited pursuant to this section; and

(3) Any construction that complies with the noise limits specified in §§ 5-29.04 or 5-29.05.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.10. Other public agency exceptions.

The provisions of this chapter shall not be construed to prohibit any work at different hours by or under the direction of any other public agency or public or private utility companies in cases of necessity or emergency.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.11. Schools, day care centers, churches, libraries, museums, health care institutions; Special provisions.

It is unlawful for any person to create any noise that causes the outdoor noise level at any school, day care center, hospital or similar health care institution, church, library or museum while the same is in use, to exceed the noise standards specified in § 5-29.04 prescribed for the assigned Noise Zone I.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.12. Sound amplifying equipment.

Loudspeakers, sound amplifiers, public address systems or similar devices used to amplify sounds shall be subject to the provisions of § 5-29.13. Such sound amplifying equipment shall not be construed to include electronic devices, including but not limited to, radios, tape players, tape recorders, compact disc players, MP3 players, electric keyboards, music synthesizers, record players or televisions, which are designed and operated for personal use, or used entirely within a building and are not designed or used to convey the human voice, music or any other sound to an audience outside such building, or which are used in vehicles and heard only by occupants of the vehicle in which installed.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.13. Amplified sound.

(a) The City Council enacts the following legislation for the sole purpose of securing and promoting the public health, comfort, safety and welfare for its citizenry. While recognizing that the use of sound amplifying equipment may be entitled to certain protection by the constitutional rights of freedom of speech and assembly, the City Council finds that in order to protect the public safety and the correlative rights of the citizens of this community to privacy and freedom from public nuisance of loud and unnecessary noise, reasonable regulation of the time, place and manner of the use of amplifying equipment is necessary. In no event shall approval or authorization required herein be withheld by reason of the constitutionally protected content of any material proposed to be broadcast through amplifying equipment.

(b) It is unlawful for any person, other than personnel of law enforcement or governmental agencies, to install, use or operate a loudspeaker or sound amplifying device in a fixed or movable position or mounted upon any vehicle within the City for the purpose of giving instructions, directions, talks, addresses or lectures to any persons or assemblages of persons in or upon any street, alley, sidewalk, park, place or public property without a permit to do so from the Police Chief or his or her designee. Notwithstanding any other provision of this chapter, the provisions of this section shall also apply to the use of sound amplifying equipment upon public or private property when used in connection with outdoor or indoor public or private events, whether or not admission is charged or food or beverages are sold, when such activity is to be attended by more than one hundred (100) persons and the noise emanating from the event will be audible at the property plane, or in the case of a street dance or concert on the nearest residential property. Those activities listed in § 5-29.06(a) are exempt from the requirements of this section.

(c) The Police Chief or his or her designee is authorized to approve and issue permits under this section.

(d) An application for a permit required by this section shall be filed with the Police Chief at least sixteen (16) days and no more than one hundred twenty (120) days prior to the date on which the sound amplifying equipment is intended to be used. Applications for events covered by the First Amendment of the United States Constitution are exempt from the time requirements of this section if it is shown that circumstances require a shorter filing period and the event will not constitute an unsafe condition. The application shall contain the following information:

(1) The name, address and telephone number of both the owner and the user of the sound amplifying equipment;

(2) The license number, if a sound truck is to be used;

(3) A general description of the sound amplifying equipment which is to be used;

(4) Whether sound amplifying equipment will be used for commercial or noncommercial purpose;

(5) The dates and times upon and within which, and the streets or property over or upon which, the equipment is proposed to be operated;

(6) The name or names of one (1) or more persons who will be present during the conduct of any activities for which registration is sought and who will have authority to reduce the volume of any sound amplifying equipment during the course of the activities if required pursuant to this chapter and, otherwise, to insure compliance with the provisions of this chapter;

(7) A statement by the applicant that he or she is willing and able to comply with the provisions of this chapter and the conditions of the permit; and

(8) A sketch of the area or facilities within which the activities are to be conducted, with approximate dimensions and illustration of the location and orientation of all sound-amplifying equipment.

(e) The Police Chief shall deny the permit application or revoke any permit if the chief finds any of the following:

(1) The application contains materially false or intentionally misleading information;

(2) The use of sound amplifying equipment at an event or activity proposed will be located in or upon a premises, building or structure that is hazardous to the health or safety of the employees or patrons of the premises, business, activity, or event, or the general public, under the standards established by the Uniform Building or Fire Codes, or other applicable codes, as set forth in OMC Titles 4 and 8;

(3) The use of sound amplifying equipment at an event or activity proposed in or upon a premises, building or structure that lacks adequate on-site parking for participants attending the proposed event or activity under the applicable standards set forth in OMC Title 9;

(4) The conditions of any motor vehicle movement are such that, in his or her opinion, the use of the equipment would constitute an unreasonable interference with traffic safety;

(5) The conditions of pedestrian movement are such that the use of the equipment would constitute a detriment to traffic safety;

(6) The application submitted by the applicant reveals that the applicant would violate the provisions of this section or any other provision of federal, state and/or local law;

(7) The applicant is unwilling or unable to comply with the provisions of this chapter or any conditions imposed upon any permit issued;

(8) There had already been a permitted event at the intended location, or within a two hundred (200) yard radius of the intended location and the prior permitted event was located on residentially zoned property or on a street, alley, public parking lot or neighborhood park within three (3) months prior to the intended event. Community parks are exempt from this subsection (8); or

(9) The applicant or location has had previous violations within the past calendar year, and in the judgment of the Police Chief, issuance would be contrary to the intent of this section.

(f) In determining whether the use of the equipment would constitute an unreasonable interference with or detriment to traffic safety, the Police Chief shall consider, but shall not necessarily be limited to:

(1) The volumes, patterns and speed of vehicular and pedestrian traffic in the proposed area of use;

(2) The relationship of the proposed use of equipment and potential impacts upon traffic patterns;

(3) Availability of sufficient room for the operation of the equipment without significantly interfering with the traffic patterns;

(4) Proximity to schools, playgrounds and similar facilities where use of such equipment might attract children into traffic patterns; or

(5) Proximity to busy intersections or other potentially hazardous conditions where use of such equipment might constitute a hazard by reason of its tendency to distract drivers of vehicles or pedestrians.

(g) Issuance or denial.

(1) If the application is approved, the Police Chief shall return an approved copy of the application to the applicant and shall issue a permit. The permit shall constitute permission for the use of the sound amplifying equipment as requested.

(2) Any application filed shall be either approved or disapproved within five (5) days of the filing thereof.

(3) If the application is disapproved, the Police Chief shall return a disapproved copy forthwith to the applicant with a written statement on the reason for disapproval.

(i) Any person aggrieved by a decision of the Police Chief or his or her designee may file an appeal to the City Manager. A complete and proper appeal shall be filed with the City Clerk within ten (10) calendar days of the action that is the subject of the appeal. If the applicant fails to file an appeal within the ten (10) day filing period provided herein, denial shall take effect immediately upon expiration of such filing period. All appeals shall be in writing and shall contain the following information: (a) name(s) of the person filing the appeal, (b) a brief statement in ordinary and concise language of the relief sought, and (c) the signatures of all parties named as appellants and their mailing addresses. After receiving the appeal, the City Clerk shall immediately forward the matter to the City Manager for handling.

(ii) The City Manager shall, upon receipt of the appeal, set the matter for hearing before the City Manager or a hearing officer. Any hearing officer shall be a licensed attorney or recognized mediator designated by the City Manager. The hearing shall be set for not more than ten (10) calendar days after the receipt of the appeal unless a longer time is requested or consented to by the appellant. Notice of such hearing shall be given in writing and mailed at least five (5) calendar days prior to the date of the hearing, by U.S. mail, with a proof of service attached, addressed to the address listed on the permit application, or the written appeal if different from the permit application. The notice shall state the grounds of the complaint or reason for the denial and shall state the time and place where such hearing will be held.

(iii) The City Manager or hearing officer shall, within ten (10) calendar days following the conclusion of the hearing, make a written finding and decision, which shall be delivered to the City and the appellant by first class mail. Notwithstanding any provision in this Code, the decision of the City Manager or hearing officer shall be the final administrative decision of the City. Any party dissatisfied with the decision of the City Manager or hearing officer may seek review of such decision under the provisions of Code Civil Procedure, §§ 1094.5 and 1094.8, as amended from time to time.

(h) In addition to any other provisions of this Code, the use of sound-amplifying equipment and sound trucks in the City shall be subject to the following regulations:

(1) The only sounds permitted are music and human speech;

(2) Sound shall not be emitted within one hundred (100) yards of hospitals, churches, schools and City Hall;

(3) The volume of sound shall be controlled so that it will not be audible for a distance in excess of one hundred (100) feet from the sound amplifying equipment or sound truck, and so that the volume is not unreasonably loud, raucous, jarring, disturbing or a nuisance to persons within the range of allowed audibility; or

(4) The sound amplifying equipment or sound truck shall not be used between the hours of 8:00 p.m. and 8:00 a.m.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.14. Motor vehicles.

The use of any motor vehicle in such a condition as to create excessive, impulsive or intrusive noises is prohibited. The discharge into the open air of the exhaust of any internal combustion engine, stationary or mounted on wheels, motorboat or motor vehicle, including motor cycle, whether or not discharged through a muffler or other similar device, which discharge creates excessive, unusual, impulsive or intrusive noise is prohibited. Motor vehicles shall comply with the noise regulations of the California Vehicle Code.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.15. Noise level measurement.

(a) The location selected for measuring exterior noise levels in a residential area shall be at any part of a private yard, patio, deck or balcony normally used for human activity and identified by the owner or, if occupied by someone other than the owner, the occupant of the affected property as suspected of exceeding the noise level standard. This location may be the closest point in the private yard or patio, or on the deck or balcony, to the noise source, but should not be located in nonhuman activity areas such as trash container storage areas, planter beds, above or contacting a property line fence, or other areas not normally used as part of the yard, patio, deck or balcony. The location selected for measuring exterior noise levels in a nonresidential area shall be at the closest point to the noise source. The measurement microphone height shall be five (5) feet above finish elevation or, in the case of a deck or balcony, the measurement microphone height shall be five (5) feet above the finished floor level.

(b) The location selected for measuring interior noise levels shall be made within the affected residential unit. The measurements shall be made at a point at least four (4) feet from the wall, ceiling or floor, or within the frame of a window opening, nearest the noise source. The measurements shall be made with windows in an open position.

(c) Any decibel measurement made pursuant to the provisions of this chapter shall be measured in decibels (dBAs) as measured with a sound level meter using the A-weighted sound pressure level.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.16. Prima facie violation.

Any noise exceeding the noise level standard as specified in §§ 5-29.04 and 5-29.05, shall be deemed to be prima facie evidence of a violation of the provisions of this chapter.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.17. Penalty.

(a) Any person who negligently or knowingly violates any provision of this chapter shall be guilty of an infraction and upon conviction shall be punishable by a fine specified in OMC § 1-2.01. Each day a violation occurs shall constitute a separate offense and shall be punishable as such.

(b) Any person who negligently or knowingly violates any provision of this chapter may also be subject to fine(s) specified in the administrative citation schedule of fines set forth in OMC § 1-5.04. The manner of issuing administrative citations shall comply with all the procedures specified in OMC Chapter 5, Title 1.

(c) As an additional remedy, the operation or maintenance of any device, instrument, vehicle or machinery in violation of any provisions of this chapter, which operation or maintenance causes or creates sound levels exceeding the allowable standards as specified in this chapter, shall be deemed and is declared to be a public nuisance and may be subject to abatement by a restraining order or injunction issued by a court of competent jurisdiction.

(d) Any violation of this chapter is declared to be a public nuisance and may be abated in accordance with law. The expense of enforcing this chapter is declared to be public nuisance and may be by resolution of the City Council declared to be a lien and special assessment against the property on which such nuisance is maintained, and any such charge shall also be a personal obligation of the property owner.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.18. Enforcement and administration.

(a) It shall be the responsibility of Police or Code Enforcement Officers to enforce the provisions of this chapter and to perform all other functions required by this chapter. Such duties shall include, but not be limited to investigating potential violations, issuing warning notices and citations, and providing evidence to the City prosecutor for legal action.

(b) For violations of § 5-29.07, Police or Code Enforcement Officers shall obtain a declaration under penalty of perjury from two (2) declarants living in separate households within a sixty (60) day period stating in detail all of the following:

(1) That the declarant is a resident of a residential neighborhood located within two hundred (200) yards of the noise source; and

(2) Within the past month declarant has heard noise for substantially long periods to the extreme annoyance of the declarant.

(3) Declarations from two (2) declarants are required to prove a violation of § 5-29.07, but are not required to prove that a person has violated any other provision of this chapter.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.19. City Manager waiver.

The City Manager is authorized to grant a temporary waiver to the provisions of this chapter for a period of time necessary to correct the violations of this chapter, if such temporary waiver would be in the public interest and there is no feasible and prudent alternative to the activity, or the method of conducting the activity, for which the temporary waiver is sought. This time period may include a commitment to a program that includes placing necessary orders and entering into necessary contracts within thirty (30) days for repair or installation.

(§ 2, Ord. 2888, eff. March 6, 2008)

Sec. 5-29.20. Noise abatement program.

(a) In circumstances where adopted community-wide noise standards and policies prove impractical in controlling noise generated from a specific source, the City Council may establish a noise abatement program that recognizes the characteristics of the noise source and affected property and that incorporates specialized mitigation measures.

(b) Noise abatement programs shall set forth in detail the approved terms, conditions and requirements for achieving maximum compliance with noise standards and policies. Said terms, conditions and requirements may include, but shall not be limited to, limitations, restrictions, or prohibitions on operating hours, location of operations, and the types of equipment.

(§ 2, Ord. 2888, eff. March 6, 2008)

NOISE LEVEL EXPOSURE AND LAND USE COMPATIBILITY GUIDELINES

Table LU-7

LAND USE CATEGORIES		COMMUNITY NOISE EQUIVALENT LEVEL (CNEL)						
Category	Land Use	55	60	65	70	75	80	
Residential/ Lodging	Single Family / Duplex							
	Multi-Family							
	Mobile Homes							
	Hotel/Motels							
Public/Institutional	Schools/Hospitals							
	Churches/ Libraries							
	Auditoriums/Concert Halls							
Commercial	Offices							
	Retail							
Industrial	Manufacturing							
	Warehousing							
Recreational/ Open Space	Parks/Playgrounds							
	Golf Courses/ Riding Stables							
	Outdoor Spectator Sports							
	Outdoor Music Shells/ Amphitheaters							
	Livestock/Wildlife Preserves							
	Crop Agriculture							

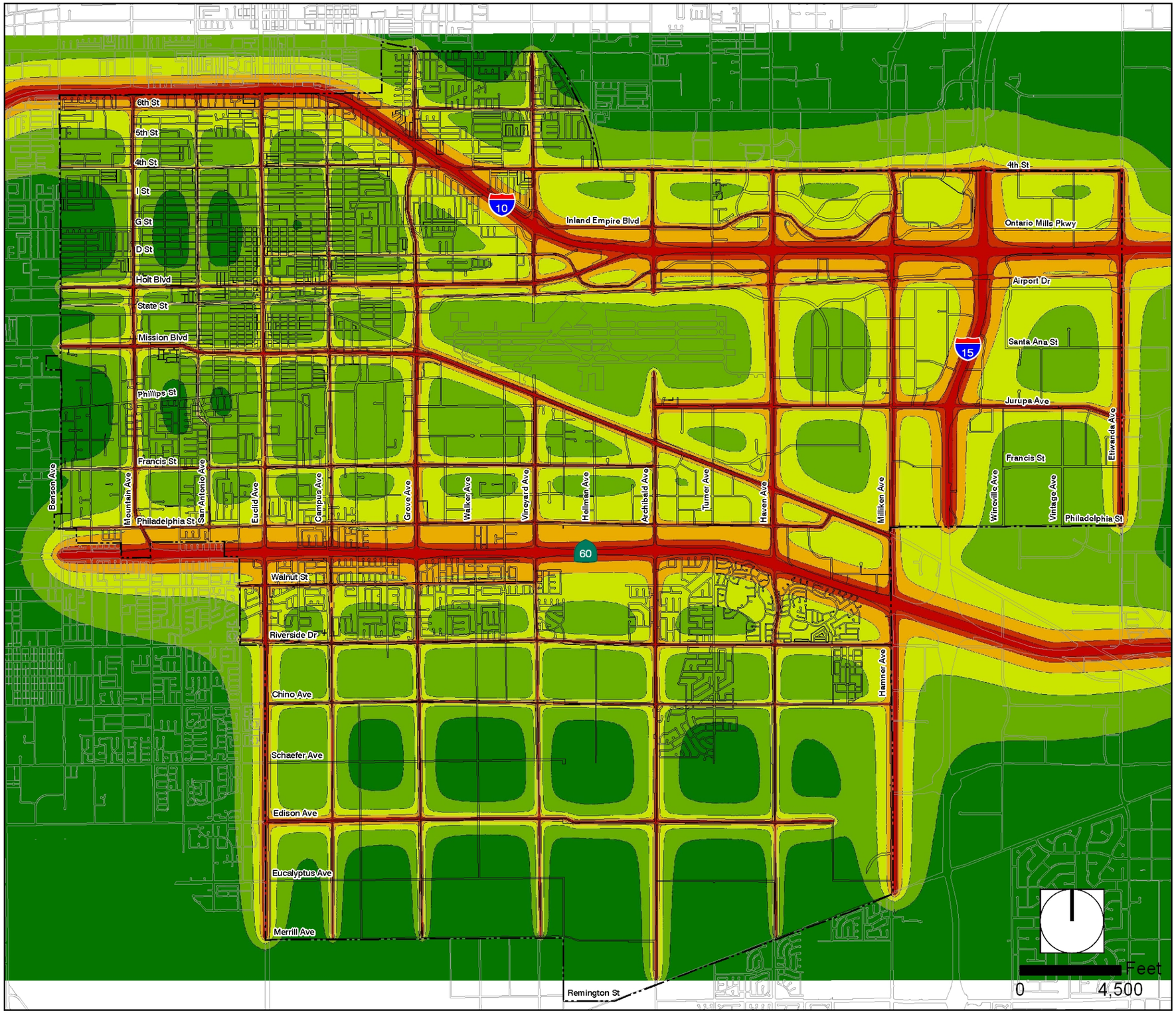
LEGEND

Clearly Acceptable:	No special noise insulation required, assuming buildings of normal conventional construction.
Normally Acceptable:	Acoustical reports will be required for major new residential construction. Conventional construction with closed windows and fresh air supply systems of air conditioning will normally suffice.
Normally Unacceptable:	New construction should be discouraged. Noise/aviation easements required for all new construction. If new construction does proceed, a detailed analysis of noise reduction requirements must be made and necessary noise insulation features included.
Clearly Unacceptable:	No new construction should be permitted.

Note: For noise compatibility criteria and contours for Ontario International Airport refer to the adopted ALUCP for ONT.

Figure S-3a

Future Roadway Noise Contours



Noise Level Ldn in dBA CNEL

	<= 60
60 <	<= 65
65 <	<= 70
70 <	<= 75
75 <	<= 80
80 <	

Source: SoundPlan Noise Model, Braunstein and Berndt, GmbH, Version 6.5. Noise contours do not take into account attenuation provided by building structures or masonry walls or noise from the Los Angeles Ontario International Airport, Chino Airport, or Union Pacific Railroad.

THE ONTARIO PLAN
A FRAMEWORK FOR THE FUTURE

Appendix B

Field Data and Photos

Field Sheet

Project: Toyota Arena Mixed Use Development **Engineer:** M. Torres

Date: 4/7/2021
JN: 2957-2021-02

Measurement Address: Toyota Arena
City: Ontario
Site No.: 1

Sound Level Meter:
Piccolo II
Serial # P0218042101
Serial # P0218092808
Serial # P0221010801
Serial # P0221010802

Calibrator:
CA114 Sound Calibrator
Serial # 500732

Calibration Record:

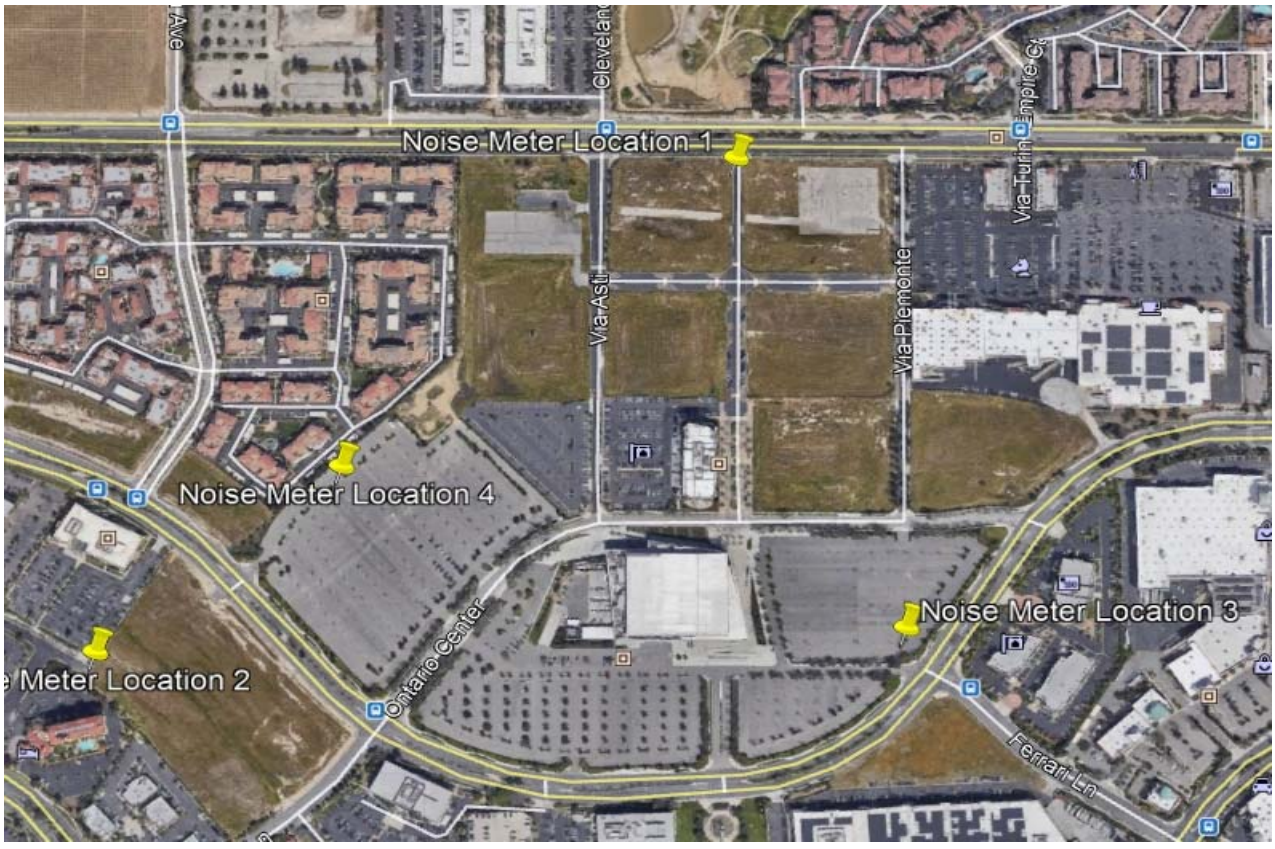
	Input, dB/	Reading, dB/	Offset, dB/	Time
1	94.0			9:47 AM
2	94.0			10:18 AM
3	94.0			10:47 AM
4	94.0			10:54 AM

Notes:
Temp: 55
Windspeed: 8 MPH
Direction: SSW
Skies: and Partly Cloudy
Camera:
Photo Nos.

Meter Settings:
☒ A-WTD ☐ LINEAR ☒ SLOW ☐ 1/1 OCT ☒ INTERVALS ___60____- MINUTE
☐ C-WTD ☐ IMPULSE ☐ FAST ☐ 1/3 OCT ☒ L_N PERCENTILE VALUES

Notes:

Measurement Type:
Long-term X
Short-term



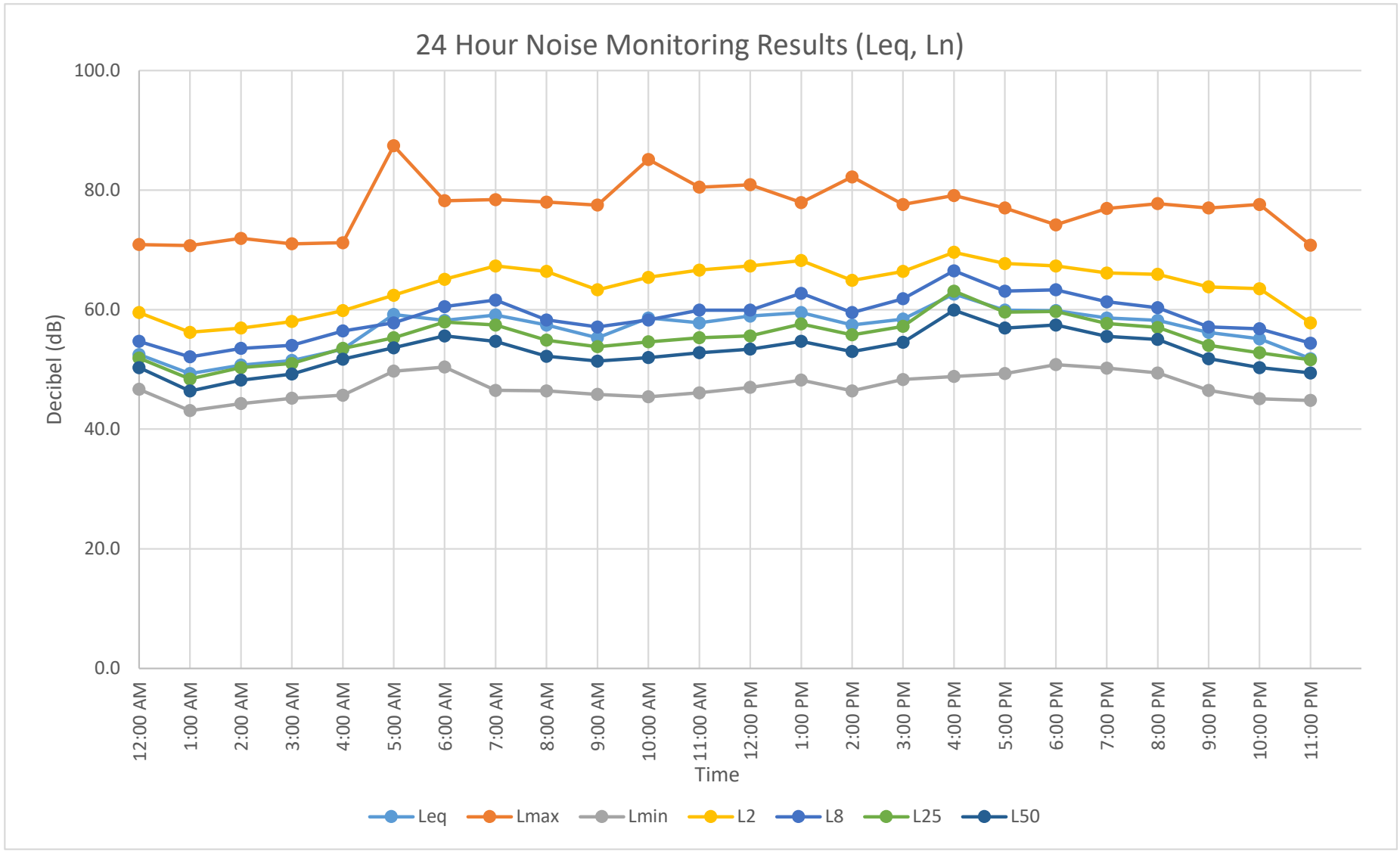
RK engineering group, inc.

Field Sheet - ST1 Location Photos

Project: Toyota Arena Mixed Use Development	**Engineer:** M. Torres	**Date:**	4/7/2021
		JN:	2957-2021-02
Measurement Address: Southwest Corner of Via Piemonte and Fourth Street.	**City:** Ontario	**Site No.:**	1

RK engineering group, inc.

PROJECT:	Toyota Arena Mixed Use Development					JOB #:	2957-2021-02
NOISE METER	Piccolo II SLM, 24-Hour Measurement					DATE:	07-Apr-21
LOCATION:	Southwest Corner of Resort Way and Haven Avenue					BY:	M. Torres
Time	Leq	Lmax	Lmin	L2	L8	L25	L50
12:00 AM	52.5	70.9	46.7	59.5	54.7	51.9	50.3
1:00 AM	49.3	70.7	43.1	56.2	52.1	48.4	46.4
2:00 AM	50.7	71.9	44.3	56.9	53.5	50.3	48.2
3:00 AM	51.5	71.0	45.2	58.0	54.0	51.0	49.2
4:00 AM	53.4	71.2	45.7	59.8	56.4	53.5	51.7
5:00 AM	59.2	87.4	49.7	62.4	57.8	55.3	53.6
6:00 AM	58.2	78.2	50.4	65.1	60.5	57.9	55.6
7:00 AM	59.1	78.4	46.5	67.3	61.6	57.4	54.7
8:00 AM	57.4	78.0	46.4	66.4	58.3	54.9	52.2
9:00 AM	55.3	77.5	45.8	63.3	57.1	53.8	51.4
10:00 AM	58.6	85.1	45.4	65.4	58.3	54.6	52.0
11:00 AM	57.8	80.5	46.1	66.6	59.9	55.3	52.8
12:00 PM	58.9	80.9	47.0	67.3	59.9	55.6	53.4
1:00 PM	59.5	77.9	48.2	68.2	62.7	57.6	54.7
2:00 PM	57.4	82.2	46.4	64.9	59.5	55.8	53.0
3:00 PM	58.4	77.6	48.3	66.4	61.8	57.2	54.5
4:00 PM	62.6	79.1	48.8	69.6	66.5	63.1	59.9
5:00 PM	59.9	77.0	49.3	67.7	63.1	59.6	56.9
6:00 PM	59.8	74.2	50.8	67.3	63.3	59.7	57.4
7:00 PM	58.6	76.9	50.2	66.1	61.3	57.7	55.5
8:00 PM	58.2	77.7	49.4	65.9	60.3	57.0	55.0
9:00 PM	56.2	77.0	46.5	63.8	57.1	54.0	51.8
10:00 PM	55.1	77.6	45.1	63.5	56.8	52.8	50.3
11:00 PM	51.8	70.8	44.8	57.8	54.4	51.6	49.4
Daytime	58.7	85.1	45.1	66.6	61.3	57.5	54.9
Nighttime	54.7	87.4	43.1	60.5	56.2	53.5	51.5


24 Hour Noise Monitoring Results (Leq, Ln)
100.0
80.0
60.0
40.0
20.0
0.0
Decibel (dB)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
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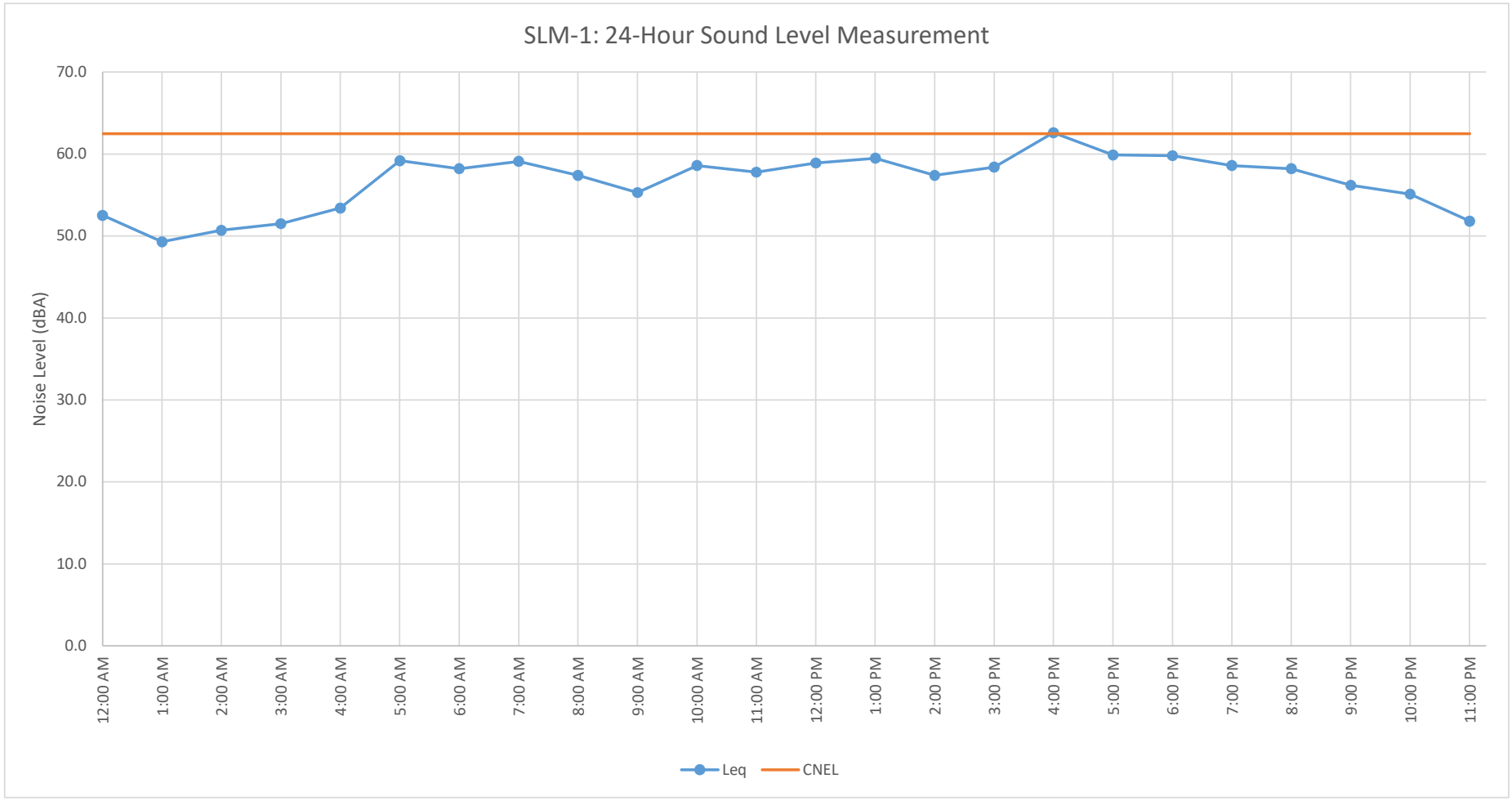
11:00 PM
Time
Leq
Lmax
Lmin
L2
L8
L25
L50

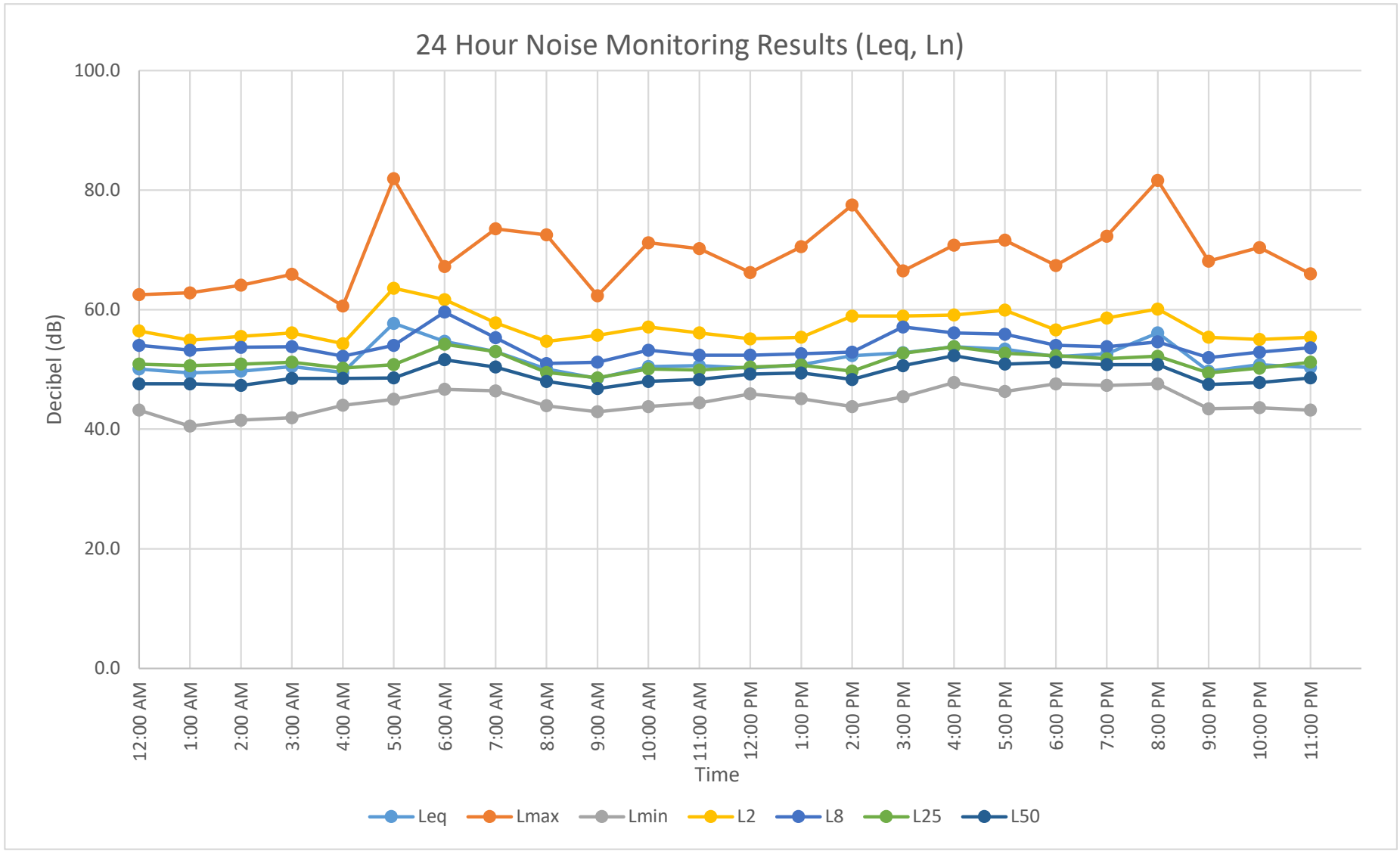

SLM-1: 24-Hour Sound Level Measurement
Noise Level (dBA)
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Leq
CNEL

Field Sheet - ST2 Location Photos

Project: Toyota Arena Mixed Use Development	**Engineer:** M. Torres	**Date:**	4/7/2021
		JN:	2957-2021-02
Measurement Address: East of Porsche Way, North of La Quinta Inn Site	**City:** Ontario	**Site No.:**	2

RK engineering group, inc.

PROJECT:	Toyota Arena Mixed Use Development					JOB #:	2957-2021-02
NOISE METER	Piccolo II SLM, 24-Hour Measurement					DATE:	07-Apr-21
LOCATION:	East of Porsche Way, North of La Quinta Inn Site					BY:	M. Torres
Time	Leq	Lmax	Lmin	L2	L8	L25	L50
12:00 AM	50.1	62.5	43.2	56.4	54.0	50.9	47.6
1:00 AM	49.4	62.8	40.5	54.9	53.2	50.6	47.6
2:00 AM	49.7	64.1	41.5	55.5	53.7	50.9	47.3
3:00 AM	50.5	65.9	41.9	56.1	53.8	51.2	48.5
4:00 AM	49.5	60.6	44.0	54.3	52.2	50.2	48.5
5:00 AM	57.7	81.9	45.0	63.6	54.0	50.8	48.6
6:00 AM	54.7	67.2	46.7	61.7	59.6	54.2	51.6
7:00 AM	53.0	73.5	46.4	57.8	55.3	53.0	50.4
8:00 AM	50.1	72.5	43.9	54.7	51.0	49.5	48.0
9:00 AM	48.5	62.3	42.9	55.7	51.2	48.6	46.8
10:00 AM	50.5	71.2	43.8	57.1	53.2	50.1	48.0
11:00 AM	50.6	70.2	44.4	56.1	52.4	49.9	48.3
12:00 PM	50.2	66.2	45.9	55.1	52.4	50.4	49.2
1:00 PM	50.8	70.5	45.1	55.4	52.6	50.7	49.4
2:00 PM	52.3	77.5	43.8	58.9	52.9	49.7	48.3
3:00 PM	52.8	66.5	45.4	58.9	57.1	52.7	50.6
4:00 PM	53.8	70.8	47.8	59.1	56.1	53.8	52.3
5:00 PM	53.4	71.6	46.3	59.9	55.9	52.7	50.9
6:00 PM	52.1	67.4	47.6	56.6	54.0	52.3	51.2
7:00 PM	52.6	72.3	47.3	58.6	53.8	51.8	50.8
8:00 PM	56.1	81.6	47.6	60.1	54.6	52.2	50.8
9:00 PM	49.7	68.1	43.4	55.4	52.0	49.4	47.5
10:00 PM	50.8	70.4	43.6	55.0	52.9	50.2	47.8
11:00 PM	50.3	66.0	43.2	55.4	53.6	51.2	48.6
Daytime	52.1	81.6	42.9	57.5	53.9	51.3	49.7
Nighttime	52.7	81.9	40.5	58.7	54.9	51.4	48.7


24 Hour Noise Monitoring Results (Leq, Ln)
100.0
80.0
60.0
40.0
20.0
0.0
Decibel (dB)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
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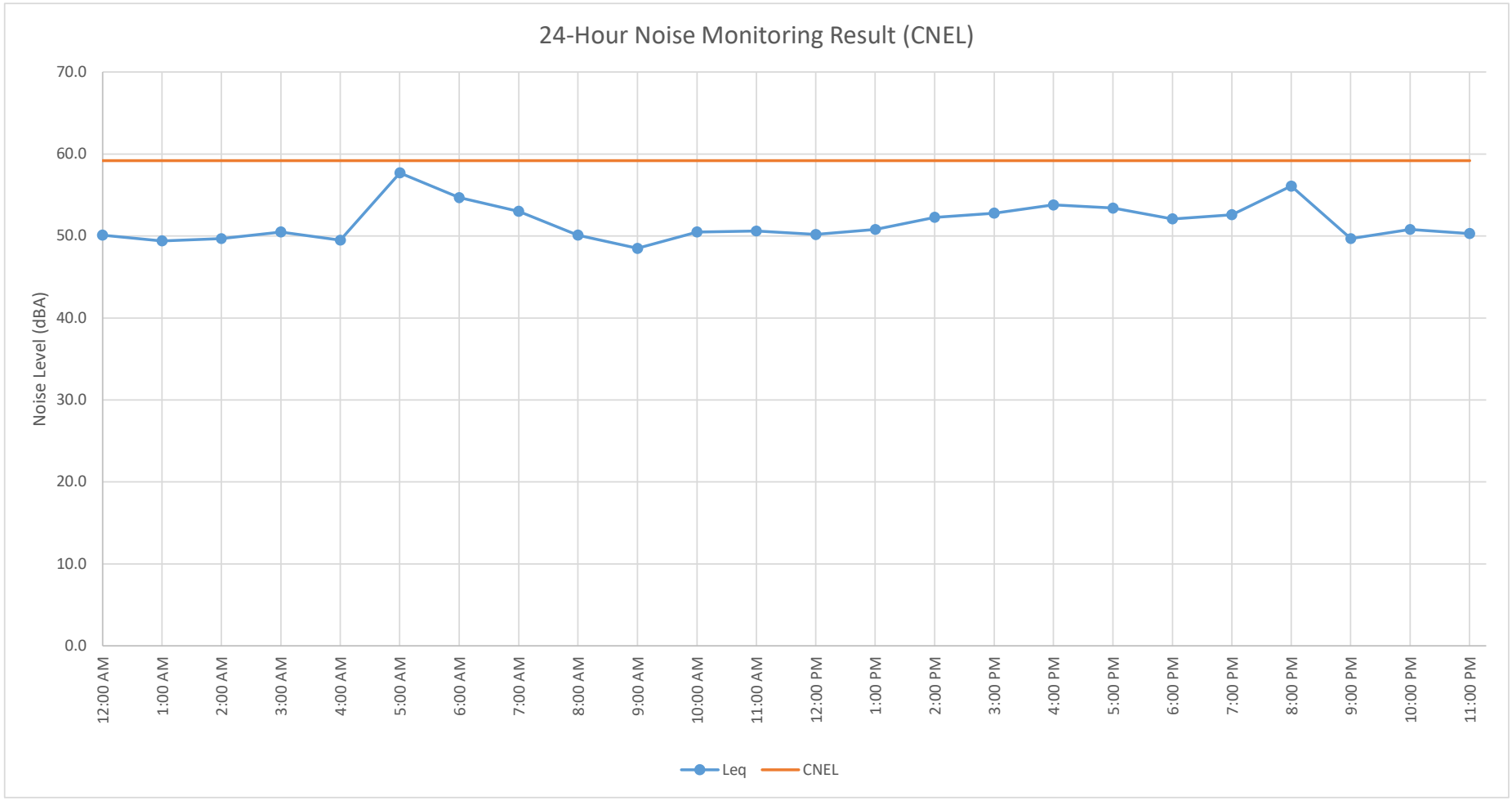
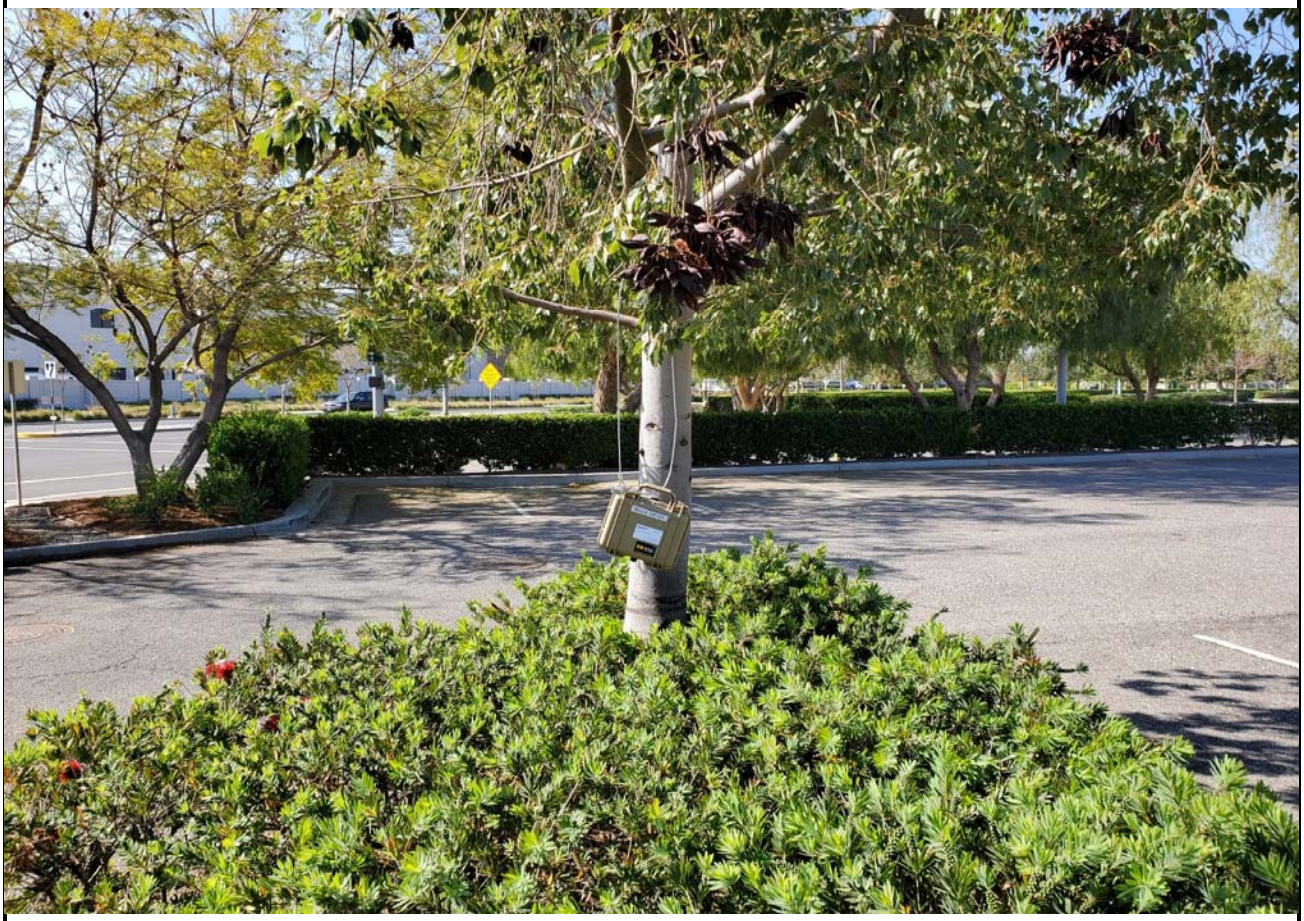
Time
Leq
Lmax
Lmin
L2
L8
L25
L50


24-Hour Noise Monitoring Result (CNEL)
Noise Level (dBA)
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Leq
CNEL

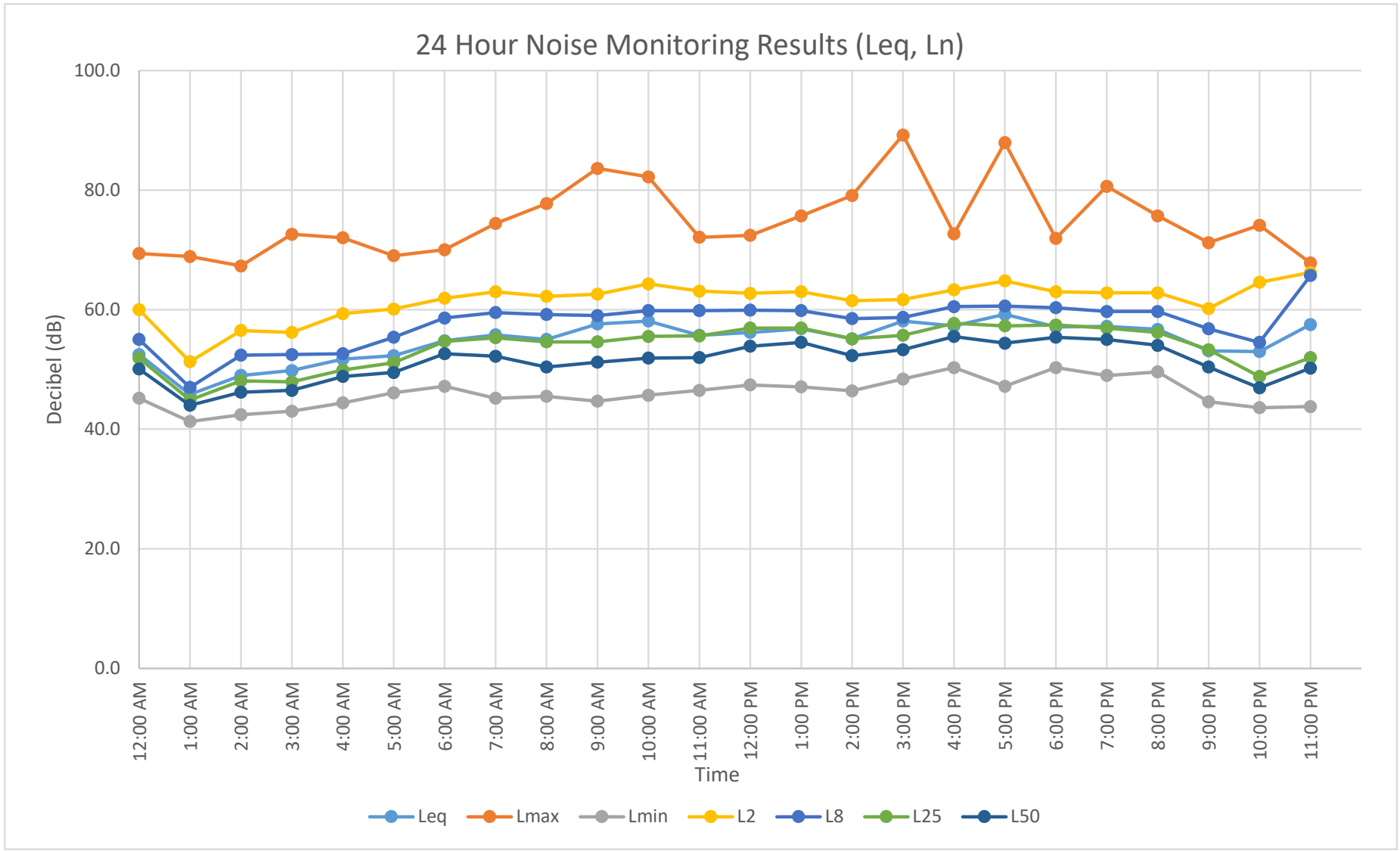
Field Sheet - ST3 Location Photos

Project: Toyota Arena Mixed Use Development **Engineer:** M. Torres		**Date:** 4/7/2021 **JN:** 2957-2021-02
Measurement Address: Northwest Corner of Concours Street and Ferrari Lane	**City:** Ontario	**Site No.:** 3



RK engineering group, inc.

PROJECT:	Toyota Arena Mixed Use Development					JOB #:	2957-2021-02
NOISE METER	Piccolo II SLM, 24-Hour Measurement					DATE:	07-Apr-21
LOCATION:	Northwest Corner of Concours Street and Ferrari Lane					BY:	M. Torres
Time	Leq	Lmax	Lmin	L2	L8	L25	L50
12:00 AM	52.5	69.4	45.2	60.0	55.0	51.9	50.1
1:00 AM	45.8	68.9	41.3	51.3	47.0	44.9	44.0
2:00 AM	49.0	67.3	42.4	56.5	52.4	48.1	46.2
3:00 AM	49.8	72.6	43.0	56.2	52.5	47.9	46.5
4:00 AM	51.7	72.0	44.4	59.3	52.6	49.9	48.8
5:00 AM	52.3	69.0	46.1	60.1	55.4	51.1	49.5
6:00 AM	54.8	70.0	47.2	61.9	58.6	54.7	52.6
7:00 AM	55.8	74.4	45.2	63.0	59.5	55.3	52.2
8:00 AM	55.0	77.7	45.5	62.2	59.2	54.6	50.4
9:00 AM	57.6	83.6	44.7	62.6	59.0	54.6	51.2
10:00 AM	58.1	82.2	45.7	64.3	59.8	55.5	51.9
11:00 AM	55.7	72.1	46.5	63.1	59.8	55.6	52.0
12:00 PM	56.2	72.4	47.4	62.7	59.9	56.9	53.9
1:00 PM	56.8	75.7	47.1	63.0	59.8	56.9	54.5
2:00 PM	55.1	79.1	46.4	61.5	58.5	55.1	52.3
3:00 PM	58.1	89.2	48.4	61.7	58.7	55.7	53.3
4:00 PM	57.3	72.7	50.3	63.3	60.5	57.7	55.5
5:00 PM	59.2	87.9	47.2	64.8	60.6	57.3	54.4
6:00 PM	57.1	71.9	50.3	63.0	60.3	57.4	55.4
7:00 PM	57.2	80.6	49.0	62.8	59.7	56.9	55.0
8:00 PM	56.7	75.7	49.6	62.8	59.7	56.2	54.0
9:00 PM	53.1	71.2	44.6	60.2	56.8	53.3	50.4
10:00 PM	53.0	74.1	43.6	64.6	54.5	48.8	46.9
11:00 PM	57.5	67.8	43.8	66.2	65.7	52.0	50.2
Daytime	56.7	89.2	43.6	63.0	59.4	55.9	53.2
Nighttime	52.9	72.6	41.3	60.8	58.5	50.9	49.2


24 Hour Noise Monitoring Results (Leq, Ln)
100.0
80.0
60.0
40.0
20.0
0.0
Decibel (dB)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
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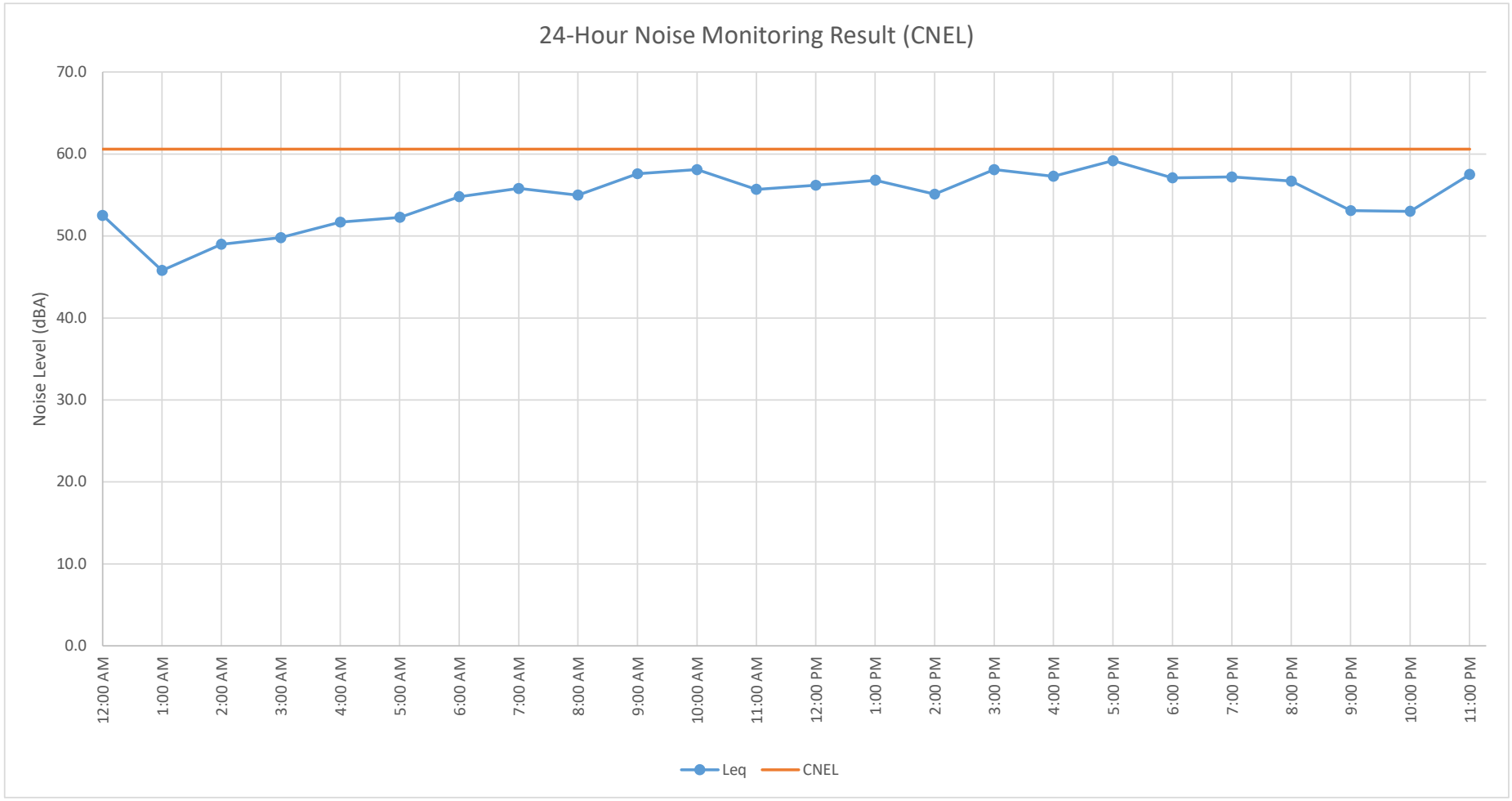
Lmin
L2
L8
L25
L50

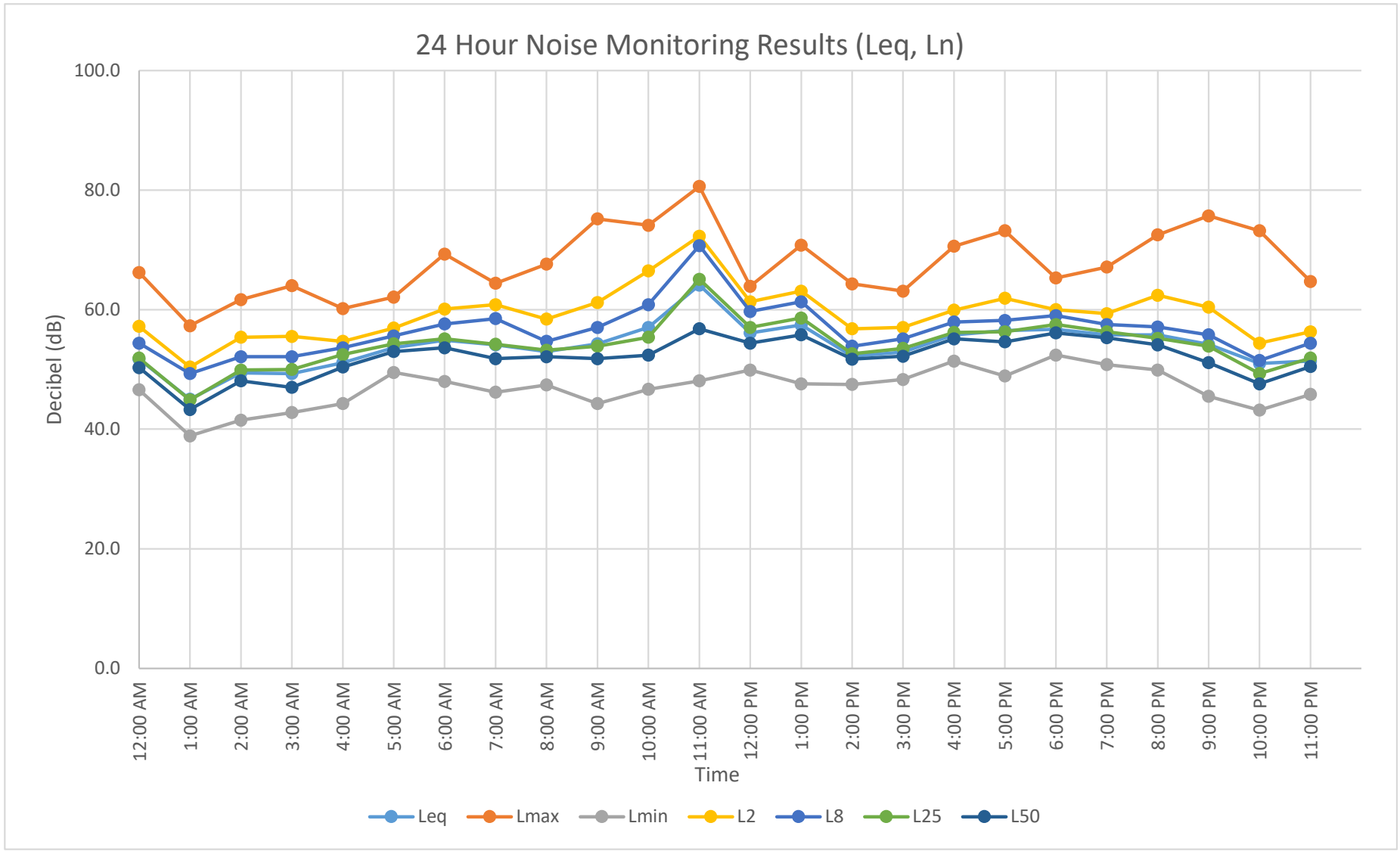

24-Hour Noise Monitoring Result (CNEL)
Noise Level (dBA)
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Leq
CNEL

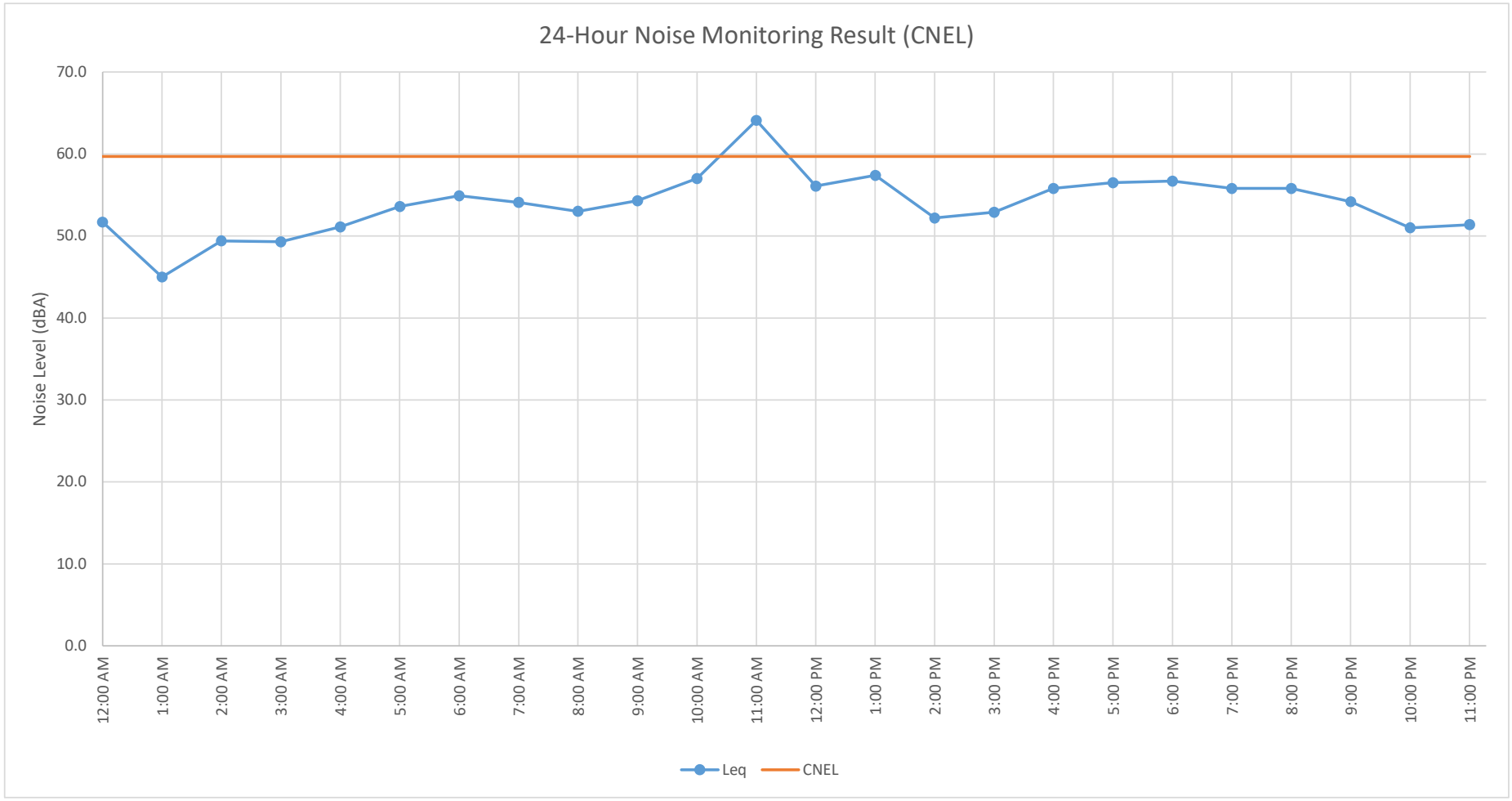
Field Sheet - ST4 Location Photos

Project: Toyota Arena Mixed Use Development **Engineer:** M. Torres	**Date:**	4/7/2021
	JN:	2957-2021-02
Measurement Address: In the parking lot along Western Project Site Boundary **City:** Ontario	**Site No.:**	4

RK engineering group, inc.

PROJECT:	Toyota Arena Mixed Use Development					JOB #:	2957-2021-02
NOISE METER	Piccolo II SLM, 24-Hour Measurement					DATE:	07-Apr-21
LOCATION:	In the parking lot, along Western Project Site Boundary					BY:	M. Torres
Time	Leq	Lmax	Lmin	L2	L8	L25	L50
12:00 AM	51.7	66.2	46.6	57.2	54.4	51.9	50.3
1:00 AM	45.0	57.3	38.9	50.4	49.3	44.9	43.3
2:00 AM	49.4	61.7	41.5	55.4	52.1	49.9	48.1
3:00 AM	49.3	64.0	42.8	55.5	52.1	50.0	47.0
4:00 AM	51.1	60.2	44.3	54.7	53.6	52.5	50.4
5:00 AM	53.6	62.1	49.5	56.9	55.6	54.3	53.0
6:00 AM	54.9	69.3	48.0	60.1	57.6	55.1	53.6
7:00 AM	54.1	64.4	46.2	60.8	58.5	54.2	51.8
8:00 AM	53.0	67.6	47.4	58.4	54.7	53.2	52.1
9:00 AM	54.3	75.2	44.3	61.2	57.0	53.9	51.8
10:00 AM	57.0	74.1	46.7	66.5	60.8	55.4	52.4
11:00 AM	64.1	80.6	48.1	72.3	70.7	65.1	56.8
12:00 PM	56.1	63.9	49.9	61.3	59.7	57.0	54.4
1:00 PM	57.4	70.8	47.6	63.1	61.3	58.6	55.8
2:00 PM	52.2	64.3	47.5	56.8	53.9	52.6	51.7
3:00 PM	52.9	63.1	48.3	57.0	55.1	53.5	52.2
4:00 PM	55.8	70.6	51.4	59.9	57.9	56.2	55.1
5:00 PM	56.5	73.2	48.9	61.9	58.2	56.3	54.6
6:00 PM	56.7	65.3	52.4	60.0	59.0	57.5	56.1
7:00 PM	55.8	67.1	50.8	59.3	57.5	56.3	55.3
8:00 PM	55.8	72.5	49.9	62.4	57.1	55.2	54.1
9:00 PM	54.2	75.7	45.5	60.4	55.8	53.9	51.1
10:00 PM	51.0	73.2	43.2	54.4	51.5	49.3	47.6
11:00 PM	51.4	64.7	45.8	56.3	54.4	51.9	50.5
Daytime	56.7	80.6	43.2	63.6	61.2	57.2	53.9
Nighttime	51.6	69.3	38.9	56.5	54.2	52.1	50.5


24 Hour Noise Monitoring Results (Leq, Ln)
100.0
80.0
60.0
40.0
20.0
0.0
Decibel (dB)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Time
Leq
Lmax
Lmin
L2
L8
L25
L50


24-Hour Noise Monitoring Result (CNEL)
Noise Level (dBA)
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Leq
CNEL

Appendix C

Stationary Noise Analysis Results

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Parking Lot F and Parking Lot G	DATE:	27-May-21
LOCATION:	Residential Uses to the north of Lot F & G	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	170.0			
DT WALL=	0.0			
DT W/OB=	170.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	0.0		NOISE HTH EL=	3.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	6					63.8	
PROJ LEVEL	170					34.8	
SHIELDING	170					0.0	
ADJ LEVEL	170	***0.0***	***0.0***	***0.0***	***0.0***	***34.8***	***0.0***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -29.0459534

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot C HVAC	DATE:	27-May-21
LOCATION:	Residential West of Lot C	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	520.0			
DT WALL=	0.0			
DT W/OB=	520.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	77.0	77.0	77.0	77.0	77.0	77.0
PROJ LEVEL	520	32.2	32.2	32.2	32.2	32.2	32.2
SHIELDING	520	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	520	***32.2***	***32.2***	***32.2***	***32.2***	***32.2***	***32.2***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -44.7776418

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot F Parking Lot	DATE:	27-May-21
LOCATION:	Residential West of Lot C	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	745.0			
DT WALL=	0.0			
DT W/OB=	745.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	6					63.8	
PROJ LEVEL	745	-41.9	-41.9	-41.9	-41.9	21.9	-41.9
SHIELDING	745	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	745	***-41.9***	***-41.9***	***-41.9***	***-41.9***	***21.9***	***-41.9***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -41.8801004

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot A HVAC	DATE:	27-May-21
LOCATION:	Commercial South of Lot C and Lot D	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	223.0			
DT WALL=	0.0			
DT W/OB=	223.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	77.0	77.0	77.0	77.0	77.0	77.0
PROJ LEVEL	223	39.6	39.6	39.6	39.6	39.6	39.6
SHIELDING	223	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	223	***39.6***	***39.6***	***39.6***	***39.6***	***39.6***	***39.6***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -37.4236722

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot C HVAC	DATE:	27-May-21
LOCATION:	Commercial South of Lot C and Lot D	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	253.0			
DT WALL=	0.0			
DT W/OB=	253.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	77.0	77.0	77.0	77.0	77.0	77.0
PROJ LEVEL	253	38.5	38.5	38.5	38.5	38.5	38.5
SHIELDING	253	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	253	***38.5***	***38.5***	***38.5***	***38.5***	***38.5***	***38.5***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -38.5199853

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot D HVAC	DATE:	27-May-21
LOCATION:	Commercial South of Lot C and Lot D	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	253.0			
DT WALL=	0.0			
DT W/OB=	253.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	77.0	77.0	77.0	77.0	77.0	77.0
PROJ LEVEL	253	38.5	38.5	38.5	38.5	38.5	38.5
SHIELDING	253	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	253	***38.5***	***38.5***	***38.5***	***38.5***	***38.5***	***38.5***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -38.5199853

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot F & G Parking Lot	DATE:	27-May-21
LOCATION:	Commercial South of Lot C and Lot D	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	540.0			
DT WALL=	0.0			
DT W/OB=	540.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	6					63.8	
PROJ LEVEL	540	-39.1	-39.1	-39.1	-39.1	24.7	-39.1
SHIELDING	540	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	540	***-39.1***	***-39.1***	***-39.1***	***-39.1***	***24.7***	***-39.1***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -39.0848502

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot D HVAC	DATE:	27-May-21
LOCATION:	Commercial East of Lot D	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	495.0			
DT WALL=	0.0			
DT W/OB=	495.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	77.0	77.0	77.0	77.0	77.0	77.0
PROJ LEVEL	495	32.7	32.7	32.7	32.7	32.7	32.7
SHIELDING	495	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	495	***32.7***	***32.7***	***32.7***	***32.7***	***32.7***	***32.7***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -44.3496789

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot G Parking Lot	DATE:	27-May-21
LOCATION:	Commercial East of Lot D	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	180.0			
DT WALL=	0.0			
DT W/OB=	180.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	6					63.8	
PROJ LEVEL	180	-29.5	-29.5	-29.5	-29.5	34.3	-29.5
SHIELDING	180	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	180	***-29.5***	***-29.5***	***-29.5***	***-29.5***	***34.3***	***-29.5***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -29.5424251

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot A HVAC	DATE:	27-May-21
LOCATION:	Commercial East of Lot A	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	223.0			
DT WALL=	0.0			
DT W/OB=	223.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	77.0	77.0	77.0	77.0	77.0	77.0
PROJ LEVEL	223	39.6	39.6	39.6	39.6	39.6	39.6
SHIELDING	223	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	223	***39.6***	***39.6***	***39.6***	***39.6***	***39.6***	***39.6***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -37.4236722

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot B HVAC	DATE:	27-May-21
LOCATION:	Commercial East of Lot A	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	235.0			
DT WALL=	0.0			
DT W/OB=	235.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	77.0	77.0	77.0	77.0	77.0	77.0
PROJ LEVEL	235	39.1	39.1	39.1	39.1	39.1	39.1
SHIELDING	235	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	235	***39.1***	***39.1***	***39.1***	***39.1***	***39.1***	***39.1***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -37.8789322

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot B HVAC	DATE:	27-May-21
LOCATION:	Commercial South of Lot B	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	590.0			
DT WALL=	0.0			
DT W/OB=	590.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	77.0	77.0	77.0	77.0	77.0	77.0
PROJ LEVEL	590	31.1	31.1	31.1	31.1	31.1	31.1
SHIELDING	590	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	590	***31.1***	***31.1***	***31.1***	***31.1***	***31.1***	***31.1***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -45.8746151

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2964-2021-02
SOURCE:	Lot B HVAC	DATE:	27-May-21
LOCATION:	Commercial South of Lot B	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	260.0			
DT WALL=	0.0			
DT W/OB=	260.0			
HTH WALL=	0.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	0.00
NOISE EL =	55.0		NOISE HTH EL=	58.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	77.0	77.0	77.0	77.0	77.0	77.0
PROJ LEVEL	260	38.2	38.2	38.2	38.2	38.2	38.2
SHIELDING	260	0.0	0.0	0.0	0.0	0.0	0.0
ADJ LEVEL	260	***38.2***	***38.2***	***38.2***	***38.2***	***38.2***	***38.2***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -38.7570419

NOISE INTERVAL AVERAGER (2.0)

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2957-2021-2
LOCATION:	Receptor 2	DATE:	27-May-21
SOURCE:	Combined Noise Levels	BY:	D.Shivaiah

NOISE LEVEL MEASUREMENTS (dBA)

	NOISE SOURCE	LEQ	L(MAX)	L(2)	L(8)	L(25)	L(50)
1	Lot C					32.2	
2	Lot F					21.9	
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
	TOTAL	#NUM!	#NUM!	#NUM!	#NUM!	32.6	#NUM!

NOISE INTERVAL AVERAGER (2.0)

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2957-2021-2
LOCATION:	Receptor 3	DATE:	27-May-21
SOURCE:	Combined Noise Levels	BY:	D.Shivaiah

NOISE LEVEL MEASUREMENTS (dBA)

	NOISE SOURCE	LEQ	L(MAX)	L(2)	L(8)	L(25)	L(50)
1	Lot A					39.6	
2	Lot C					38.5	
3	Lot D					38.5	
4	Lot F & Lot G					24.7	
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
	TOTAL	#NUM!	#NUM!	#NUM!	#NUM!	43.7	#NUM!

NOISE INTERVAL AVERAGER (2.0)

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2957-2021-2
LOCATION:	Receptor 4	DATE:	27-May-21
SOURCE:	Combined Noise Levels	BY:	D.Shivaiah

NOISE LEVEL MEASUREMENTS (dBA)

	NOISE SOURCE	LEQ	L(MAX)	L(2)	L(8)	L(25)	L(50)
1	Lot D					32.7	
2	Lot G					34.3	
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
	TOTAL	#NUM!	#NUM!	#NUM!	#NUM!	36.6	#NUM!

NOISE INTERVAL AVERAGER (2.0)

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2957-2021-2
LOCATION:	Receptor 5	DATE:	27-May-21
SOURCE:	Combined Noise Levels	BY:	D.Shivaiah

NOISE LEVEL MEASUREMENTS (dBA)

	NOISE SOURCE	LEQ	L(MAX)	L(2)	L(8)	L(25)	L(50)
1	Lot A					39.6	
2	Lot B					39.1	
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
	TOTAL	#NUM!	#NUM!	#NUM!	#NUM!	42.4	#NUM!

NOISE INTERVAL AVERAGER (2.0)

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2957-2021-2
LOCATION:	Receptor 6	DATE:	27-May-21
SOURCE:	Combined Noise Levels	BY:	D.Shivaiah

NOISE LEVEL MEASUREMENTS (dBA)

	NOISE SOURCE	LEQ	L(MAX)	L(2)	L(8)	L(25)	L(50)
1	Lot A					31.1	
2	Lot B					38.2	
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
	TOTAL	#NUM!	#NUM!	#NUM!	#NUM!	39.0	#NUM!

Appendix D

Construction Noise and Vibration
Analysis Results

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/27/2021
Case Description: Toyota Arena Mixed Use Development

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Demolition	Residential	80	60	45

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Concrete Saw	No	20		89.6	160	0
Excavator	No	40		80.7	160	0
Dozer	No	40		81.7	160	0
Excavator	No	40		80.7	160	0
Excavator	No	40		80.7	160	0
Dozer	No	40		81.7	160	0

		Results	
		Calculated (dBA)	
Equipment		*Lmax	Leq
Concrete Saw		79.5	72.5
Excavator		70.6	66.6
Dozer		71.6	67.6
Excavator		70.6	66.6
Excavator		70.6	66.6
Dozer		71.6	67.6
	Total	79.5	76.3

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/27/2021
Case Description: Toyota Arena Mixed Use Development

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Site Preparation	Residential	80	60	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	160	0
Tractor	No	40	84		160	0
Dozer	No	40		81.7	160	0
Tractor	No	40	84		160	0
Tractor	No	40	84		160	0
Dozer	No	40		81.7	160	0
Tractor	No	40	84		160	0

Results

		Calculated (dBA)	
Equipment		*Lmax	Leq
Dozer		71.6	67.6
Tractor		73.9	69.9
Dozer		71.6	67.6
Tractor		73.9	69.9
Tractor		73.9	69.9
Dozer		71.6	67.6
Tractor		73.9	69.9
	Total	73.9	77.5

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/27/2021
Case Description: Toyota Arena Mixed Use Development

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Grading	Residential	80	60	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	160	0
Grader	No	40	85		160	0
Dozer	No	40		81.7	160	0
Scraper	No	40		83.6	160	0
Tractor	No	40	84		160	0
Excavator	No	40		80.7	160	0
Scraper	No	40		83.6	160	0
Tractor	No	40	84		160	0

	Results			
	Calculated (dBA)		Noise Limits (dBA)	
Equipment	*Lmax	Leq		
Excavator	70.6	66.6		
Grader	74.9	70.9		
Dozer	71.6	67.6		
Scraper	73.5	69.5		
Tractor	73.9	69.9		
Excavator	70.6	66.6		
Scraper	73.5	69.5		
Tractor	73.9	69.9		
Total	74.9	78.1		

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/27/2021
Case Description: Toyota Arena Mixed Use Development

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Building Construction	Residential	80	60	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	160	0
Pickup Truck	No	40		75	160	0
Generator	No	50		80.6	160	0
Tractor	No	40	84		160	0
Welder / Torch	No	40		74	160	0
Pickup Truck	No	40		75	160	0
Pickup Truck	No	40		75	160	0
Tractor	No	40	84		160	0
Tractor	No	40	84		160	0

Results

		Calculated (dBA)	
Equipment		*Lmax	Leq
Crane		70.4	62.5
Pickup Truck		64.9	60.9
Generator		70.5	67.5
Tractor		73.9	69.9
Welder / Torch		63.9	59.9
Pickup Truck		64.9	60.9
Pickup Truck		64.9	60.9
Tractor		73.9	69.9
Tractor		73.9	69.9
	Total	73.9	76.2

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/27/2021
Case Description: Toyota Arena Mixed Use Development

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Paving	Residential	80	60	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	160	0
Paver	No	50		77.2	160	0
Roller	No	20		80	160	0
Concrete Mixer Truck	No	40		78.8	160	0
Paver	No	50		77.2	160	0
Roller	No	20		80	160	0

Results

	Calculated (dBA)	
Equipment	*Lmax	Leq
Concrete Mixer Truck	68.7	64.7
Paver	67.1	64.1
Roller	69.9	62.9
Concrete Mixer Truck	68.7	64.7
Paver	67.1	64.1
Roller	69.9	62.9
Total	69.9	71.8

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/27/2021
Case Description: Toyota Arena Mixed Use Development

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Architectural Coating	Residential	80	60	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	160	0

Results

		Calculated (dBA)	
Equipment		*Lmax	Leq
Compressor (air)		67.6	63.6
	Total	67.6	63.6

*Calculated Lmax is the Loudest value.

VIBRATION IMPACTS FROM CONSTRUCTION AND OPERATIONS

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2957-2021-02
ACTIVITY:	Caisson Drilling	DATE:	27-May-21
LOCATION:	Nearest Structure at 50 Feet	ENGINEER:	D. Shivaiah

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.042 in/sec**

Equipment Type =	3	Caisson Drilling
PPV_{ref} =	0.089	Reference PPV at 25 ft.
D =	50.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV at 25 ft. (in/sec)
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

VIBRATION IMPACTS FROM CONSTRUCTION AND OPERATIONS

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2957-2021-02
ACTIVITY:	Large Bulldozer	DATE:	27-May-21
LOCATION:	Nearest Structure at 50 Feet	ENGINEER:	D. Shivaiah

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.042 in/sec**

Equipment Type =	2	Large Bulldozer
PPV_{ref} =	0.089	Reference PPV at 25 ft.
D =	50.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV at 25 ft. (in/sec)
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2957-2021-02
ACTIVITY:	Loaded Truck	DATE:	27-May-21
LOCATION:	Nearest Structure at 50 Feet	ENGINEER:	D. Shivaiah

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.035 in/sec**

Equipment Type =	4	Loaded Trucks
PPV_{ref} =	0.076	Reference PPV at 25 ft.
D =	50.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV at 25 ft. (in/sec)
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

VIBRATION IMPACTS FROM CONSTRUCTION AND OPERATIONS

PROJECT:	Toyota Arena Mixed Use Development	JOB #:	2957-2021-02
ACTIVITY:	Vibratory Roller	DATE:	27-May-21
LOCATION:	Nearest Structure at 50 Feet	ENGINEER:	D. Shivaiah

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.098 in/sec**

Equipment Type =	1	Vibratory Roller
PPV_{ref} =	0.210	Reference PPV at 25 ft.
D =	50.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV at 25 ft. (in/sec)
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

City of Ontario
Planning Department
303 East B Street
Ontario, California 91764
Phone: 909.395.2036
Fax: 909.395.2420

California Environmental Quality Act

Mitigation Monitoring and Reporting Program

Project Title: Piemonte Overlay for Ontario Center Specific Plan **/ File No.:** PSPA16-003

Project Sponsors: Lewis Piemonte Land, LLC, c/o David Robbins, Lewis Management Corp., 1156 N Mountain Avenue, Upland, California 91785, Phone: 909.949.6781, Email: david.robbins@lewismc.com; and Pendulum Property Partners, c/o Kevin Hayes, 5 Park Plaza, Suite 370, Irvine, California 92614, Phone: 949.449.1381, Email: khayes@pendulumpp.com

Lead Agency: City of Ontario Planning Department, 303 East B Street, Ontario, California 91764, (909) 395-2036

Contact Person: Charles Mercier, Senior Planner; Phone: 909.395.2425, Email: cmercier@ontarioca.com

Mitigation Measures/Implementing Action	*Responsible for Monitoring*	*Monitoring Frequency*	*Timing of Verification*	*Method of Verification*	*Verified (Initial/Date)*	*Sanctions for Noncompliance*
1) AIR QUALITY						
a) Use of dust control during clearing, grading and construction. Fugitive dust generated during cleaning, grading, earth moving or excavation shall be controlled by regular watering, paving of construction roads, or other dust-preventative measures. If freshwater resources are too precious to waste on dust control, availability of brackish or reclaimed water sources shall be investigated. Soil disturbance shall be terminated when high winds (25 mph or greater) make dust control extremely difficult.	Building Dept & Planning Dept	Throughout construction	As necessary	On-site inspection		Stop work order; or withhold grading permit; or withhold building permit
b) Minimization of construction interference with regional non-project traffic movement. Impacts shall be reduced to below a level of significance by the following mitigation measures: **i)** Scheduling receipt of construction materials to non-peak travel periods. **ii)** Routing construction traffic through areas of least impact sensitivity. **iii)** Limiting lane closures and detours to off-peak travel periods. **iv)** Providing rideshare incentives for contractor and subcontractor personnel.	Building Dept & Planning Dept	Throughout construction	As necessary	On-site inspection		Stop work order; or withhold grading permit; or withhold building permit
c) After clearing, grading or earth moving: **i)** Seed and water until plant cover is established.	Building Dept & Planning Dept	Throughout construction	As necessary	On-site inspection		Stop work order; or withhold grading permit; or withhold

Mitigation Measures/Implementing Action	*Responsible for Monitoring*	*Monitoring Frequency*	*Timing of Verification*	*Method of Verification*	*Verified (Initial/Date)*	*Sanctions for Noncompliance*
ii) Spread soil binders. **iii)** Form and maintain a crust on the surface through repeated soaking that will prevent dust pickup by wind. **iv)** Reduce "spill-over" effects by washing vehicles entering public roadways from dirt off road project areas, and washing/sweeping project access to public roadways on an adequate schedule.						building permit
d) Emissions control from on-site equipment through a routine, mandatory program of low-emission tune-ups.	Building Dept & Planning Dept	Throughout construction	As necessary	On-site inspection		Stop work order; or withhold grading permit; or withhold building permit
2) BIOLOGICAL RESOURCES						
a) Thirty to ninety days prior to ground disturbing construction-related activities, a focused survey for the burrowing owl shall be conducted by a qualified biologist. Should any burrowing owls be located on the project site, the below-listed mitigation measures shall be completed: **i)** Occupied burrows should not be disturbed during nesting season (February 1 through August 31) unless a qualified biologist verifies through non-invasive methods, that: (1) Birds have not begun egg-laying and incubation; or (2) Juveniles from the occupied burrows are foraging independently and are capable of independent survival. **ii)** If owls must be moved away from the disturbance area, relocation techniques shall be used as established in the California Department of Fish and Game, Natural Resources Agency, "Staff Report on Burrowing Owls," dated March 7, 2012.	Planning Dept.	Grading Plan issuance	Prior to issuance of grading permits	Plan check		Withhold grading permit
3) GEOLOGY & SOILS						
a) The applicant shall submit an erosion control plan to reduce wind erosion impacts.	Building Dept, Planning Dept & Engineering Dept	Grading Plan issuance		Plan check		Withhold grading permit
b) Fugitive dust generated during cleaning, grading, earth moving or excavation shall be controlled by regular watering, paving of construction roads, or other dust-preventative measures.	Building Dept	Throughout construction	As necessary	On-site inspection		Stop work order; or withhold grading permit; or withhold building permit
c) After clearing, grading, or earth moving: **i)** Seed and water until plant cover is established.	Building Dept & Planning Dept	Throughout construction	As necessary	On-site inspection		Stop work order; or withhold grading permit; or withhold

Mitigation Measures/Implementing Action	*Responsible for Monitoring*	*Monitoring Frequency*	*Timing of Verification*	*Method of Verification*	*Verified (Initial/Date)*	*Sanctions for Noncompliance*
ii) Spread soil binders. **iii)** Form and maintain a crust on the surface through repeated soaking that will prevent dust pickup by wind. **iv)** Sweep streets if silt is carried to adjacent public thoroughfares						building permit
d) Obtain authorization to discharge storm water under an NPDES construction storm water permit and pay appropriate fees.	Engineering Dept	Grading Plan issuance	Prior to issuance of grading permits	Plan check		Withhold grading permit
4) GREENHOUSE GAS EMISSIONS						
a) The City has reviewed the emission reduction measures and concepts in The Ontario Plan EIR MM 6-2 and 6-3, and has determined that the following actions apply and shall be undertaken by the applicant in connection with the project: **i)** Evaluate existing landscaping and options to convert reflective and impervious surfaces to landscaping, and install or replace vegetation with drought-tolerant, low-maintenance native species or edible landscaping that can also provide shade and reduce heat-island effects. **ii)** Require all new landscaping irrigation systems installed to be automated, high-efficient irrigation systems to reduce water use and require use of bubbler irrigation; low-angle, low-flow spray heads; or moisture sensors. **iii)** Reduce heat gain from pavement and other similar hardscaping. **iv)** All new development shall comply with the requirements of the City of Ontario Community Climate Action Plan.	Building Dept & Planning Dept	Throughout construction	As necessary	Plan check/On-site inspection		Stop work order; or withhold building permit
5) MANDATORY FINDINGS OF SIGNIFICANCE						
a) Thirty to ninety days prior to ground disturbing construction-related activities, a focused survey for the burrowing owl shall be conducted by a qualified biologist. Should any burrowing owls be located on the project site, the below-listed mitigation measures shall be completed:	Planning Dept.	Grading Plan issuance	Prior to issuance of grading permits	Plan check		Withhold grading permit
i) Occupied burrows should not be disturbed during nesting season (February 1 through August 31) unless a qualified biologist verifies through non-invasive methods, that:						
(1) Birds have not begun egg-laying and incubation; or						
(2) Juveniles from the occupied burrows are foraging independently and are capable of independent survival.						

Mitigation Measures/Implementing Action	***Responsible for Monitoring***	***Monitoring Frequency***	***Timing of Verification***	***Method of Verification***	***Verified (Initial/Date)***	***Sanctions for Noncompliance***
ii) If owls must be moved away from the disturbance area, relocation techniques shall be used as established in the California Department of Fish and Game, Natural Resources Agency, "Staff Report on Burrowing Owls," dated March 7, 2012.						

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, APPROVING FILE NO. PSPA21-001, AN AMENDMENT TO THE PIEMONTE OVERLAY AT THE ONTARIO CENTER SPECIFIC PLAN, [1] REVISING THE OVERLAY BOUNDARY TO ADD APPROXIMATELY 24.9 ACRES, COMPRISING OF THE PROPERTY LOCATED AT 4000 ONTARIO CENTER PARKWAY, TO THE OVERLAY AREA, [2] CHANGING THE LAND USE DESIGNATION ON APPROXIMATELY 4.9 ACRES OF LAND FROM OFFICE AND ENTERTAINMENT/RETAIL TO MIXED USE, IN AN AREA BOUNDED BY FOURTH STREET TO THE NORTH, CONCOURS STREET AND ONTARIO CENTER PARKWAY TO THE SOUTH, VIA ALBA TO THE EAST, AND THE CAMDEN LANDMARK APARTMENTS AND VACANT LAND TO THE WEST, [3] ESTABLISH DEVELOPMENT STANDARDS AND DESIGN GUIDELINES FOR THE MIXED USE LAND USE AREA WITHIN THE PIEMONTE OVERLAY AT ONTARIO CENTER SPECIFIC PLAN, AND MAKING FINDINGS IN SUPPORT THEREOF—APNS: 0210-204-12, 0210-204-13, 0210-204-14, 0210-204-15, 0210-204-17, 0210-204-18, 0210-204-20, 0210-204-21, 0210-204-22, 0210-204-23, 0210-204-23, 0210-204-24, 0210-204-25, 0210-204-26, 0210-204-28, 0210-204-36, 0210-204-37, 0210-204-37, 0210-204-38, 0210-204-39, 0210-204-40, 0210-204-41, 0210-531-06, 0210-531-07, 0210-531-08, 0210-531-09, 0210-531-10, 0210-231-11, 0210-231-12, 0210-231-13, 0210-231-14, 0210-231-15, 0210-231-16, 0210-205-01.

WHEREAS, the City of Ontario (hereinafter referred to as "Applicant") has initiated a Specific Plan Amendment, File No. PSPA21-001, as described in the title of this Resolution (hereinafter referred to as "Application" or "Project"); and

WHEREAS, the Application applies to 119.8 acres of land generally located at the northerly boundary of the City of Ontario, south of Fourth Street, east of Haven Avenue, west of Milliken Avenue, and north of Concours Street, within the Piemonte Overlay at the Ontario Center Specific Plan zoning district, and is presently improved with commercial, office, hotel, Arena, and vacant land; and

WHEREAS, Fourth Street forms the project site’s north boundary and is the corporate boundary dividing the cities of Ontario and Rancho Cucamonga. The properties to the north of the Project site are developed with industrial, residential, and commercial uses. The properties to the east are within the Ontario Center Specific Plan zoning district and is developed with commercial uses. The properties to the south are within the Ontario Center Specific Plan zoning district, and are developed with office, commercial, open space, and vacant land uses. The properties to the west are within the Ontario Center Specific Plan zoning district, and are developed with residential and commercial uses; and

WHEREAS, on March 23, 2006, City Council adopted Resolution No. 2006-11, approving the creation of the Piemonte Overlay at the Ontario Center Specific Plan within the Urban Commercial land use district of the Ontario Center Specific Plan (File No. PSPA05-003), establishing a master plan for the development of 84 acres of land, which was the former 800-acre Ontario Motor Speedway. The racing facility was completed in 1970 and closed approximately 10 years later. The facility was razed in 1981 and remained vacant until 2006, following the approval of the Piemonte at the Ontario Center Project, which established the Piemonte Overlay, allowing for the development of approximately 1.3 million square feet of retail, office, hotel, and entertainment uses, and more than 800 multiple-family dwelling units on the project site; and

WHEREAS, on May 16, 2017, City Council adopted Resolution No. 2017-041, approving an Amendment to the Piemonte Overlay of the Ontario Center Specific Plan (File No. PSPA16-003) to reduce the development intensity of the project area, designate plaza areas, and expand the design concept to include more contemporary architectural design concepts; and

WHEREAS, on June 2, 2020, City Council adopted Resolution No. 2020-065, approving and Amendment to the Piemonte Overlay at the Ontario Center Specific Plan within the Urban Commercial land use district of the Ontario Center Specific Plan (File No. PSPA19-009) to allow required residential parking to be provided as tandem parking spaces; and

WHEREAS, the Ontario Center Specific Plan Environmental Impact Report (State Clearinghouse No. 89041009) was certified on March 19, 1991, (hereinafter referred to as “Certified EIR”), in which development and use of the Project site was discussed; and

WHEREAS, a Mitigated Negative Declaration was adopted on May 16, 2017, (hereinafter referred to as “MND”), in association with an Amendment to the Ontario Center Specific Plan (File No. PSPA16-003); and

WHEREAS, the Planning Director of the City of Ontario prepared and approved for attachment to the certified Environmental Impact Report and adopted MND, an Addendum to the Certified EIR (hereinafter referred to as “EIR Addendum”) in accordance with the requirements of the California Environmental Quality Act of 1970, together with State and local guidelines implementing said Act, all as amended to date (collectively referred to as “CEQA”); and

WHEREAS, the environmental impacts of this project were thoroughly analyzed in the EIR Addendum, which concluded that implementation of the Project could result in a number of significant effects on the environment that were previously analyzed in the Certified EIR, and that the Certified EIR identified mitigation measures that would reduce each of those significant effects to a less-than-significant level; and

WHEREAS, the City's "Local Guidelines for the Implementation of the California Environmental Quality Act (CEQA)" provide for the use of a single environmental assessment in situations where the impacts of subsequent projects are adequately analyzed; and

WHEREAS, the Application is a project pursuant to the California Environmental Quality Act — Public Resources Code Section 21000 et seq. — (hereinafter referred to as "CEQA") and an EIR Addendum has been prepared to determine possible environmental impacts; and

WHEREAS, Ontario Development Code Table 2.02-1 (Review Matrix) grants the City Council the responsibility and authority to review and act on the subject Application; and

WHEREAS, the Project has been reviewed for consistency with the Housing Element of the Policy Plan component of The Ontario Plan, as State Housing Element law (as prescribed in Government Code Sections 65580 through 65589.8) requires that development projects must be consistent with the Housing Element, if upon consideration of all its aspects, it is found to further the purposes, principals, goals, and policies of the Housing Element; and

WHEREAS, the Project is located within the Airport Influence Area of Ontario International Airport, which encompasses lands within parts of San Bernardino, Riverside, and Los Angeles Counties, and is subject to, and must be consistent with, the policies and criteria set forth in the Ontario International Airport Land Use Compatibility Plan ("ALUCP"), which applies only to jurisdictions within San Bernardino County, and addresses the noise, safety, airspace protection, and overflight impacts of current and future airport activity; and

WHEREAS, City of Ontario Development Code Division 2.03 (Public Hearings) prescribes the manner in which public notification shall be provided and hearing procedures to be followed, and all such notifications and procedures have been completed; and

WHEREAS, on March 22, 2022, the Planning Commission of the City of Ontario conducted a hearing to consider the EIR Addendum and the Project, and concluded said hearing on that date, voting to issue Resolution No. PC22-014, recommending the City Council adopt the EIR Addendum, and voting to issue Resolution No. PC22-015, recommending the City Council approve the Application; and

WHEREAS, as the first action on the Project, on April 19, 2022, the City Council issued a Resolution adopting the EIR Addendum, finding that the proposed Project introduces no new significant environmental impacts and applying all previously adopted mitigation measures to the Project, which were incorporated by reference; and

WHEREAS, on April 19, 2022, the City Council of the City of Ontario conducted a hearing to consider the Project, and concluded said hearing on that date; and

WHEREAS, all legal prerequisites to the adoption of this Resolution have occurred.

NOW, THEREFORE, IT IS HEREBY FOUND, DETERMINED, AND RESOLVED by the City Council of the City of Ontario, as follows:

SECTION 1. ***Housing Element Compliance.*** Pursuant to the requirements of California Government Code Chapter 3, Article 10.6, commencing with Section 65580, as the decision-making body for the Project, the City Council finds that based upon the facts and information contained in the Application and supporting documentation, at the time of Project implementation, the project is consistent with the Housing Element of the Policy Plan (General Plan) component of The Ontario Plan. The project site contains four properties listed in the Available Land Inventory contained in Table A-3 (Available Land by Planning Area) of the Housing Element Technical Report Appendix. The proposed changes affect two of the four properties listed in the Available Land Inventory (Subareas 8 and 11; Map ID No. 124 and 125). The residential capacity proposed in this Project is consistent with the number of dwelling units (198) and density (48 DU/AC) specified in the Available Land Inventory.

SECTION 2. ***Ontario International Airport Land Use Compatibility Plan ("ALUCP") Compliance.*** The California State Aeronautics Act (Public Utilities Code Section 21670 et seq.) requires that an Airport Land Use Compatibility Plan be prepared for all public use airports in the State; and requires that local land use plans and individual development proposals must be consistent with the policies set forth in the adopted Airport Land Use Compatibility Plan. On April 19, 2011, the City Council of the City of Ontario approved and adopted the Ontario International Airport Land use Compatibility Plan ("ALUCP"), establishing the Airport Influence Area for Ontario International Airport ("ONT"), which encompasses lands within parts of San Bernardino, Riverside, and Los Angeles Counties, and limits future land uses and development within the Airport Influence Area, as they relate to noise, safety, airspace protection, and overflight impacts of current and future airport activity. As the decision-making body for the Project, the City Council has reviewed and considered the facts and information contained in the Application and supporting documentation against the ALUCP compatibility factors, including [1] Safety Criteria (ALUCP Table 2-2) and Safety Zones (ALUCP Map 2-2), [2] Noise Criteria (ALUCP Table 2-3) and Noise Impact Zones (ALUCP Map 2-3), [3] Airspace protection Zones (ALUCP Map 2-4), and [4] Overflight Notification Zones (ALUCP Map 2-5). As a result, the City Council, therefore, finds and determines that the Project, when implemented in conjunction with the conditions of approval, will be consistent with the policies and criteria set forth within the ALUCP.

SECTION 3. ***Concluding Facts and Reasons.*** Based upon the substantial evidence presented to the City Council during the above-referenced hearing, and upon the specific findings set forth in Sections 1 and 2, above, the City Council hereby concludes as follows:

(1) ***The proposed Specific Plan, or amendment thereto, is consistent with the goals, policies, plans and exhibits of the Vision, Policy Plan (General Plan), and City Council Priorities components of The Ontario Plan.*** The proposed Specific Plan Amendment is consistent with the Vision, Policy Plan (General Plan), and City Council Priorities components of The Ontario Plan, in that the Specific Plan Amendment contributes toward the legislative framework for the implementation of The Ontario Plan components, guiding growth and development within the project area to achieve optimum results from the City's physical, economic, environmental, and human resources.

(2) ***The proposed Specific Plan, or amendment thereto, would not be detrimental to the public interest, health, safety, convenience, or general welfare of the City.*** The development standards and guidelines established by the proposed Specific Plan Amendment have been created with the intent to safeguard and further the public interest, health, safety, convenience, and/or general welfare, and to ensure that the purposes of The Ontario Plan and the proposed Specific Plan Amendment, are maintained.

(3) ***The proposed Specific Plan Amendment will not adversely affect the harmonious relationship with adjacent properties and land uses.*** The location of the proposed Specific Plan Amendment, and the proposed conditions under which future developments will be constructed and maintained, is consistent with the Policy Plan component of The Ontario Plan and the City's Development Plan, and, therefore, will not adversely affect the harmonious relationship with adjacent properties and land uses.

(4) ***In the case of an application affecting specific properties, the subject site is physically suitable, including, but not limited to, parcel size, shape, access, and availability of utilities, for the request and anticipated development.*** The proposed Specific Plan Amendment has been reviewed by all City departments, which have established that the project site is physically suitable for the anticipated development in terms of parcel size, shape, and availability of utilities.

SECTION 4. ***City Council Action.*** Based upon the findings and conclusions set forth in Sections 1 through 3, above, the City Council hereby APPROVES the herein described Application, included as "Attachment A" of this resolution and incorporated herein by this reference.

SECTION 5. ***Indemnification.*** The Applicant shall agree to defend, indemnify and hold harmless, the City of Ontario or its agents, officers, and employees from any claim, action or proceeding against the City of Ontario or its agents, officers or employees to attack, set aside, void, or annul this approval. The City of Ontario shall promptly notify the applicant of any such claim, action, or proceeding, and the City of Ontario shall cooperate fully in the defense.

SECTION 6. ***Custodian of Records.*** The documents and materials that constitute the record of proceedings on which these findings have been based are located at the City of Ontario City Hall, 303 East "B" Street, Ontario, California 91764. The custodian for these records is the City Clerk of the City of Ontario.

The City Clerk of the City of Ontario shall certify as to the adoption of this Resolution.

PASSED, APPROVED, AND ADOPTED this 19th day of April 2022.

_____

PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO FORM:

_____
BEST, BEST & KRIEGER LLP
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. 2022- was duly passed and adopted by the City Council of the City of Ontario at their regular meeting held April 19, 2022, by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

The foregoing is the original of Resolution No. 2022- duly passed and adopted by the Ontario City Council at their regular meeting held April 19, 2022.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

ATTACHMENT A:

File No. PSPA21-001;
Amendment to Piemonte Overlay at the Ontario Center Specific Plan

(Document follows this page)

Piemonte Overlay at Ontario Center Specific Plan

Adopted February 2006

Revised June 6, 2017

Revised April 19, 2022

Ontario, California

Piemonte Overlay at Ontario Center Specific Plan

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1.0 INTRODUCTION

1.1 OVERVIEW

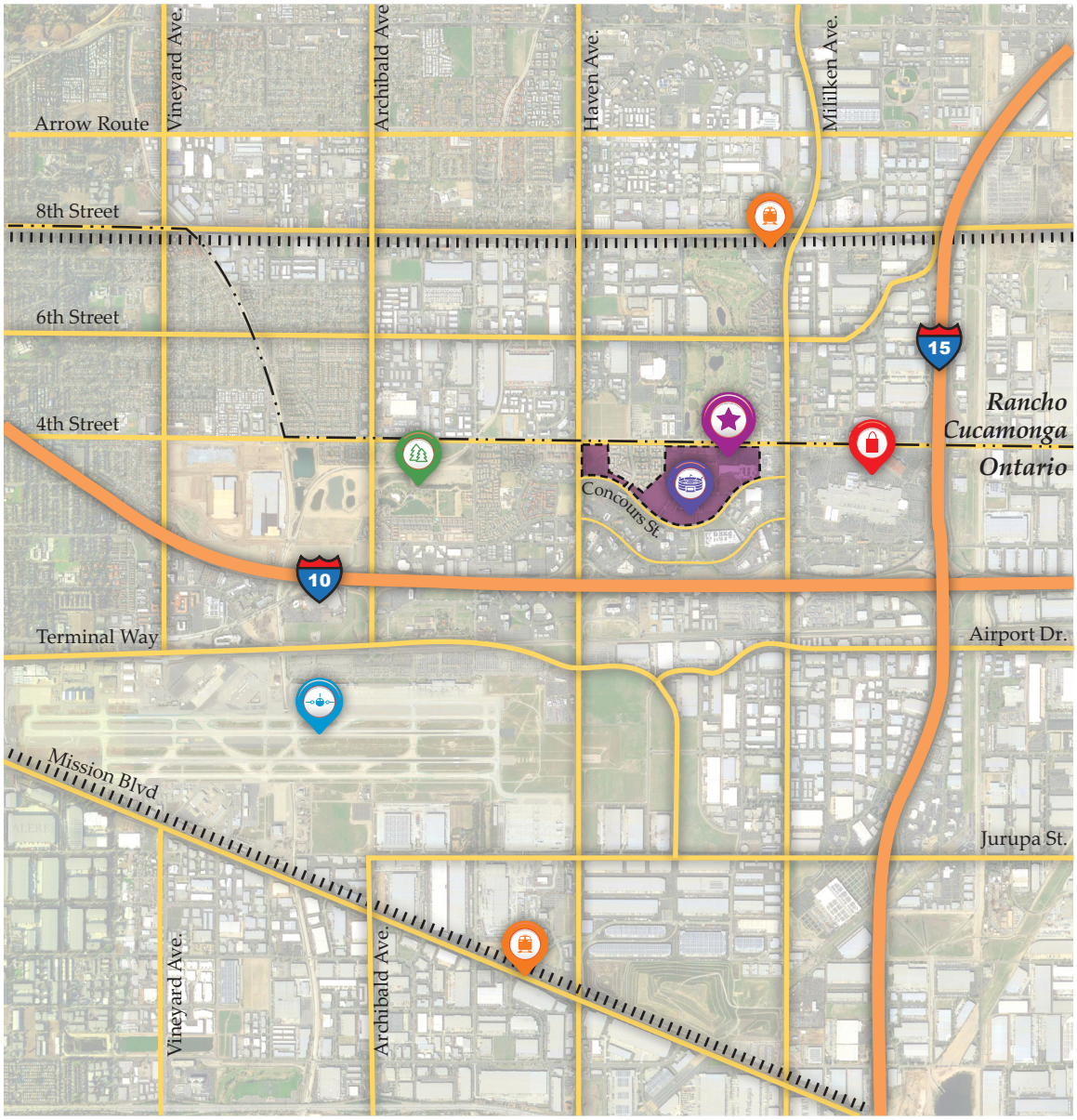
The Piemonte Overlay at Ontario Center (or "Piemonte Overlay" or "Overlay") will stimulate an urban character mixed-use development on an approximately 119.8-acre site, located within the Ontario Center Specific Plan (OCSP). Within the OCSP, the Piemonte Overlay is located south of Fourth Street, between Haven Avenue and Milliken Avenue. The regional location of the Piemonte Overlay is illustrated in Figure 1.1: Regional Location. Figure 1.2: Overlay Vicinity presents the Piemonte Overlay in its local context.

Figure 1.1: Regional Location

1.2 PURPOSE AND OBJECTIVES

The purpose of the Piemonte Overlay is to define the range of permitted uses, development regulations, requirements, and design guidelines for development within the Overlay area described below, to accomplish the following objectives:

- Provide design and development standards responding to, and reflecting, the urban characteristic elements of the Piemonte at Ontario Center;
- Implement a mix of related and mutually-supporting land uses at development intensities no greater than those identified for the OCSP;
- Provide for the orderly and master planned development of land uses within the OCSP, ensuring development of economically viable development proposals;
- Ensure development of the Piemonte Overlay area is consistent with the Ontario Plan (TOP) policies, objectives, and implementation programs;
- Provide the City of Ontario with standards for evaluation of individual development proposals within the Piemonte Overlay.



Legend

Piemonte Overlay area	Cucamonga-Guasti Regional Park
Site	Arena
Ontario Mills Mall	Interstate 10 Freeway
Metrolink Station	Interstate 15 Freeway
Ontario International Airport	

NTS

Figure 1.2: Overlay Vicinity

1.3 BACKGROUND

The City of Ontario approved the OCSP in August 1981. The OCSP, as originally approved, allowed for up to 1,530 residential units, close to seven (7) million square feet of commercial development, and nearly two (2) million square feet of industrial uses on approximately 600 acres. Several amendments to the OCSP, along with appropriate environmental review, have been approved by the City since its initial approval. Refer to Figure 1.3: OCSP Land Use Plan for the adopted land uses.

The Piemonte at Ontario Center Overlay was adopted in February of 2006 to allow a mix of urban commercial, retail, residential, and entertainment land uses on a portion of the OCSP, with a maximum of 1,292,068 square feet and 806 residential units on that portion. As such, this document serves as a Planning Area Plan, pursuant to Section 7.3 of the OCSP. In June 2017, the Piemonte at Ontario Center Overlay was amended to modify the location of the residential and non-residential development. The 2017 Specific Plan Amendment (SPA) expands the architectural and landscape themes to allow more options to ensure compatibility with existing development, to promote urban development and allow for landscape options that reduce the use of potable water and match the urban vernacular.

This 2022 Specific Plan Amendment incorporates land use and development standards focused on allowing mixed use developments in the Arena area that create a vibrant urban lifestyle.

All modifications to the OCSP have been incorporated into the body of the text, standards, and exhibits of this document. Revisions to the Design Guidelines and minor text revisions have also been completed. The prior amendments to the OCSP and the 2017 Overlay shall not be referenced for the remainder of this document.

Legend

	Boundary
	Piemonte Overlay area
	Urban Commercial (UC)
	Garden Commercial (GC)
	Urban Residential (UR)
	Open Space (OS)

NTS

Figure 1.3: OCSP Land Use Plan

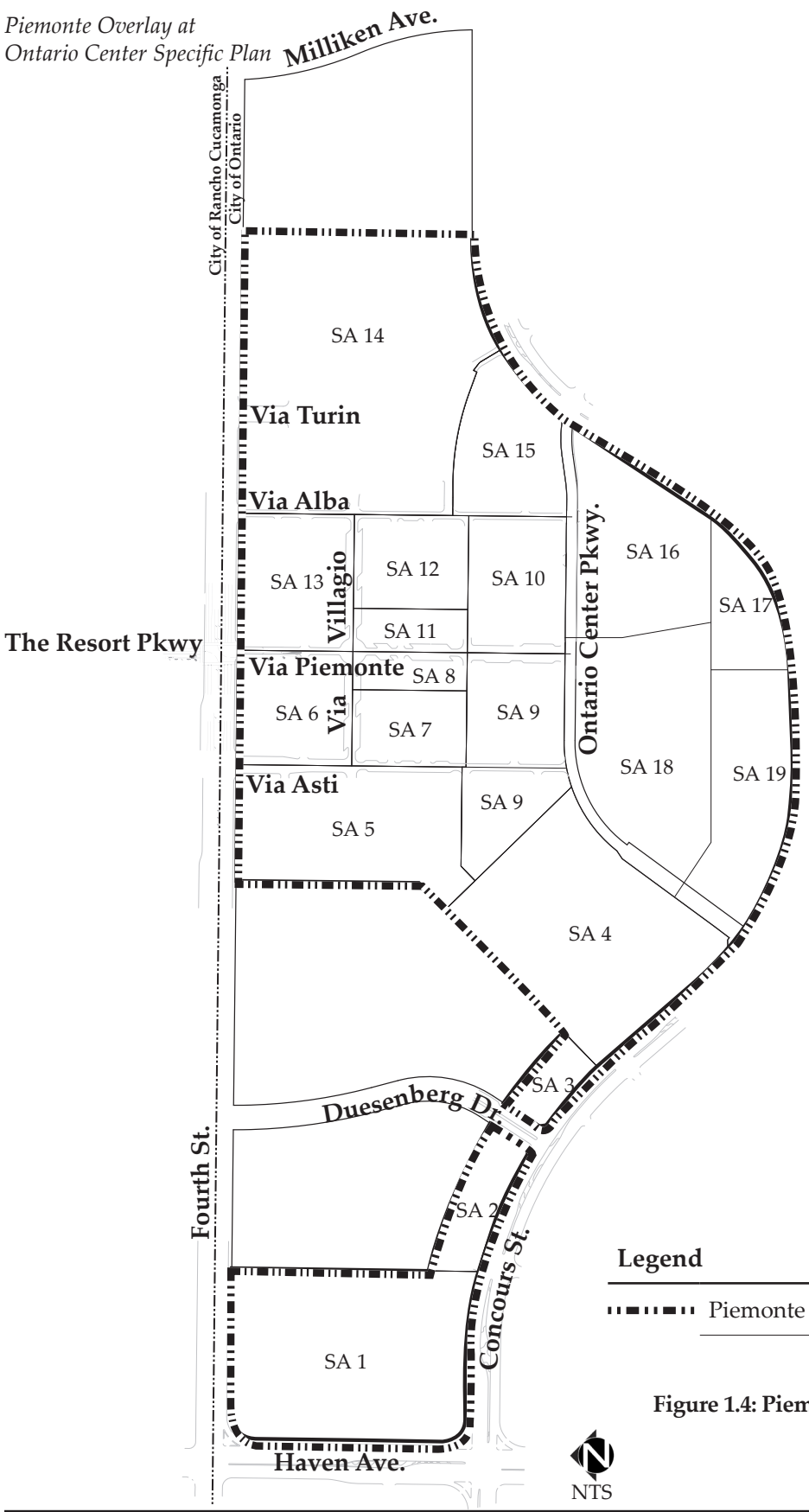


Figure 1.4: Piemonte Overlay Subareas

1.4 GOVERNING DOCUMENTS

Development of the Subareas of this Overlay is regulated by the following documents:

- The Ontario Plan (TOP) Policy Plan (General Plan) which establishes policies governing land use, circulation, housing, conservation and open space, noise, safety, and public facilities within the Specific Plan area;
- The City of Ontario Development Code, as applicable to development, where this Overlay is silent on development standards and regulations; and the subdivision of land within this Overlay area;
- The Airport Land Use Compatibility Plan of Ontario International Airport; and
- The certified Addendum to the Ontario Plan (General Plan) Environmental Impact Report.

1.5 AUTHORITY

This Overlay was prepared in accordance with California Government Code Section (Government Code) 65453 and applicable ordinances, policies, and resolutions of the City of Ontario. The City of Ontario adopts specific plans by ordinance, thereby establishing the zoning regulations for development of this Overlay.

Consistent with general requirements for Specific Plans as outlined under Government Code Article 8, this Overlay presents, or incorporates by reference, applicable regulations, conditions, and programs, which identify the following:

- The distribution, location, and extent of the uses of land, including open space, within the area covered by this Overlay;
- The proposed distribution, location, extent, and intensity of major components of public and private transportation, sewage, water, drainage, solid waste disposal, energy, and other essential facilities proposed to be located within the area covered by the plan and needed to support the land uses;
- Standards and criteria by which development will proceed, and standards for the conservation, development, and utilization of natural resources,

where applicable;

- A program of implementation measures including regulations, programs, public works projects, and financing measures necessary to carry out the development and,
- A statement of the relationship to the General Plan.

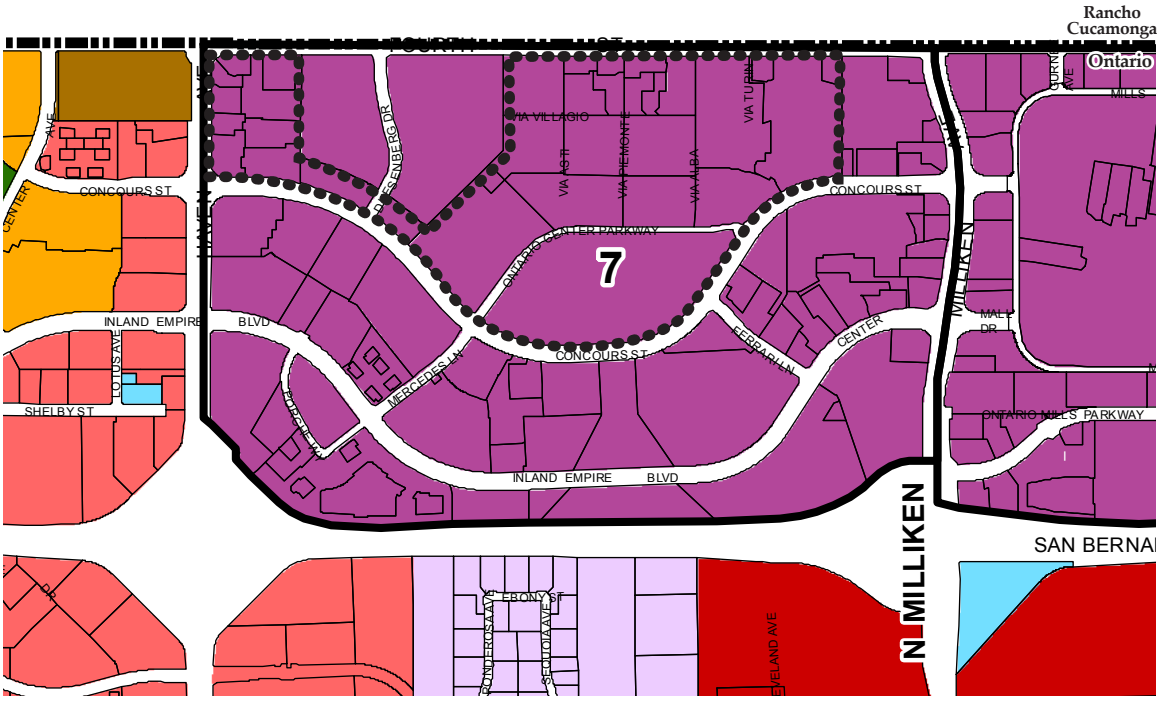
1.6. RELATIONSHIP TO THE GENERAL PLAN (POLICY PLAN) AND ZONING

The Ontario Plan (TOP) establishes the direction and vision for the City of Ontario, providing a single guidance system that will shape the Ontario community for the future. TOP provides for policies to accommodate change over a 30-year period commencing in 2010, the beginning of the planning period. TOP consists of a six part Component Framework: 1) Vision, 2) Governance Manual, 3) Policy Plan, 4) City Council Priorities, 5) Implementation, and 6) Tracking and Feedback.

This Overlay has been prepared in conformance with the goals and policies of TOP. The land use plan of TOP has identified the entire OCSP area as Mixed Use, refer to Figure 1.5: The Ontario Plan Land Use.

This Overlay implements relevant OCSP goals, principles, and standards. More specifically, the Piemonte Overlay provides for a cohesive and inter-related mix of residential and commercial/retail land uses such as is envisioned under the OCSP and TOP.

The OCSP further defines the Piemonte Overlay underlying land use and zoning as "Urban Commercial," as shown on Figure 1.3: OCSP Land Use Plan. These land use designations allow for and encourage a mix of commercial, entertainment/ retail, office, hotel, restaurant, and residential land uses as reflected on Figure 1.6: Piemonte Overlay Land Use Plan.



Legend

Piemonte Overlay area	High Density (25.1-45 du/ac)
7 Mixed Use: Ontario Center	Medium Density (11.1-25 du/ac)
General Commercial	Business Park
Office Commercial	Public Facility

NTS

Figure 1.5: The Ontario Plan Land Use

The Piemonte Overlay satisfies the following OCSP Objectives (from Section 3.1.1 of the OCSP):

- A balance of employment, shopping, and housing opportunities, reducing the need for long commutes. This Overlay provides for integrated development that includes high-density housing, commercial retail/ entertainment, restaurant uses, hotels, and office space. The mix of uses and their collocation within this Overlay provides for multiple employment, entertainment, housing, and shopping opportunities, available to residents of the Piemonte Overlay, and the greater Ontario area and surrounding region. Proximate collocation of this Overlay's mixed uses also promotes, and makes feasible, pedestrian access throughout the area, acting to reduce reliance on private automobiles. This is consistent with the intent of the OCSP to reduce dependence on private automobiles, with correlating reductions in commute distances.
- A higher density housing orientation, recognizing trends toward smaller household size. Up to 1,485 residential units can be constructed within the Piemonte Overlay. Those areas of the Overlay planned solely for residential development shall target a density of at least 25 units per acre, depending on the final site plan/unit configurations.
- A mixture of entertainment, retail and dining opportunities for OCSP users. The Piemonte Overlay provides a variety of restaurant, shopping, and entertainment opportunities. Further, integral to the Piemonte Overlay concept, is provision of a range of open space opportunities, to include enhanced and articulated streetscapes adjacent to ground-level commercial/ retail and restaurant uses.
- A looped circulation network encouraging public transit opportunities, as well as pedestrian walkways and bicycle routes. This Overlay is defined by major roadways on all sides, with connecting roadways providing access to internal parcels. Transit opportunities will be provided at key locations, consistent with transit concepts articulated within the OCSP.
- A comprehensive urban design treatment, integrating the Arena into an urban form that is both visually pleasing as well as functional. Application

of Development Standards and Design Guidelines will ensure development within this Overlay as a visually interesting and attractive component of the OCSP. Further, the Piemonte architectural and site planning concepts continue to define this Overlay area as an inter-related core destination within the City, providing residential, entertainment, business, and shopping opportunities.

The Urban Commercial land use designation provides for development of a mix of tourist-related commercial uses, high and medium-rise office buildings, entertainment/recreation clusters, and high-density residential uses in close proximity. This Overlay also establishes applicable design guidelines and development regulations for these uses.

1.7 FORMAT AND CONTENT OF THE PIEMONTE OVERLAY

Figure 1.6: Piemonte Overlay Land Use Plan designates the Land Use areas as Commercial, Mixed-use, Office, Special Use, and Residential. -Design Guidelines and Development Regulations applicable to the entire Piemonte Overlay, and specific standards that apply within each of the Land Use areas, are presented in Section 3.0. It is noted here that the predominance of facilities proposed by this Overlay will be implemented consistent with existing standards of the OCSP.

Building designs, architectural renderings, and other representations presented within this Overlay reflect the overall character, development intensity, and composition of development. These graphic portrayals and related descriptions are conceptual in nature, and may be modified as the development is further refined. Within the limits of the maximum of development intensity allowed under the OCSP, subsequent development proposals within this Overlay will be subject to design and conformance review by and through the City of Ontario.

1.7.1 Piemonte Overlay Content

Section 1.0 presents an overview of the Piemonte Overlay designation.

Section 2.0 provides a description of the Overlay, including proposed land uses, facilities, and an overview of major infrastructure systems serving the area.

Section 3.0 presents design guidelines and development regulations applicable within the Piemonte Overlay. Design guidelines and development regulations applicable to the entire Overlay Area are identified, as are the guidelines and development regulations applicable to each Land Use within the Overlay.

Section 4.0 outlines administration of the Piemonte Overlay, including review processes for individual projects prior to any physical development. Means and procedures for interpretation and application of the Piemonte Overlay, associated land uses, and design guidelines, and development regulations are also presented.

Section 5.0 describes how the Piemonte Overlay is consistent with the goals and policies of The Ontario Plan (TOP) Policy Plan (General Plan).

Appendix A of this document presents the legal description of properties subject to provisions of the Piemonte Overlay.

Appendix B is a correlation between OCSP parcel numbers and the Piemonte Overlay Subarea parcel numbers.

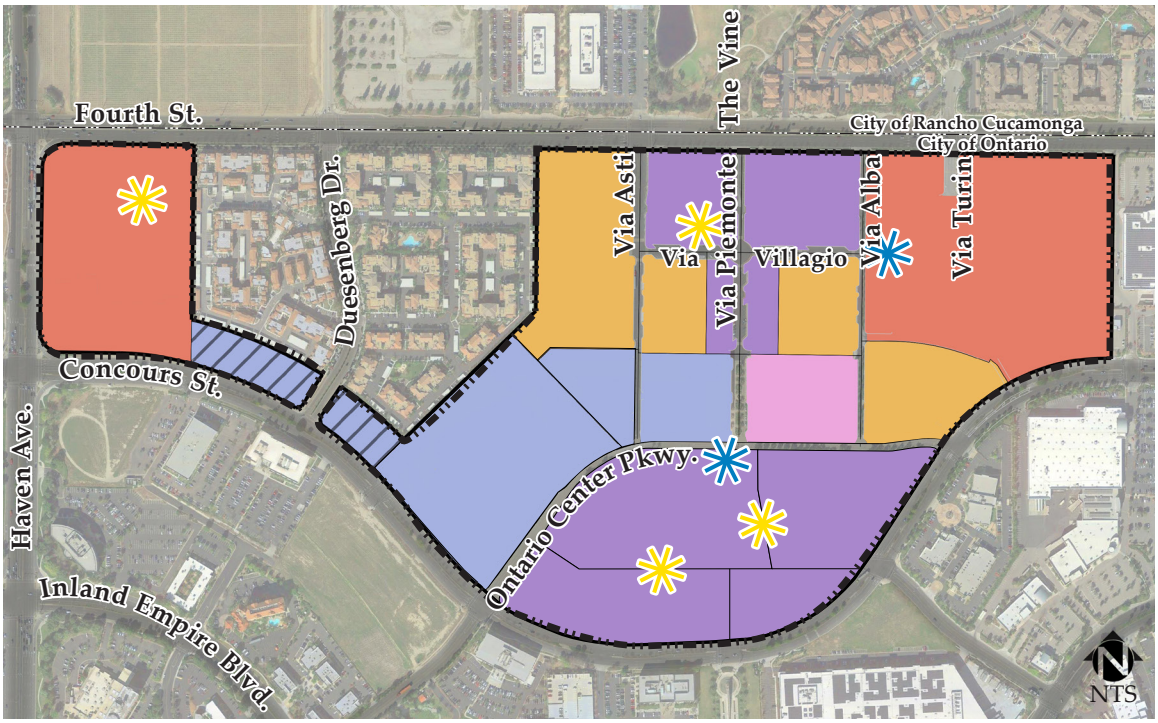
Appendix C includes the tabulation of existing development and remaining development allocation within the Piemonte Overlay.

Appendix D includes the tabulation of the development analyzed in the 2006 traffic study.

Appendix E includes a memorandum of the Piemonte trip generation comparison and the Piemonte/Empire Lakes 4th Street access configuration dated June 8, 2016.

Appendix F includes a summary of the Toyota Arena Mixed-use Development Traffice Impact Analysis dated September 17, 2021.

Appendix G includes the street tree planting matrix of the OCSP.



Legend

- Piemonte Overlay area
- Commercial
- Mixed Use
- Office
- Special Use
- Residential
- Residential Development Allowed
- Constructed Plaza
- Proposed Plaza

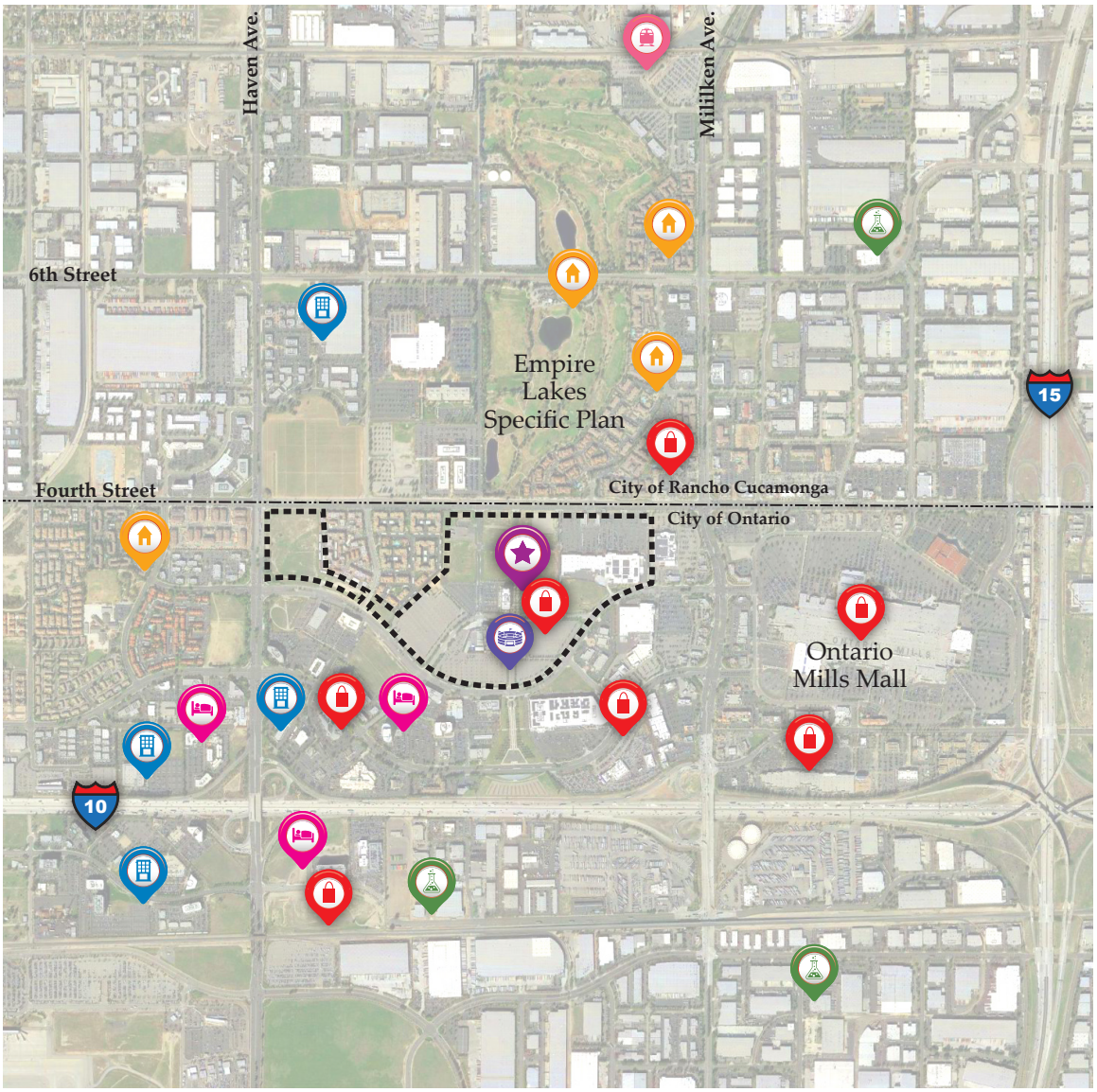
Figure 1.6: Piemonte Overlay Land Use Plan

2.0 OVERLAY DESCRIPTION

2.1 SETTING

The Piemonte Overlay consists of approximately 119.8 acres of land located at the northerly boundary of the City of Ontario, south of Fourth Street, east of Haven Avenue and west of Milliken Avenue, less than one-quarter mile north of Interstate 10 (I-10). The Piemonte Overlay is located within a rapidly developing portion of the City, and is one of the few remaining available parcels of substantial size within the OCSP.

Regional access to the Piemonte Overlay is provided by I-10 and Interstate 15 (I-15) freeways, which converge approximately one mile to the east. Local access to I-10 is provided at Milliken and Haven Avenues, and access to I-15 is available from Fourth Street. Supplementing freeway and surface street access, a Metrolink transit station is located approximately 1.5 miles northerly of the Piemonte Overlay, west of Milliken Avenue at Eighth Street.



Legend

- Piemonte Overlay area
- Site
- Commercial
- Office
- Special Use
- Residential
- Industrial
- Metrolink Station
- Arena
- Interstate 10 Freeway
- Interstate 15 Freeway

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Figure 2.1: Piemonte Overlay Context

2.1.1 Surrounding Land Uses

Figure 2.1: Piemonte Overlay Context provides an aerial view of the Overlay and surrounding land uses. Local context of the Overlay is described below.

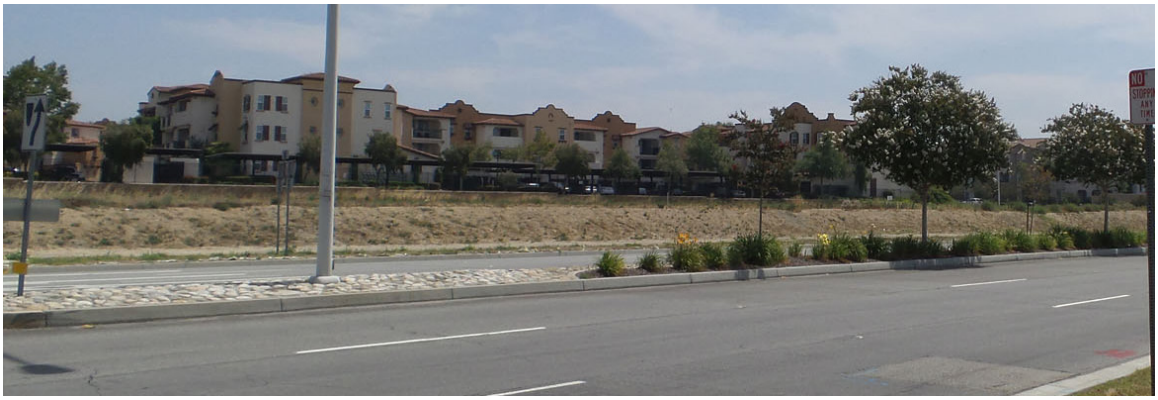
Fourth Street, which forms the site's northerly boundary, is also the jurisdictional boundary dividing the Cities of Ontario and Rancho Cucamonga. Apartments, a small retail/restaurant development and a planned residential/mixed use development are located to the north across Fourth Street, in Rancho Cucamonga.

To the east is a commercial center, anchored by a Kohl's department store, located at the southwest corner of Milliken Avenue and Fourth Street. Further to the east, across Milliken Avenue, is the Ontario Mills Shopping Center, comprised of a central mall surrounded by free-standing commercial, entertainment, and restaurant uses.

To the southeast, across Concours Street, additional existing retail uses are located adjacent to Milliken Avenue. To the south and southwest across Concours Street are office buildings.

To the west, across Haven Avenue is multi-family housing and a low-rise office/ retail complex.

In the middle of the Piemonte Overlay, and not a part of it, on both sides of Duesenberg Drive between Fourth Street and Concours Street, are the Vintage and Camden Landmark apartments.



Looking north to the Office land use from Concours Street

Looking north along Via Asti

Figure 2.2: Site Photos

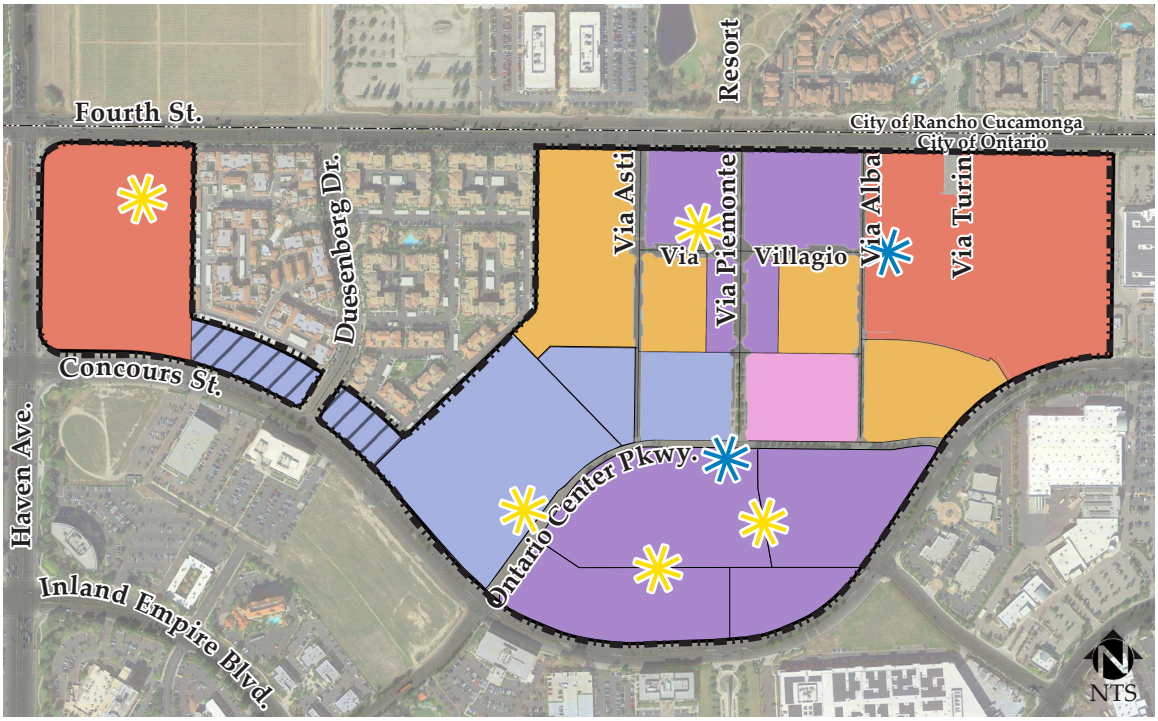
2.1.2 Ontario International Airport (ONT) Influence Area

The Airport Land Use Compatibility Plan (ALUCP) for ONT was adopted in April of 2011. The Piemonte Overlay is located within the ONT Airport Influence Area. Although the Overlay is located outside the noise and safety impact zones, the northern portion of the project site is located within the High Terrain Zone where building heights are limited to no more than 70 feet in height. Refer to ONT ALUCP for more information regarding height criteria and policies.

2.2 LAND USE AND DEVELOPMENT

2.2.1 Piemonte Land Uses and Development Components

The Piemonte Overlay Land Use designations shown on Table 2.1: OCSP Statistical Areas D & E Maximum Development allow for and encourage a mix of commercial, entertainment/retail, office, hotel, restaurant, entertainment, and residential land uses.



Legend

- Piemonte Overlay area
- Commercial
- Mixed-use
- Office
- Special Use
- Residential
- Residential Development Allowed
- Constructed Plaza
- Proposed Plaza

Figure 2.3: Piemonte Overlay Land Use Plan

2.2.2 Development Intensity

The Piemonte Overlay is located within Statistical Areas "D" and "E" of the OCSP that allows for up to 2,840,000 square feet of development intensity, including 1,606 residential units as shown in Table 2.1: OCSP Statistical Areas D & E Maximum Development. An estimated 1,457,512 square feet and 800 residential units currently exist within the Statistical Areas. See Appendix C for a list of the existing development within the OCSP Statistical Areas "D" and "E." The 2006 Overlay permitted 1,292,068 square feet of development intensity, 90,420 square feet and 15 residential units less than what is permitted under the OCSP; refer toTable 2.2: Piemonte Overlay Development Intensity Allocation by Subarea.

The 2022 Overlay Amendment proposes new development up to 879,990 SF, which is an additional 789,570 square feet (879,990 SF - 90,420 SF) added to the development intensity within Statistical Area "E", as planned under the 2016 Piemonte Overlay amendment. The total will consist of 808,790 square feet, comprising of 691 residential units and ancillary spaces, and 71,200 square feet of commercial space. Refer to Tables 2.1: OCSP Statistical Areas D & E Maximum Development, and 2.2: Piemonte Overlay Development Intensity Allocation by Subarea.

Table 2.1: OCSP Statistical Areas D & E Maximum Development

	Maximum GFA (in SF)	Maximum No. of DUs
Approved OCSP Development	2,840,000	1,606
Previously developed*	1,457,512	800**
2016 Overlay Amendment	1,292,068	806
Office/Retail	1,001,668	
Hotel 1 (236 rooms)	180,000	
Hotel 2 (100 rooms)	110,400	
Residential Units		791***
Remaining OCSP Allocation	90,420	15
2022 Overlay Amendment	879,990	691
Residential	808,790	691
Retail	71,200	

* See Appendix C for list of developed properties

** Residential units replace office/retail gross floor area (GFA) at the rate of one dwelling unit for each 600 SF of office/retail GFA (based on equivalent traffic generation, water demand, and wastewater generation rates).

*** Only 791 residential units were studied in the traffic report prepared for the 2006 Overlay

In 2016, it was anticipated that 571 dwelling units would be constructed in Subareas 5, 7, 12 and 15. In 2022, it is anticipated that construction for 691 more dwelling units will begin in Subareas 8, 11, 16 and 17. Table 2.2: Piemonte Overlay Development Intensity Allocation by Subarea demonstrates the remaining allocation by Subarea.

Table 2.2: Piemonte Overlay Development Intensity Allocation by Subarea

Sub-areas	Net Acres	Land Use					Maximum Floor Area	Maximum Dwelling Units
		Commercial	Mixed-use	Special Use (Hotel)	Offices	Residential		
1	13.02	•	•				241,429	
2*	2.28				•	•		220
3*	1.36				•	•		
4	12.35		•				251,370	
5	8.29					•		278
6	3.20		•				92,584	
7	2.68					•		61
8	0.76		•				11,047	107
9**	5.16				•		125,685	
10**	3.24			236 Rooms			180,000	
11	0.91		•				14,095	127
12	2.49					•		94
13	4.07		•				115,000	
14**	20.35	•			•		228,400	
15	4.27					•		138
16	7.46		•				25,256	359
17	2.68		•				20,802	98
18**	7.91		•				200,020	
19	6.88		•				0***	
Totals	109.36						1,505,688	1,482

*Subarea allows for residential development if it is determined by the City Council that commercial development within the subarea is not feasible, thereby allowing additional residential development at the rate of one DU for each 600 SF of available floor area.
** Built-out Subarea
*** Subarea currently improved with a parking lot. Future development plans subject to additional design and environmental review.

An approximation of comparative development intensity can be discerned by contrasting key characteristics of land uses, such as traffic generation, water demand, and wastewater generation rates. These factors are particularly appropriate since the upper limit of development intensity defined for the OCSP was founded largely on estimated roadway and water/sewer carrying capacities. Traffic generation rates and water/sewer demands of the Piemonte Overlay, as compared to traffic generation and water/sewer demands resulting from correlating maximum build-out of urban commercial uses per the adopted OCSP are summarized below and shown in

Appendix D 2006 Overlay Land Use Allocation & Maximum Development Intensity Analyzed for Traffic Generation. Please refer also to a detailed comparative analyses presented within the *Piemonte Trip Generation Comparison and the Piemonte/Empire Lakes 4th Street Access Configuration* (Fehr & Peers, June 2016) found in Appendix E.

The traffic generated by the Piemonte Overlay is significantly less than would result under build-out of the Overlay area per the maximum development intensities allowed under the OCSP, and is less than that identified in the *Piemonte at Ontario Center Project Addendum to the Ontario Center EIR* (Applied Planning, February 2006).

The development concept for the undeveloped portion of the Piemonte Overlay shown on Figure 2.4: Piemonte Overlay Development Concept is projected to generate approximately 13,905 daily trips, 957 AM peak hour trips, and 1,357 PM peak hour trips. Specifically, as demonstrated on Table 3 of the Memorandum in Appendix E, the proposed development is expected to result in 6,616 fewer daily trips, 724 fewer AM peak hour trips, and 554 fewer PM peak hour trips.

While relative traffic generation rates would be substantially reduced because of the residential component, residential uses tend to substantially increase water demands and wastewater generation rates when compared to commercial intensities on the same acreage. When considered in the context of the total Piemonte Overlay, however, the calculated incremental increases in water and sewer demands resulting from the residential land uses are offset by relatively lower development intensities realized throughout the remaining OCSP area.

Based on the preceding discussions, development intensities under the Piemonte Overlay would be less than those anticipated under the adopted OCSP. Further, related environmental effects of any Overlay development would be no greater than, and would likely be reduced, when compared to anticipated environmental effects that would result under the non-residential development of the site envisioned under the adopted OCSP.

2.2.2.1 Development Equivalency Program

In an effort to maintain flexibility to respond to changing community needs and market conditions over the build-out of Piemonte, Chapter 4 Administration provides a land use conversion process that allows additional residential units to be developed over and above the units of remaining capacity shown on the bottom of Table 2.2: Piemonte Overlay Development Intensity Allocation by Subarea by connecting 600 square feet of non-used commercial development intensity for each residential unit to be added.

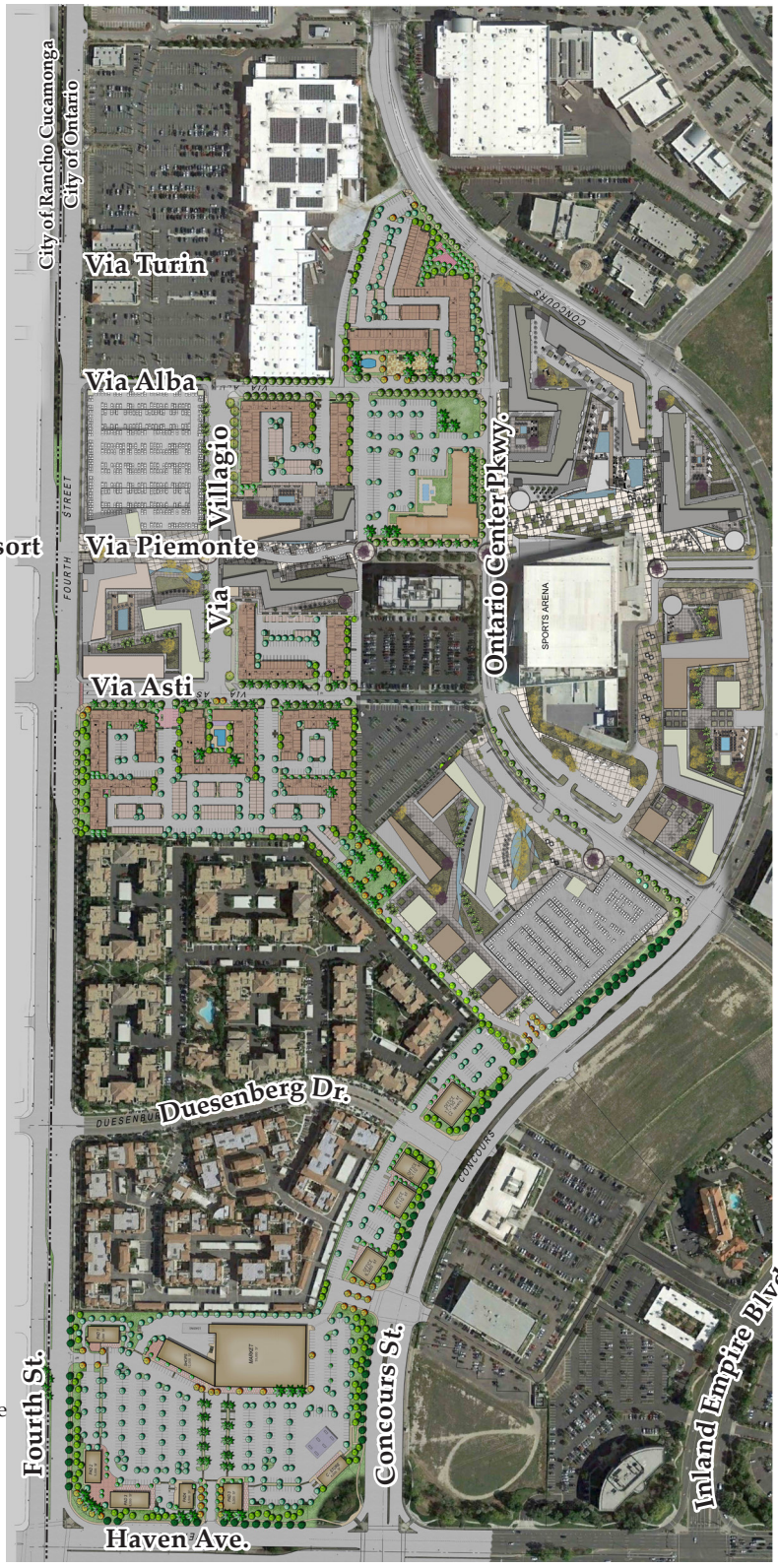
For example, assume that 479 units could be built in Subareas 2 and 3 but there is only a 220-unit remaining capacity. Therefore, 259 units (479 units - 220 units = 259 units) would have to be converted from the non-residential square footage. If the 259 units are added to residential capacity total, 155,400 square feet (259 units x 600 square feet) of the remaining development must be converted to residential using the 600-square-foot conversion factor reducing the amount of non-residential development by that same square feet. This conversion is based on equivalent traffic generation, water demand, and wastewater generation rates. This 600-square-foot conversion factor does not require individual residential units to be 600 square feet or less.

2.3 DEVELOPMENT CHARACTERISTICS

The Piemonte Overlay concept promotes interaction between residential, commercial entertainment/retail, office, and specialty land uses. To these ends, the design and composition of development will provide its residents the opportunity to live, work, shop, and take advantage of various entertainment venues without the need to drive a car. Similarly, employees and visiting patrons are provided retail, dining, and entertainment opportunities without the need for multiple trips.

2.3.1 Development Concept

The Piemonte Overlay Development Concept is illustrated in Figure 2.4: Piemonte Overlay Development Concept. The overall design concept depicts



Note: The site design represented is conceptual in nature, and exemplifies one possible design scenario that has been developed in accordance with the design criteria of the Piemonte Overlay and may not represent ultimate building layout.

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Figure 2.4: Piemonte Overlay Development Concept

a complementary, pedestrian-oriented urban development, with an emphasis on wide, landscaped sidewalks, outdoor seating and dining areas, and contemporary design elements to be employed throughout the Overlay.

The central corridor or spine is established by the north/south Via Piemonte (a private drive) that is perpendicular to Fourth Street, leading to a major open space adjacent to the Arena. Via Piemonte is anchored by a series of retail on the ground floor and residential uses above with a variety of landscape and hardscape features with a focus on pedestrian oriented activity areas. The building mass and placement along Via Piemonte will be used to create interesting spaces, and may include courtyard spaces, open plazas, outdoor seating and dining areas. The building massing will further emphasize the connection between Fourth Street and the entertainment center surrounding the Arena. In so doing, the Via Villagio development concept will provide a visually and spatially varied streetscape.

The south side of Via Villagio is designed to emphasize dining and entertainment opportunities, and will be delineated by decorative pavement and other defining landscape/hardscape treatments. This area is also designated to encourage visitors to move in a north/south direction along Via Piemonte, fostering interaction among the entertainment, dining, retail, office, hotel and Arena uses.

Via Piemonte is designed as a continuous pedestrian parkway to the Arena, providing venus for entertainment, dining, retail and public gathering along the way.

A central core area is designed to foster interaction with office and hotel uses to the south and connected by a formal pedestrian esplanade between Concours Street and Fourth Street.

The various land uses will be connected by a series of defined pedestrian walkways. Pedestrian links in the form of landscaped sidewalks have also

been designed to allow workers, residents, and visitors to move through the Piemonte Overlay, and to the Arena.

The OCSP requires three Plazas to be located within the Ontario Center area. Two Plazas have been constructed as shown on Figure 2.3: Piemonte Overlay Land Use Plan. An additional Plaza(s) will be constructed in SA1. These Plaza areas include the following elements, unless alternative designs are approved by the Planning Director:

- Minimum of 0.5 acre (could be in two separate areas).
- 50-foot minimum dimension, not including building or parking setbacks from streets, or roof overhangs, excepting entry canopies.
- Landscaping: Minimum 10 percent. The planting areas included in the landscape requirement calculations must have minimum 5 feet dimension.
- Hardscape: Maximum 80 percent.
- Other amenities, such as water features or installations that complement the plaza design: Minimum 5 percent.

Generally, Plazas are intended to provide an urban environment augmented by extensive use of shade trees and structures, such as benches, fountains, pergolas, arbors, etc.

2.4 CIRCULATION PLAN CONCEPT

A private circulation system and design standards for vehicular and pedestrian movement are established under the Piemonte Overlay. Following, are summary descriptions of both the vehicular and pedestrian circulation systems. The street sections and plans shown in this section are conceptual designs and minor modifications may be implemented in Development Plans as circulation designs are further refined.

2.4.1 Vehicular Circulation

The Vehicular Circulation Plan Concept is presented on Figure 2.5: Piemonte Overlay Circulation Plan. Primary access is provided by public roadways that border the Overlay, including Haven Avenue to the west, Concours Street to the south, and Fourth Street to the north. Within the Overlay, access to individual uses will be provided by Ontario Center Parkway and privately owned and maintained drives. Private drives also provide for necessary access/public utilities easements. Along the perimeter, public streets will accommodate public utilities improvements.

Figure 2.5: Piemonte Overlay Circulation Plan also identifies representative street cross-sections locations within, and adjacent to, the Overlay, and the cross-sections are presented in subsequent Figures. Consistent with City requirements, private drives identified within these Figures will be clearly identified on development plans, construction drawings, and property descriptions. To the satisfaction of the City Engineering Department, public access and utilities easements will be provided within private drives.

A proposed access from Fourth Street into the SA 1 will be permitted by the City Engineer if the proposed driveway is located as close as practicable to the east property line and the intersection is controlled with a traffic signal.

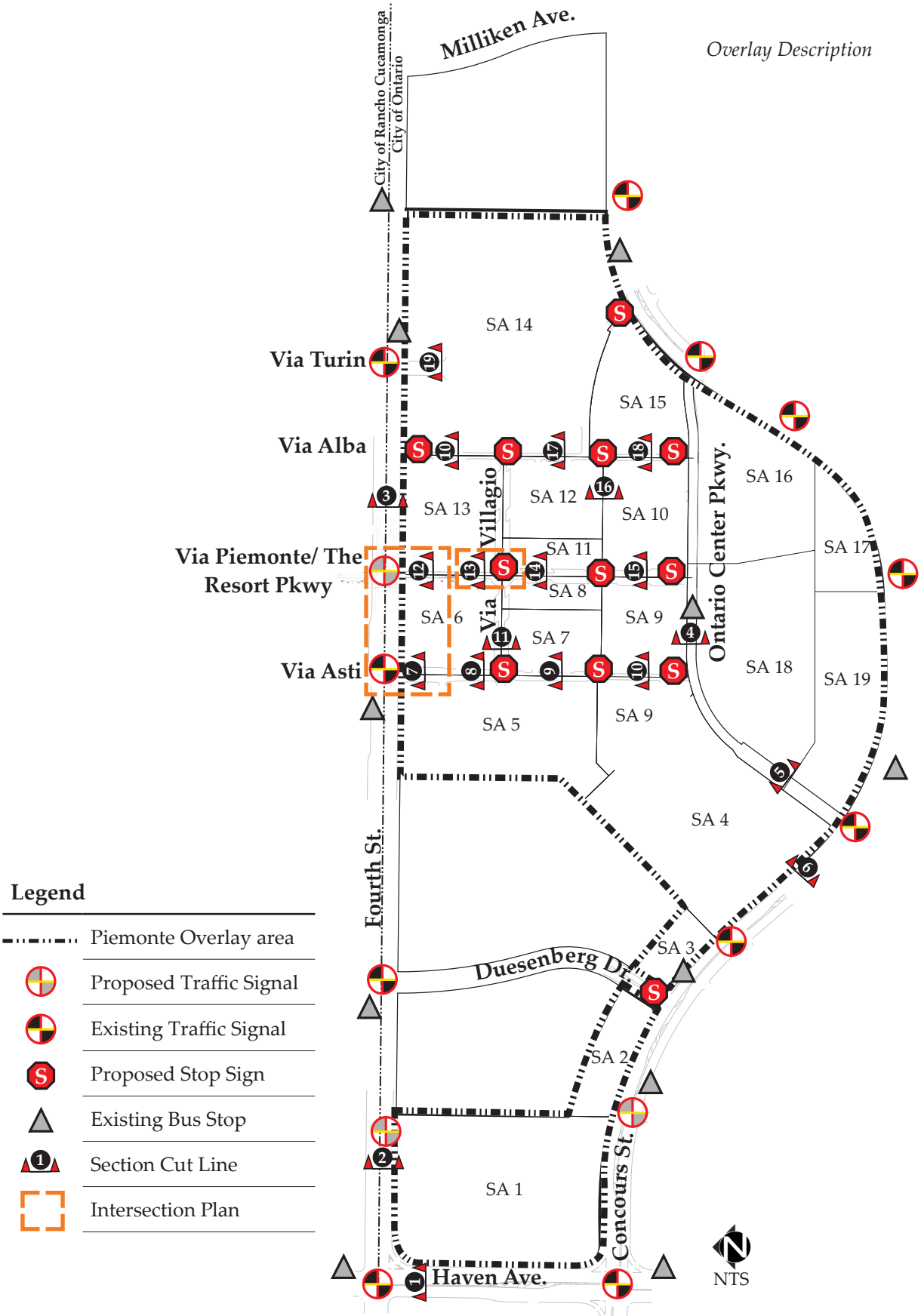
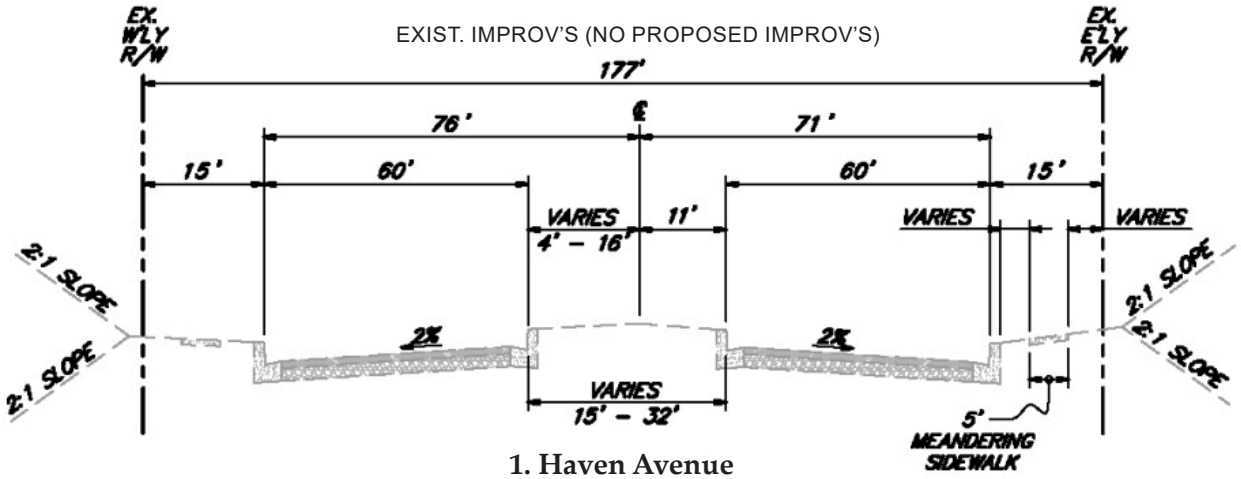
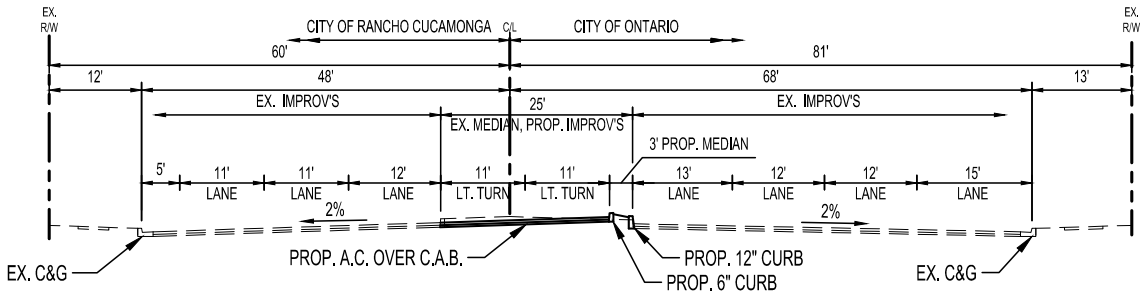


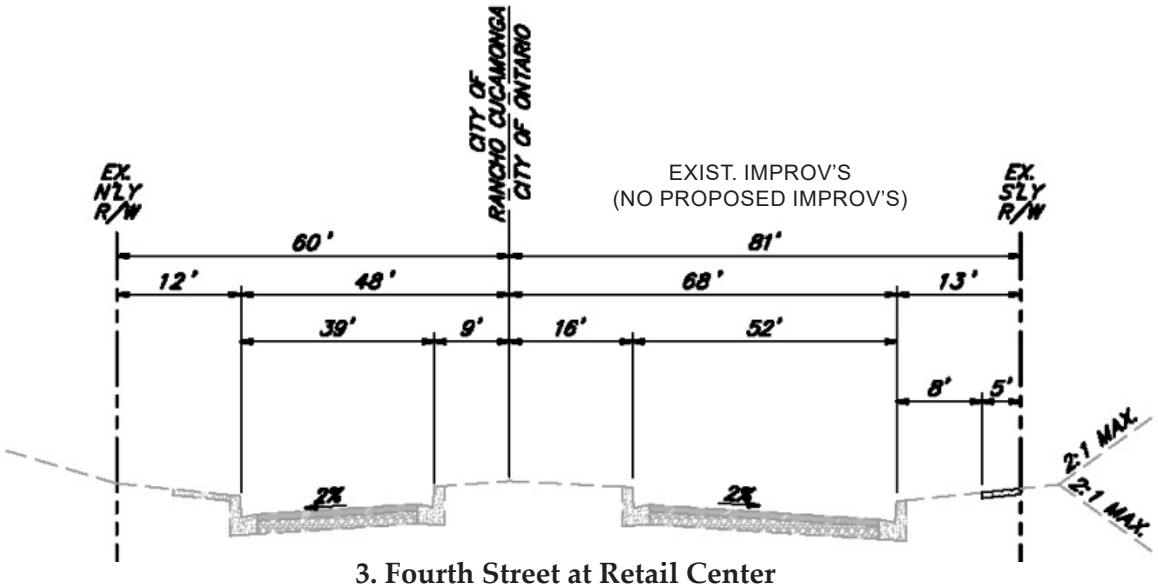
Figure 2.5: Piemonte Overlay Circulation Plan



1. Haven Avenue

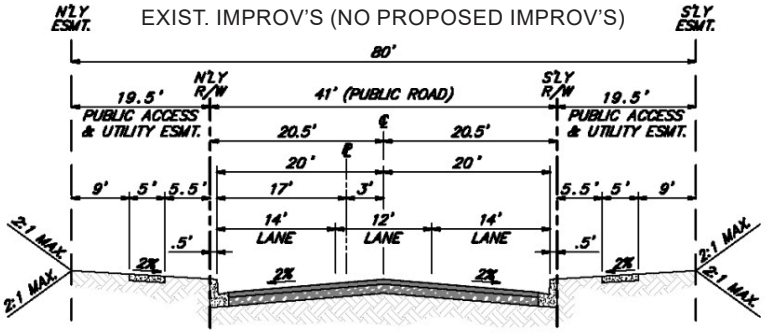


2. Fourth Street (East of Piemonte)

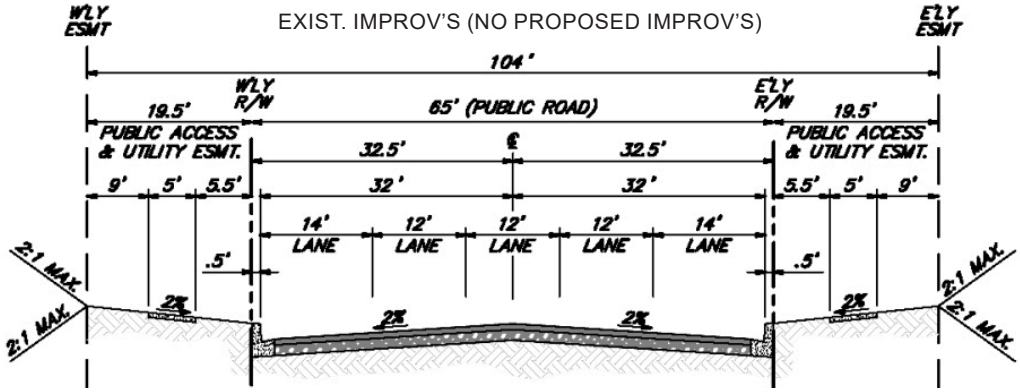


3. Fourth Street at Retail Center

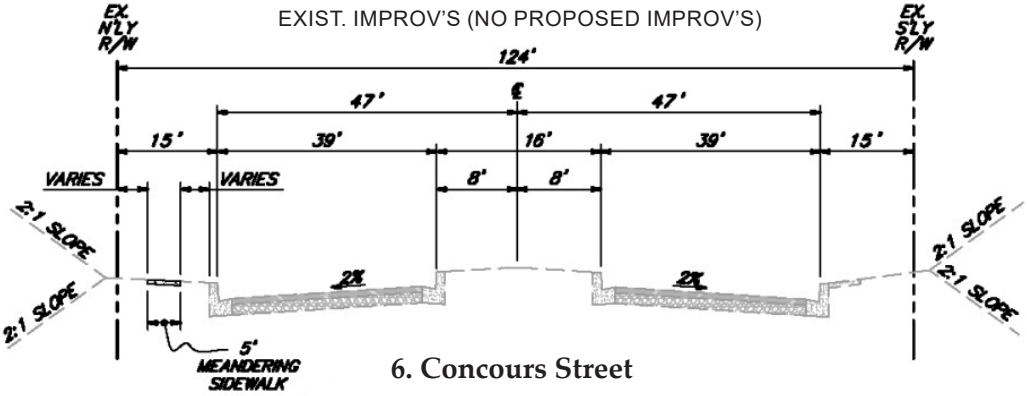
Figure 2.6a: Public Street Cross Sections



4. Ontario Center Parkway
(East of Via Asti)

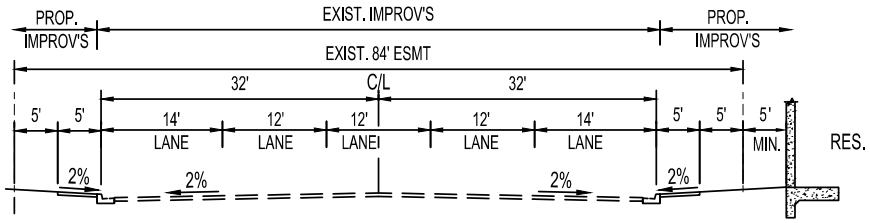


5. Ontario Center Parkway
(West of Via Asti)

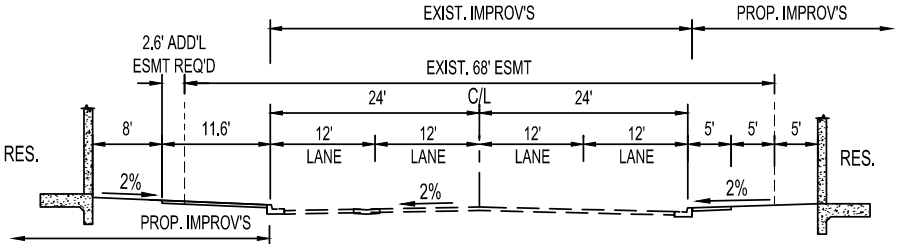


6. Concours Street

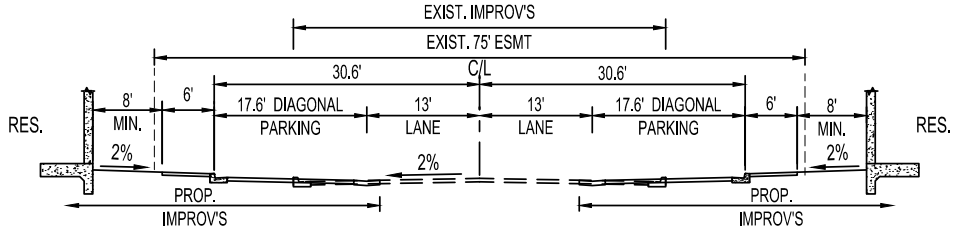
Figure 2.6b: Public Street Cross Sections



7. Via Asti - North Section (North Entrance)

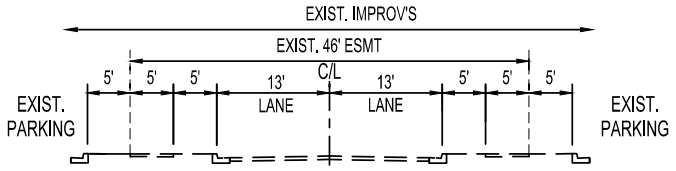


8. Via Asti - Middle Section (North of Via Villagio)

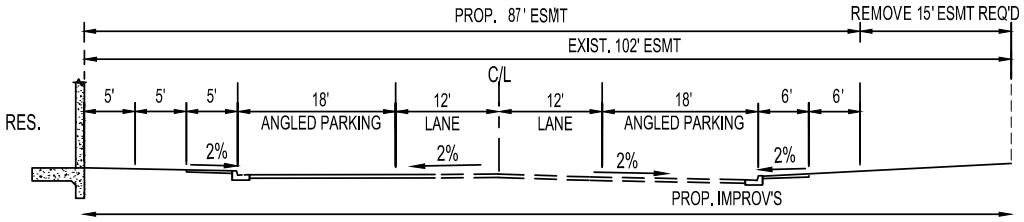


9. Via Asti - Middle Section (South of Via Villagio)

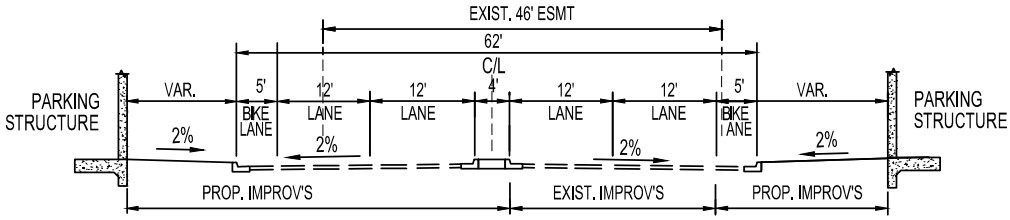
Figure 2.7a: Private Drive Cross Sections



10. Via Asti - South Section (North of Ontario Center Parkway)
Via Alba - North Section (North of Via Villagio)

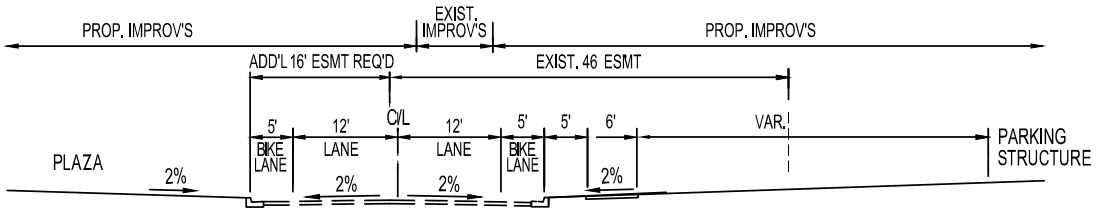


11. Via Villagio

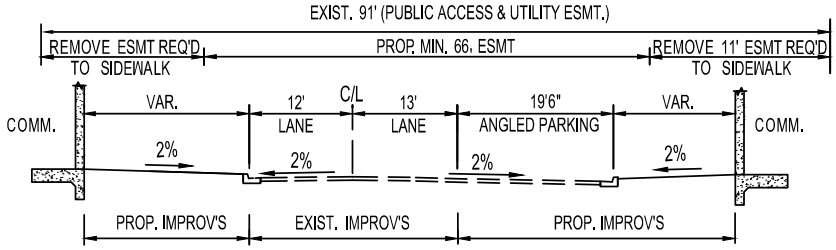


12. Via Piemonte - North Section (North Entrance)

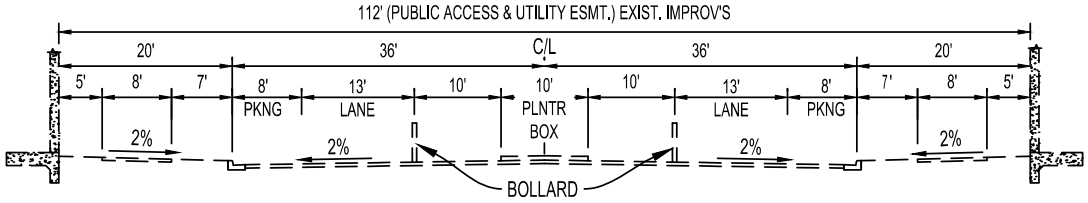
Figure 2.7b: Private Drive Cross Sections



13. Via Piemonte - North Section (North of Via Villagio)

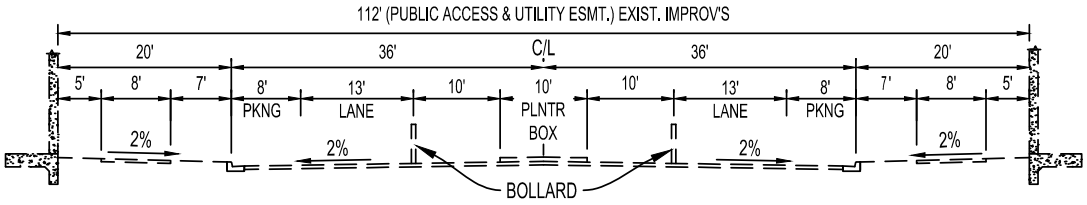


14. Via Piemonte - Middle Section (North Entrance)

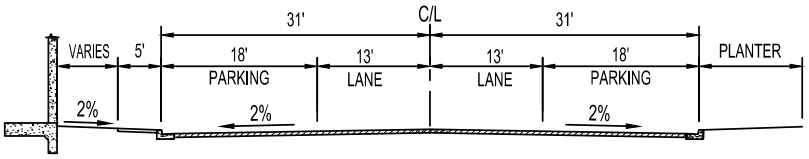


15. Via Piemonte - Middle Section (South Entrance)

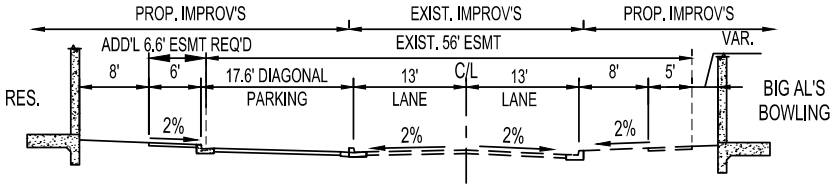
Figure 2.7c: Private Drive Cross Sections



16. Via Piemonte - South Section - (South of Via Villago)

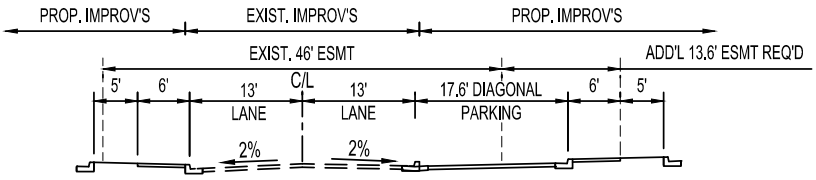


17. Shared Drive between SA 10, 11, & 12 (South of Via Villagio)

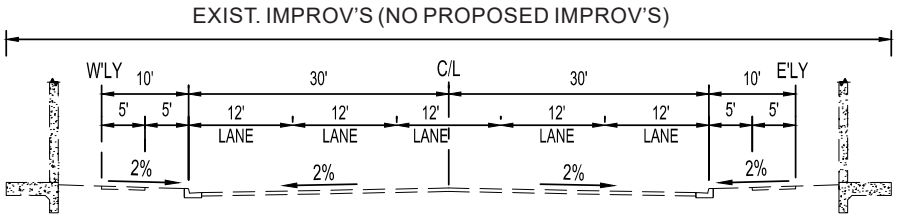


18. Via Alba - Middle Section (South of Via Villagio)

Figure 2.7d: Private Drive Cross Sections



19. Via Alba - South Section (North of Ontario Center Parkway)



20. Via Turin

Figure 2.7e: Private Drive Cross Sections

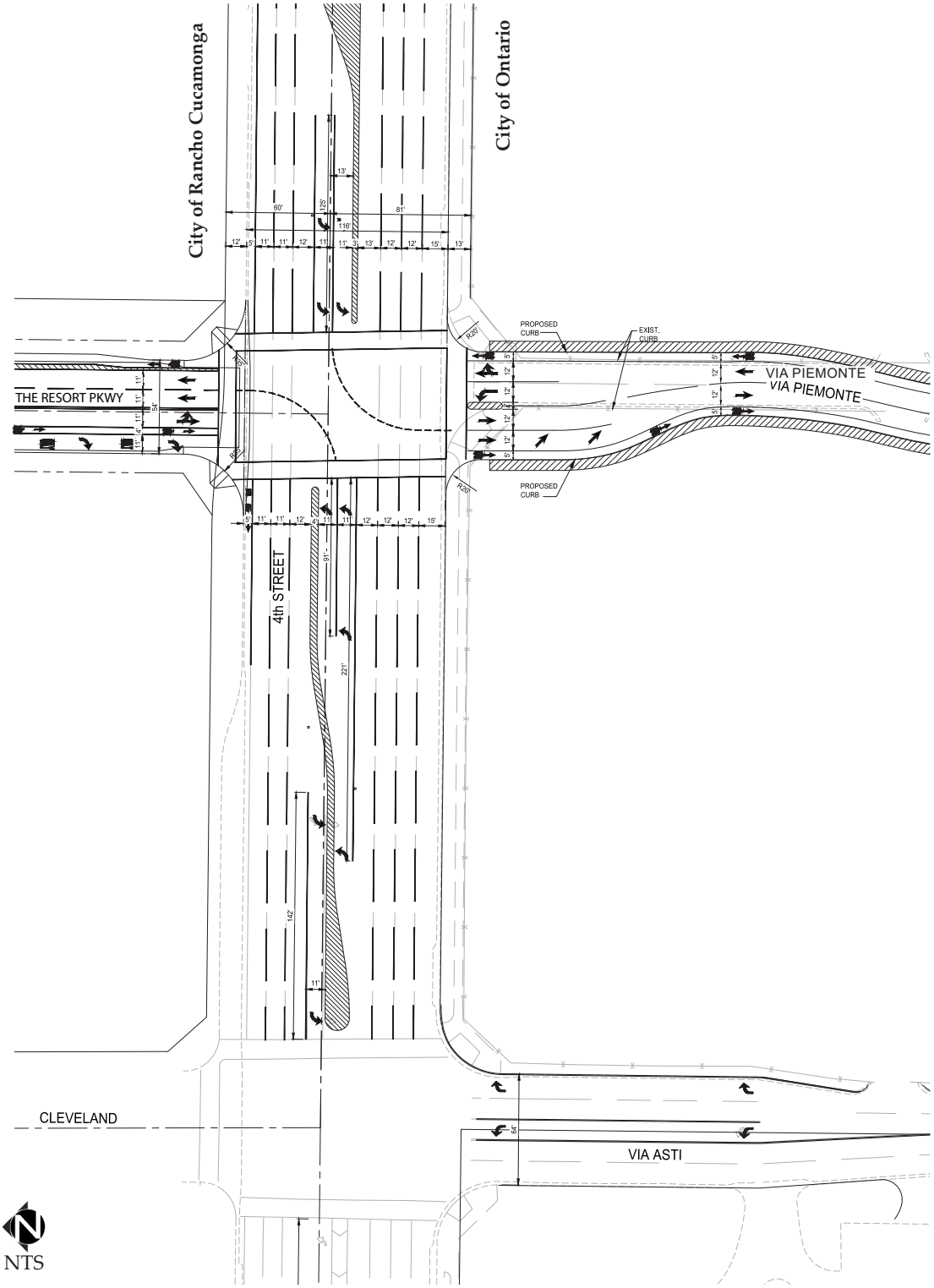


Figure 2.8a: 4th Street Intersection Plan

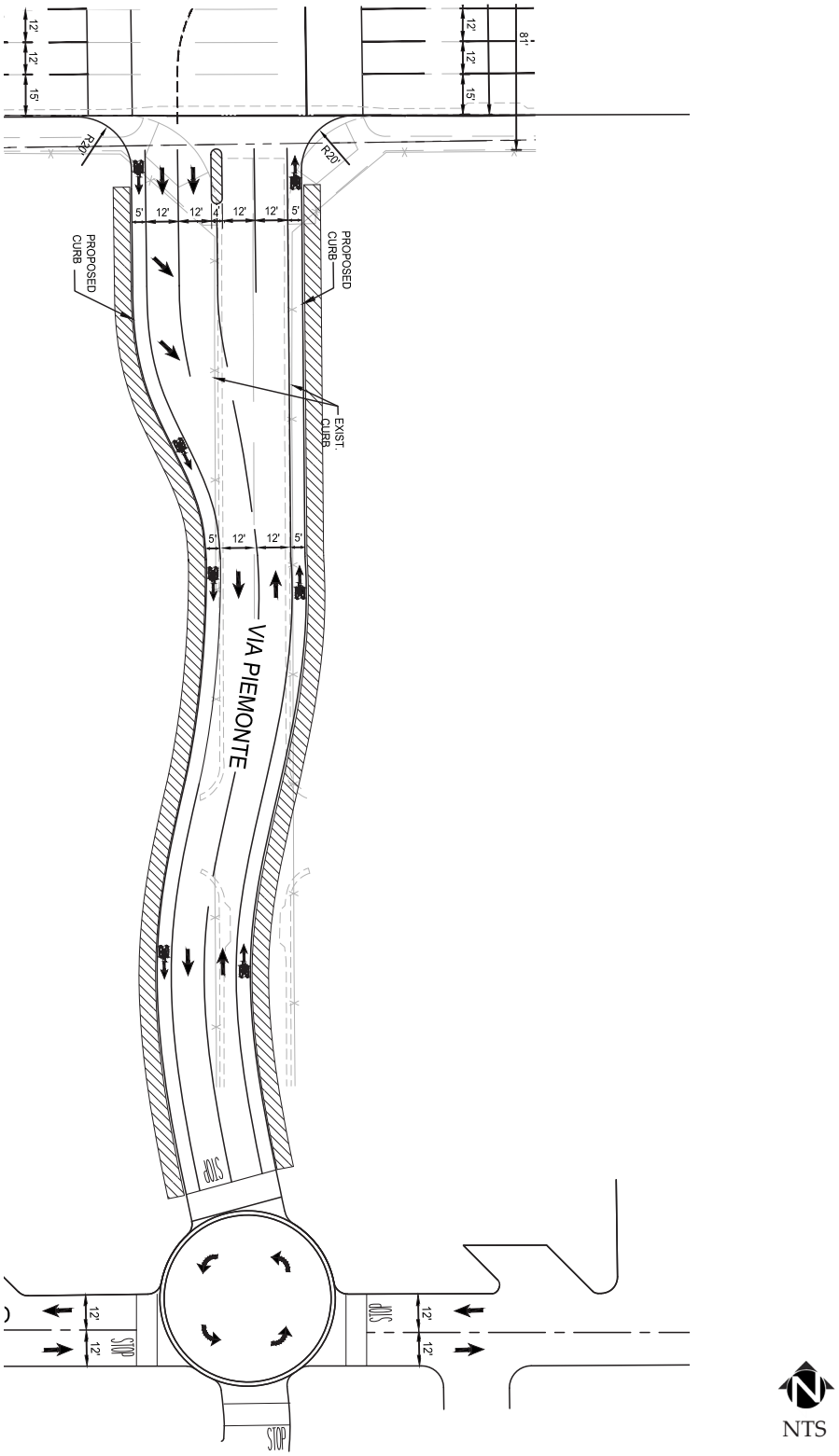


Figure 2.8b: Via Piemonte Plan (South of Fourth Street)

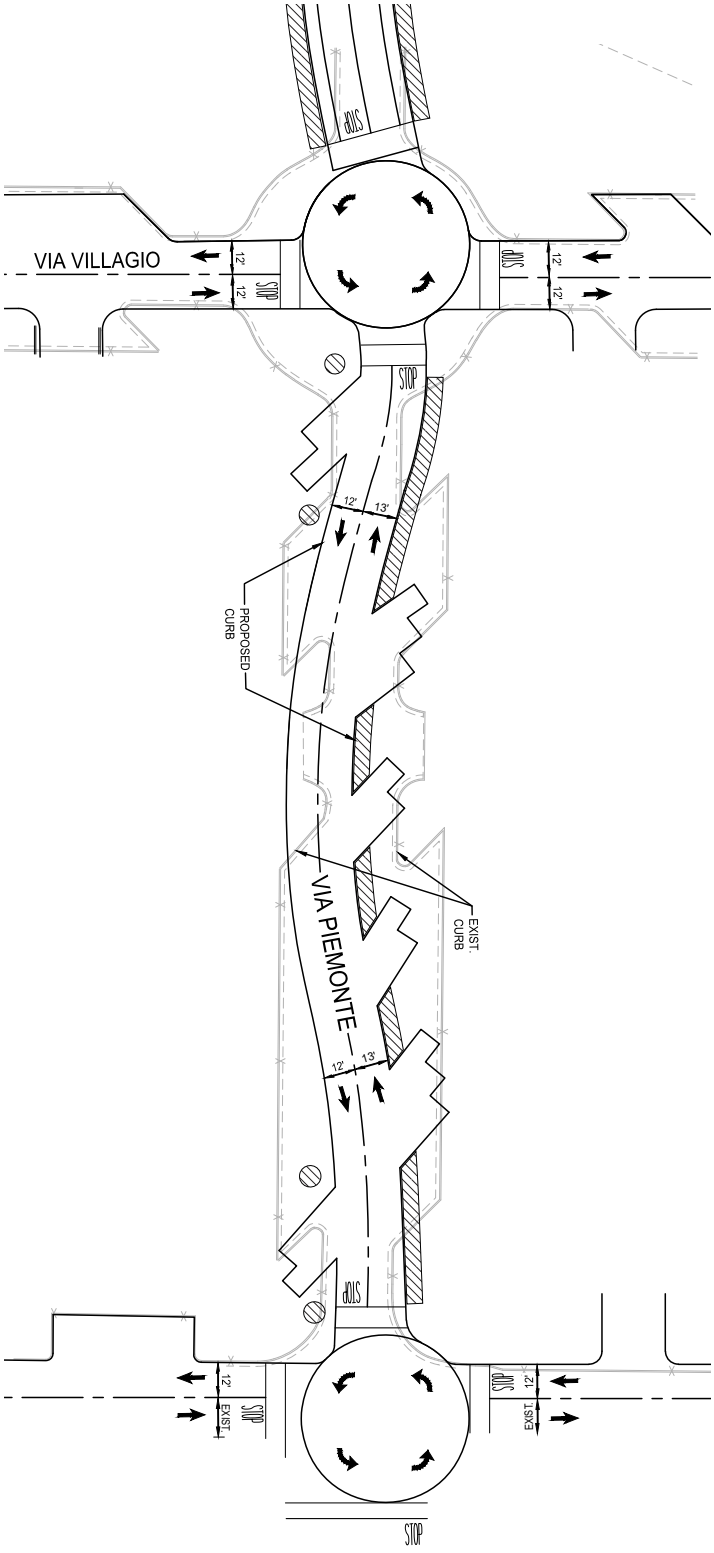


Figure 2.8c: Via Piemonte Plan (South of Via Villagio)

In addition to the typical street section described and depicted, additional right-of-way and travel lane designs may be required to adequately mitigate impacts identified in the Traffic Impact Analysis/Specific Plan EIR.

2.4.2 Pedestrian Circulation

As illustrated in Figure 2.9: Pedestrian Circulation, the Piemonte Overlay incorporates a pedestrian network which provides connections to, and supports interaction between, the various land uses. The pedestrian network largely parallels the roadway network.

The pedestrian network incorporates design features including enhanced paving/surface treatments and monumented entries. Typical pedestrian walkway enhancements in the Piemonte Overlay entries include the existing arbors/pergolas with climbing grapevines, acting to identify and define entrances, while differentiating the Overlay from surrounding urban uses. New, more urban, entries may also be provided with each development application for build-out of the residential and commercial uses. Entries will be emphasized by adjacent plantings of specimen trees. Landscaping along pedestrian walkways will typically include ornamental grasses, groundcover, and shrubs, thematically employed throughout. Walkways along public streets will be canopied by planting of adjacent street trees.

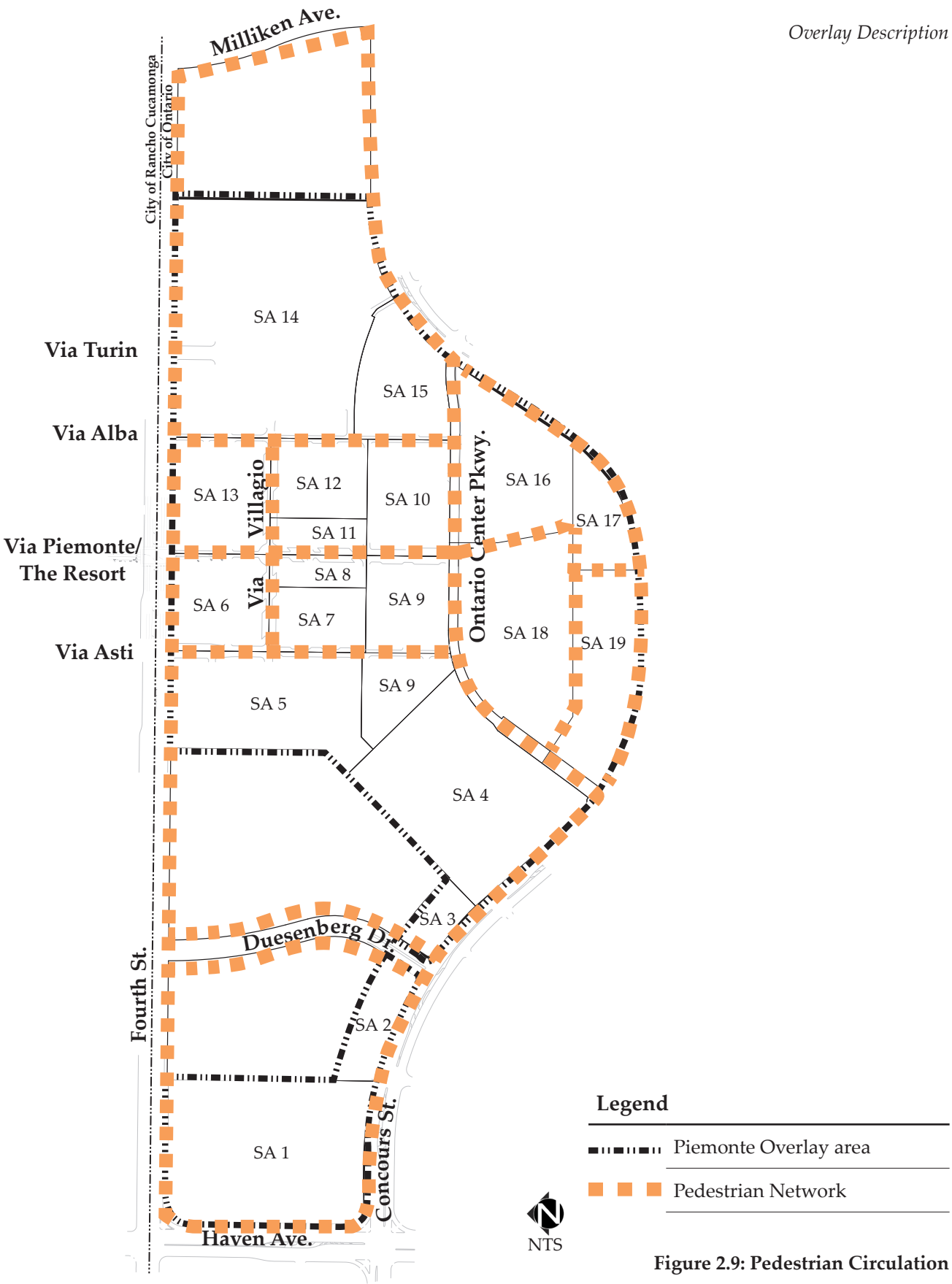


Figure 2.9: Pedestrian Circulation

2.5 LANDSCAPE CONCEPT

Figure 2.4: Piemonte Overlay Development Concept illustrates a contemporary urban landscape concept using clean simple forms, reinforcing Southern California's indoor/outdoor lifestyle, while existing monumentation (as shown in the following photos) picks up the influences of the Piemonte region of Northern Italy. Landscape patterns and street furniture will create a harmonious, functional environment. Tall trees, such as towering palms, eucalyptus, and other drought tolerant trees will act as "way-finding" features and provide appropriate scale to the vertical urban environment. Broad, spreading canopy trees will enhance and add variety to the streetscape walking experience. The multi-colored and varyingly textured understory plant material will be rich in varieties of ornamental grass, succulents, and flower groundcovers creating this semi-arid and environmentally sustainable landscape environment.

All monuments shall conform to current corner sight line and monument placement standards per City of Ontario Standard Drawing No. 1309 and the City Traffic and Transportation Guidelines, Chapter 5: Monument Placement.

Views of existing commercial at the intersection of Fourth Street and Via Turin

Looking north along Via Alba at the intersection of Via Alba and Ontario Center Parkway

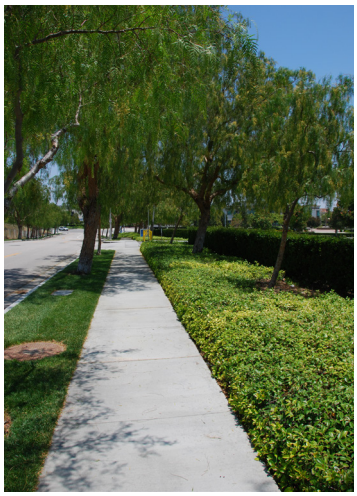
Looking north along Via Asti at the intersection of Via Asti and Ontario Center Parkway

Figure 2.10a: Photos of existing streetscape

Photos looking north along Via Piemonte at the intersection of Via Piemonte and Ontario Center Parkway

Figure 2.10b: Photos of existing streetscape

Views of streetscape along Ontario Center Parkway



Views of streetscape along Ontario Center Parkway

Views of existing residential and streetscape along Duesenberg Drive

Figure 2.10c: Photos of existing streetscape

Views of streetscape along Concours Street at central portion

Views of streetscape along Concours Street at western portion

Views of streetscape at the intersection of Haven Avenue and Concours Street

Figure 2.10d: Photos of existing streetscape

2.6 INFRASTRUCTURE

This section describes the existing backbone infrastructure system available for Piemonte Overlay development, and identifies any improvements necessary to accommodate future development in the Overlay. Please refer also to infrastructure descriptions and analyses presented within: *Piemonte Preliminary Sewer Study, Piemonte Water System Summary, Piemonte Reclaimed Water Summary*, and *Piemonte Storm Drain System Summary*, (SB&O, Inc.) January 2006 and *Feasibility Study for the Adept Development Sewer Project*, (Stantec Consulting Services Inc.) February 2022, available from the City of Ontario Planning Department. Development proposals in the Overlay area may warrant additional studies to assure adequate utility capacity, placement and design, which may differ from the information in the subsections below.

2.6.1 Wastewater

Wastewater treatment services for the City of Ontario and other nearby communities are provided by Inland Empire Utilities Agency (IEUA). This Agency is responsible for treatment of wastewater generated from development within the Overlay area. Wastewater will be transported to IEUA Regional Plant No. 1 (RP-1) via the City of Ontario wastewater collection and conveyance system. IEUA Regional Plant No. 1 is located south of the Pomona Freeway (SR-60) and west of Archibald Avenue.

The backbone sanitary sewer system and delineation of private/public sewer system components are identified in Figure 2.11: Wastewater Facilities Plan. The perimeter public streets accommodate sewer system improvements.

A 24-inch IEUA sewer interceptor exists in Fourth Street along the northerly boundary. This interceptor captures all wastewater from north of Fourth Street within Rancho Cucamonga and transfers it west along Fourth Street. Therefore, the Overlay area does not accept any off-site wastewater from the north. All wastewater flows generated within the Piemonte Overlay area are transported via 8- to 10-inch sewer lines to Concours Street. At Concours Street, these lines

are connected to the existing 8- to 12-inch sewer mains. These mains currently connect to an 18-inch main, that in turn connects to the Inland Empire Boulevard sewer main to the south.

The collection sewer main to the south of the Overlay area, originally called the Ontario Motor Speedway Outfall, was sized to handle flows from the site. This outfall line ultimately flows west along Inland Empire Boulevard, then proceeds south beneath I-10. Sanitary sewer facilities constructed south of I-10 have previously been upgraded and sized to adequately handle development within the Overlay and surrounding areas.

The existing wastewater transmission facilities within Concours Street have enough overall capacity to adequately convey wastewater generated by development based on information presented in the *Preliminary Sewer Study for Piemonte,* (SB&O, Inc.) dated January 25, 2006 (Sewer Study). The *Feasibility Study for the Adept Development Sewer Project*, (Stantec Consulting Services Inc.) February 2022 has identified some sections that will require sewer upgrades in terms of capacity and/or replacement of deteriorated infrastructure and Development Plans will be required to address these areas of concern.

It is further noted that the Sewer Study conservatively assumes 2.7 persons per dwelling unit within the Piemonte Overlay, with a calculated wastewater generation rate of 100 gpd/person, or 270 gpd/dwelling unit. The overall mix of residential units will likely result in reduced overall resident populations, with resulting reductions in wastewater generation when compared to the Sewer Study assumptions.

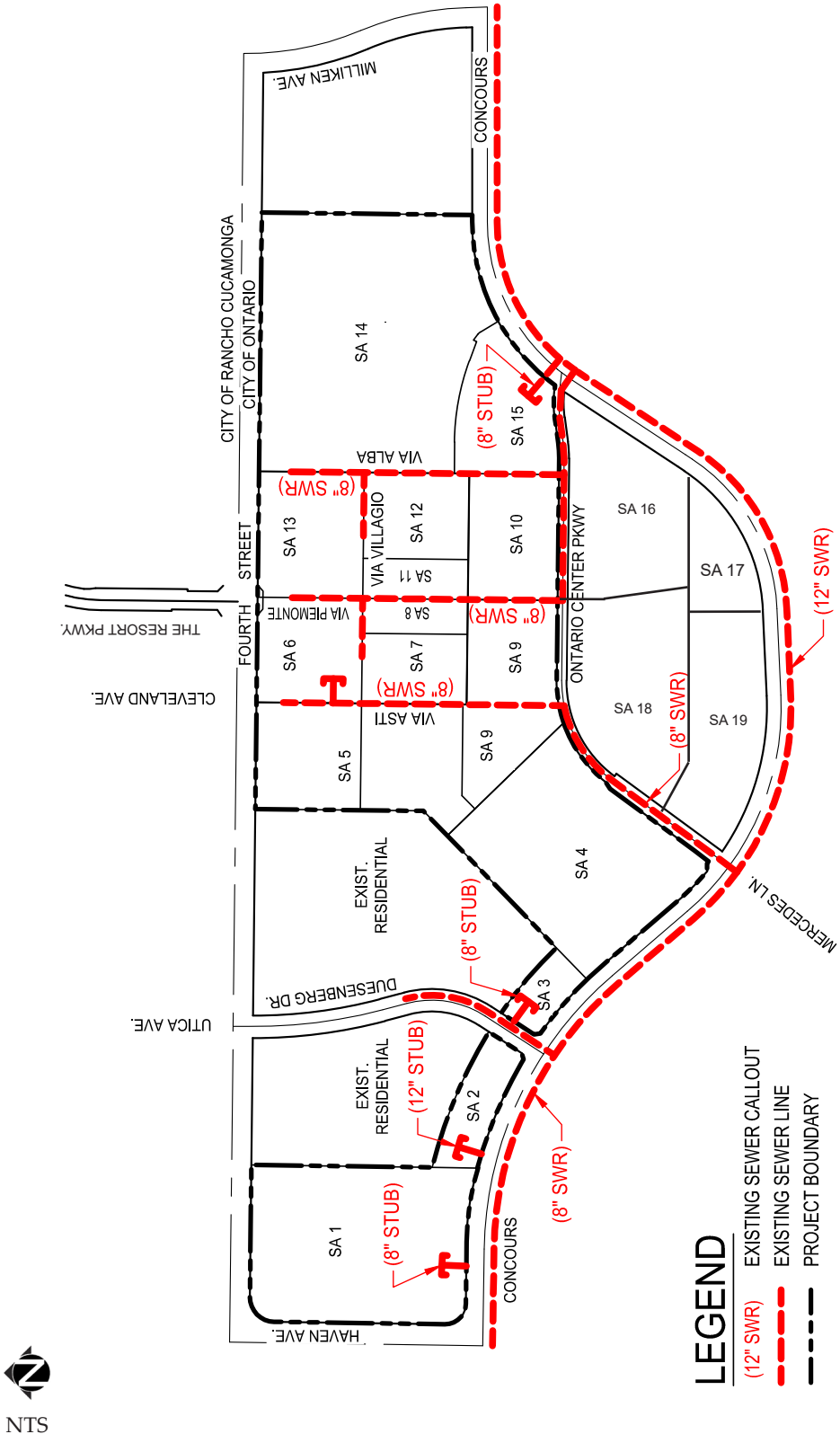


Figure 2.11: Wastewater Facilities Plan

2.6.2 Water Service

Water service to the Piemonte Overlay is provided by the City of Ontario. Existing water facilities include mains located in both Fourth Street and Concours Street. A 12-inch main in Fourth Street serves properties north of the Overlay, in Rancho Cucamonga and an existing City of Ontario 18-inch main located in Fourth Street will serve the Overlay. Fourth Street also contains a 36-inch City of Ontario transmission main. Additionally, Concours Street contains a 16-inch water main that will be used to serve the Overlay area. Water demands by use and for the entire Overlay, are contained within *Preliminary Sewer and Water Demand Study for Rancho Piemonte,* (SB&O, Inc.), dated August 8, 2005, and is available for review from the City of Ontario Planning Department. The proposed on-site water system lines and components are schematically presented in Figure 2.12: Water Facilities Plan.

The Study identifies the water demands for the various Piemonte Overlay uses, and acknowledges that use-specific fire flow requirements are the controlling factor in evaluating the hydraulic adequacy of a water distribution system. Based on the highest fire flow demand (hotel and high density residential at 3,500 gpm requirement), the Study concluded that the existing water system infrastructure surrounding the site is adequate to serve the Piemonte Overlay.

2.6.2.1 Recycled/Reclaimed Water System

Nearest to the Piemonte Overlay are the IUEA reclaimed water main which is installed in Sixth Street; a short segment of reclaimed water line in Haven Avenue between Sixth and Fourth Streets; with another segment located within Fourth Street, west of Haven Avenue. More specifically, a 30-inch reclaimed water main exists in Haven Avenue, turning west in Fourth Street. A 12-inch reclaimed water lateral exists in Milliken Avenue that terminates near Fourth Street. An 8-inch reclaimed water line has been installed in Concours Street, from Haven Street to Milliken Avenue. This reclaimed water line was installed as part of the Concours Street street improvements in 2002.

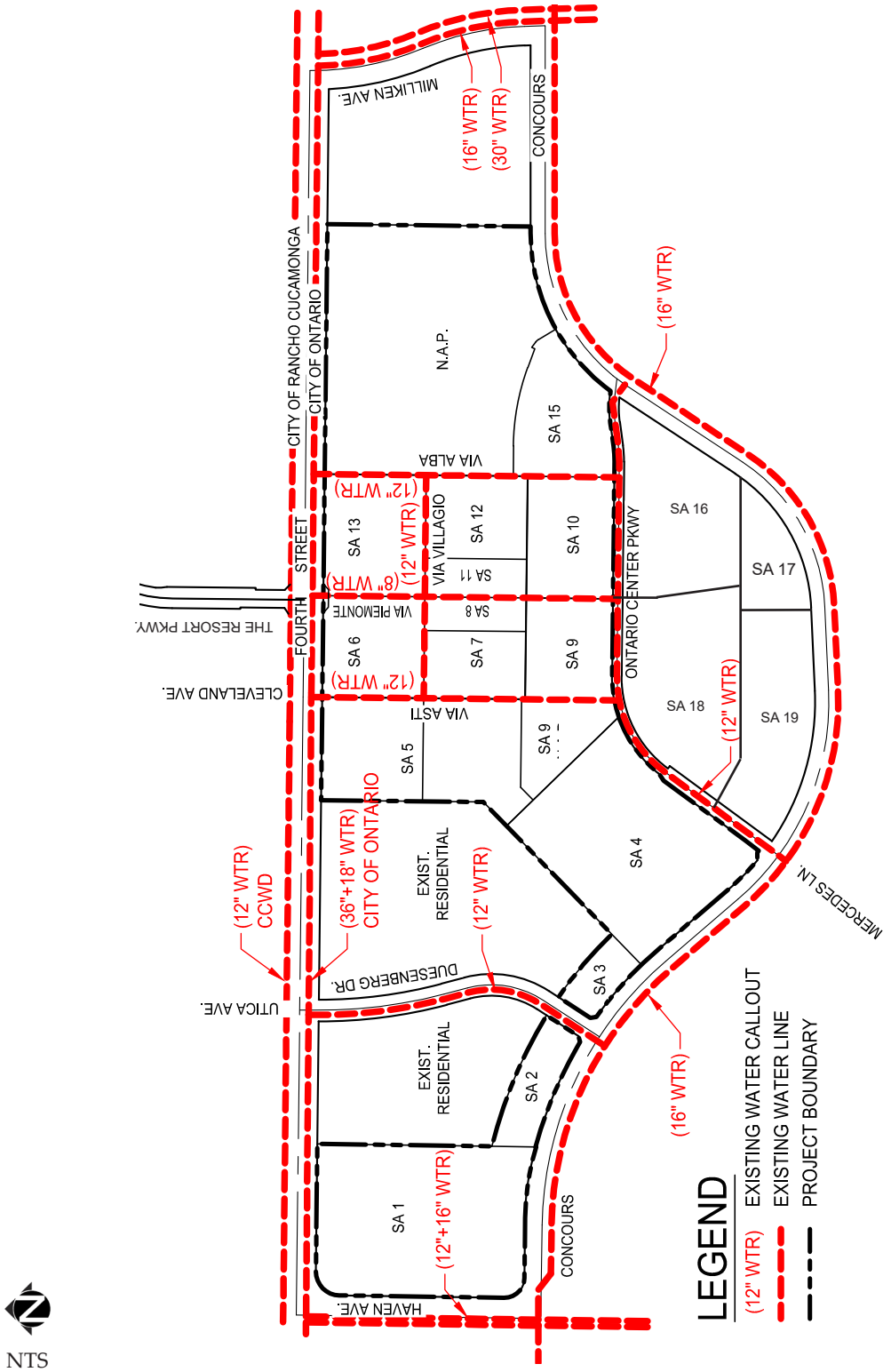


Figure 2.12: Water Facilities Plan

Additional reclaimed water facilities are constructed within the Piemonte Overlay, with connecting segment(s) in Milliken Avenue, Concours Street and Haven Avenue. Reclaimed water system improvements within the Overlay are illustrated on Figure 2.13: Recycled Water Facilities Plan, and include the following:

- Extension of the reclaimed water lateral from Milliken Avenue and Fourth Street, connecting to the reclaimed water line in Concours Street.
- Construction of a reclaimed water loop in Ontario Center Parkway to each intersection of Concours Street.
- Reclaimed water distribution lines extended northerly from Concours Street within Ontario Center Parkway and Via Alba.

New development shall comply with City Ordinance No. 2689 and make use of recycled water for all approved uses, including but not limited to landscaping irrigation.

Reclaimed water lines within public streets and public utility easements within private streets will be maintained by the City of Ontario Municipal Utilities Company (OMUC). The ownership and maintenance of common reclaimed water system components and lines within private drives in the Overlay will be the responsibility of the Piemonte at Ontario Center Property Owners Association, (POCOA) established pursuant to the Piemonte CC&Rs.

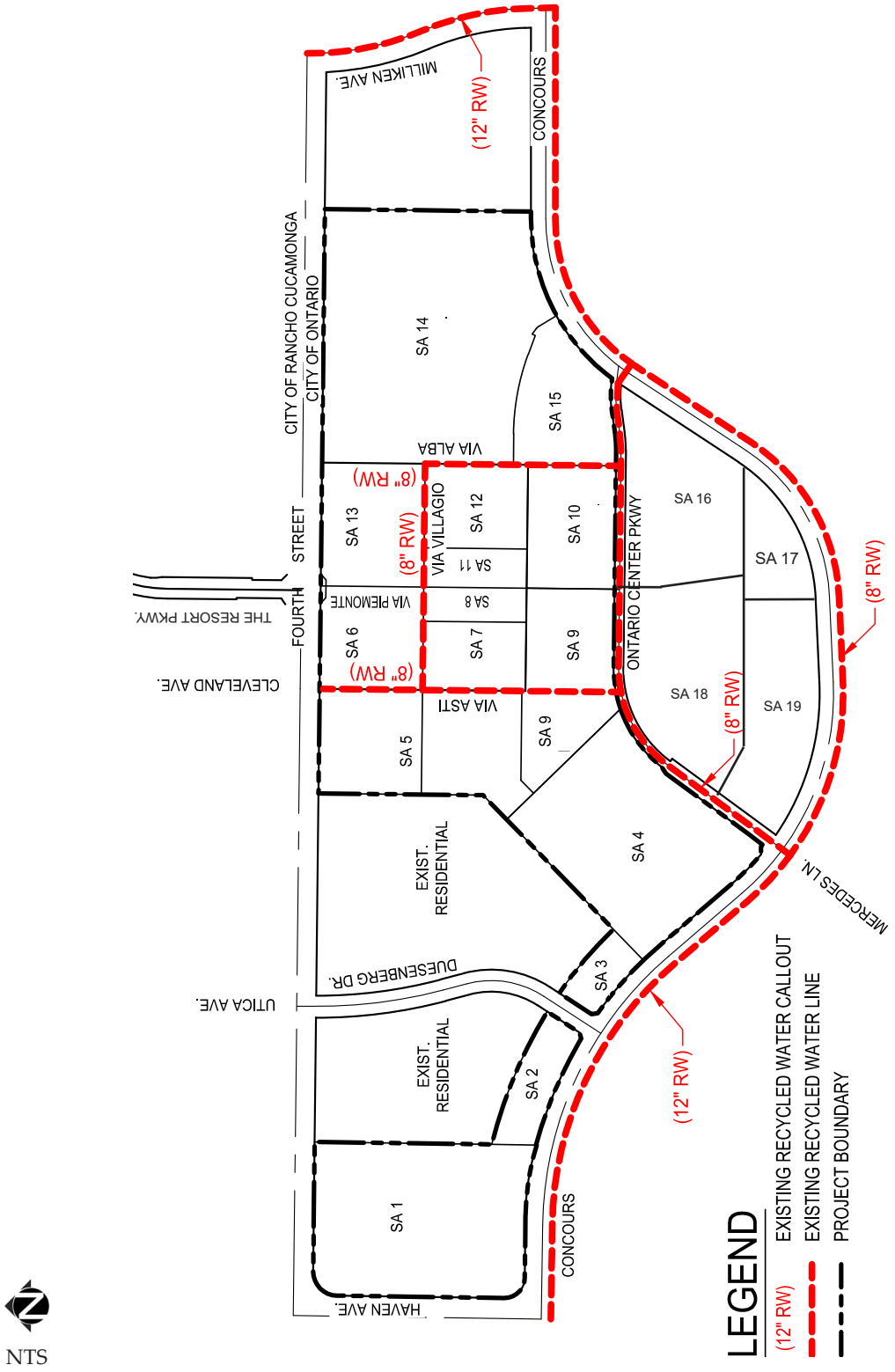


Figure 2.13: Recycled Water Facilities Plan

2.6.3 Stormwater Management

Existing and proposed stormwater management facilities, and conveyance systems and components, are schematically presented on Figure 2.15: Water Quality Management Plan. As a general note, development-related improvements and connections located within public streets will be maintained by the City. However, the ownership and maintenance of common stormwater system components and lines, as well as water quality treatment facilities, will be the responsibility of the POCOA, established pursuant to the Piemonte CC&Rs.

2.6.3.1 Stormwater Collection and Conveyance Facilities

Drainage in the Piemonte Overlay area flows in a generally north to south direction. North of the Overlay, an existing storm drain is located in Fourth Street. This storm drain collects and transports all drainage flows from the north and west, to Guasti Park. As such, the Overlay will not have to accommodate stormwater flows from the north. Stormwater run-off from the Overlay drains southerly, to Concours Street. Receiving reinforced concrete pipe (rcp) drainage facilities are located within Concours Street, and range in size from 48-inches to 72-inches in diameter. Flows from the Concours Street facilities empty into a 9-foot by 6-foot reinforced concrete box (rcb). Flows then continue southerly, toward Inland Empire Boulevard, then westerly to Mercedes Lane, and then southerly beneath I-10 in a 12-foot by 7-foot rcb to Lower Deer Creek Channel. Lower Deer Creek Channel confluences with Cucamonga Creek Channel, and flows to the Prado Basin.

The S*torm Drain System Summary for Piemonte* (SB&O, Inc.), dated January 30, 2006, concludes that the existing storm drainage facilities serving the Piemonte Overlay and vicinity have been previously sized to accommodate any proposed development. Additional internal drainage system improvements will be constructed to connect to the existing area-wide drainage system. Connection points to the existing system will be located so as to take full advantage of available carrying capacities, as shown in Figure 2.15: Water Quality Management Plan.

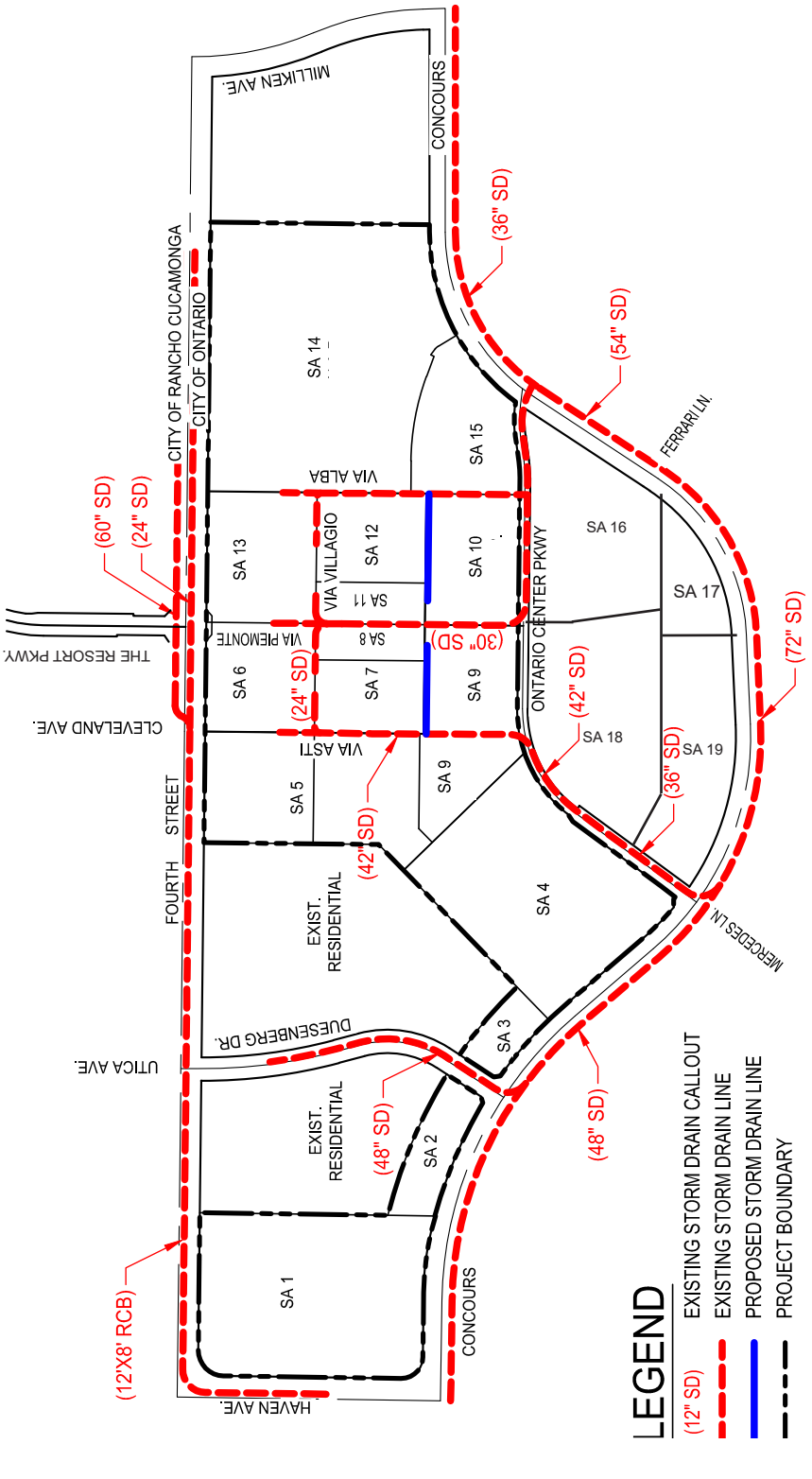


Figure 2.14: Storm Water Collection and Conveyance Facilities Plan

2.6.3.2 Stormwater Water Quality Management Plan (WQMP)

In addition to construction of required stormwater conveyance facilities described above, the City of Ontario and the governing Regional Water Quality Control Board (RWQCB) require that development in the Piemonte Overlay incorporate technically and economically feasible source control and Site Design Best Management Practices (BMPs), as discussed below.

Overview

The Santa Ana Regional Water Quality Control Board (RWQCB), under Order Number R8-2010-0036, NPDES Permit No. CAS618036, requires post-construction BMPs to be implemented for new development and significant redevelopment, for both private and public agency projects. The purpose of a Water Quality Management Plan (WQMP) is to develop and document the installation of structural stormwater quality facilities and the implementation of a program, including application of non-structural BMPs, which minimize the detrimental effects of urban stormwater run-off on the beneficial uses of receiving waters, including potential effects of increased pollutant loads and changes in hydrology.

Potentially adverse effects on receiving waters shall be minimized through the construction of Site Design/Low Impact Development (LID) BMPs with the highest priority for BMPs that retain/infilter the average 2-year, 24-hour storm run-off volume (85th percentile storm event) from the project, then other BMPs, such as harvesting and use, evapotranspiration, and biotreatment. To the maximum extent practicable (MEP), these LID BMPs must be implemented at the protect site. Where LID BMPs are not feasible at the project site, more traditional, but equally effective control measures, must be implemented. The combination of Site Design/LID BMPs, Source Control and/or Treatment Control BMPs included in project-specific WQMPs for new development within the Piemonte Overlay area shall address all identified pollutants of concern and hydrologic conditions of concern in run-off from on-site as well as proposed off-site improvements included in development projects.

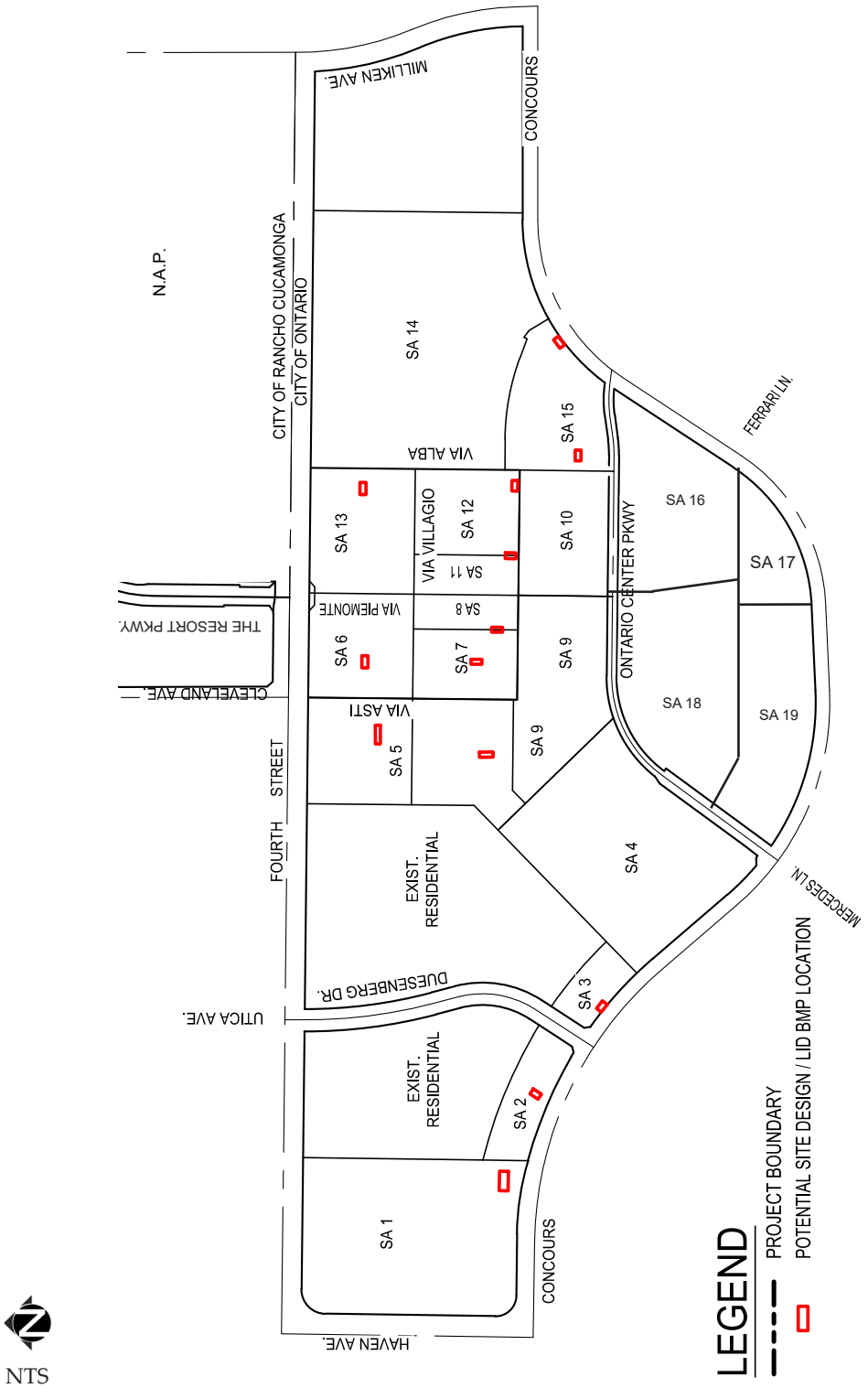


Figure 2.15: Water Quality Management Plan

Development projects within the Piemonte Overlay are required to meet the minimum County-side WQMP requirements applicable to Priority Projects by incorporating infiltration LID BMPs to the MEP; followed by biotreatment and harvest and use BMPS, for the remainder of the required storm run-off volume. Minimum source control BMPs and necessary treatment control BMPs shall also be documented, along with on-site LID BMPs, in project-specific WQMP plans. Where it is proven to be infeasible for a priority project to fully meet LID requirements based on implementing site design and on-site LID BMPs, a development project may alternatively participate in an available and approved regionally-based treatment program that addresses all identified pollutants and hydrologic conditions of concerns.

Project-Related Stormwater Treatment Requirements

The Piemonte Overlay is located within the Santa Ana Basin, designated as Region 8 by the RWQCB, and is tributary to Lower Deer Creek, the Chris Basin, Cucamonga Creek Flood Control Channel, Mill Creek, the Prado Flood Control Basin, and finally the Santa Ana River. In accordance with the Clean Water Act, the State of California maintains a list of impaired water bodies and the pollutant causing the impairment. The Cucamonga Creek Flood Control Channel is included on the State's list of impaired water bodies because of high coliform content. Mill Creek is also included on the impaired water body's list for nutrients, suspended solids, and pathogens. Because these receiving waters (which are tributary to the Piemonte Overlay) are impaired, development in the Overlay must incorporate BMPs that are rated high to medium in effectiveness for reducing the impairments. This assures a no net loading on the affected tributaries, and ensures that there are no additional pollutants added to the already impaired water bodies.

Project-Related Stormwater Treatment Improvements

Since the predominate soil type in the Piemonte Overlay areas is "Class A,"the mandated on-site LID/Site Design BMP measures will be designed into each development project within the Piemonte Overlay Specific Plan area will be

retention/infiltration of the required Design Capture Volume (DCV) of run-off through the use of a combination of various landscaped basins, trenches/swales, and underground infiltration systems (with pre-treatment BMPs), on individual parcels. All proposed LID/BMPs and pre-treatment facilities will be designed and implemented consistent with City and County-wide WQMP requirements. General locations and configurations of proposed LID stormwater retention/infiltration facilities are presented on Figure 2.15: Water Quality Management Plan.

2.6.3.2 Project-Related Stormwater BMP Compliance During Construction Phase

Prior to the issuance of grading or construction permits for any development project disturbing one-acre or more of land, within the Piemonte Overlay Specific Plan area, project applicants shall be required to obtain coverage under the California General Permit (CGP) for Stormwater Discharges Associated with Construction and Land Disturbance Activities and prepare and submit Erosion/ Sediment Control Plans and Storm Water Pollution Prevention Plans (SWPPPs), along with project Grading Plans, to the City of Ontario and the State Water Quality Control Board's "SMARTS"website, at the time of permit application. The SWPPP shall be prepared to comply with the requirements of the California State Water Resources Control Board's (State Water Board) current "General Permit to Discharge Storm Water Associated with Construction Activity" CGP and the current "Area Wide Urban Storm Water Runoff (Regional NPDES) Permit for San Bernardino County.

2.6.4 Solid Waste

Solid Waste services are provided by Integrated Waste. Solid waste requirements are per the City's Solid Waste Department Refuse and Recycling Planning Manual.

2.6.5 Fiber-Optics

The City of Ontario is developing a fiber-optic telecommunications system throughout the City commonly known as OntarioNet. The fiber-optic telecommunications system is capable of providing advanced internet/data services to homes and businesses in feasible areas within the City. OntarioNet will provide community related services including: traffic management; online civic services; meter reading; educational services; and a variety of other community services. OntarioNet and the high-speed data services it provides, will keep the City on par with the modern workforce and ever changing lifestyles of the people and the community.

Communication systems proposed on-site facilities will be placed underground within a duct and structure system to be installed by the Developer, as illustrated in Figure 2.16: Fiber-Optics Plan. Maintenance of the installed system will be the responsibility of the City and/or special district fiber optic entity and not that of the Developer, private homeowners association or private homeowners. Development of the project requires the installation by the Developer of all fiber optic infrastructure necessary to service the project as a stand alone development.

Trenching, joint trenching and boring shall be used to install the fiber-optic conduits. Fiber-optic conduit placement will generally be in a joint trench with street light conduits or in a separate trench/bore and in the Right-of-Way (ROW) generally placed behind the sidewalk. Resulting conduit placement will be on the north side of street and the east side of street based on the direction of the street. Properly sized handholes shall be placed along the conduit path no greater than

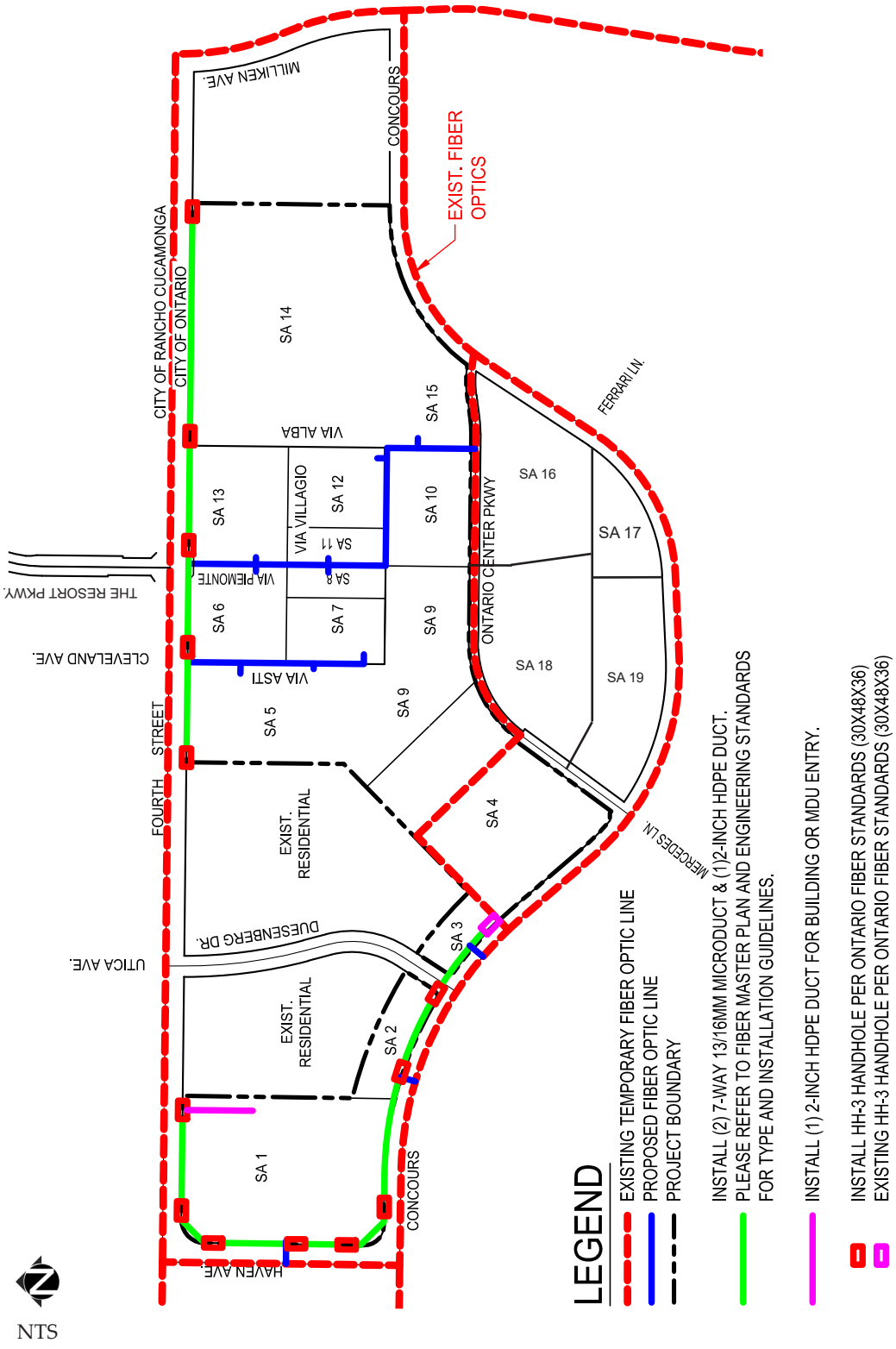


Figure 2.16: Fiber-Optics Plan

500 feet apart in major streets and no greater than 300 feet apart within in-tract community streets. Handholes shall be strategically placed to allow for efficient entrance into commercial buildings, and residential properties and multi-dwelling units. Refer to Figure 2.16: Fiber-Optics Plan for existing and proposed fiber-optics locations.

2.7 DEVELOPMENT CONSTRUCTION

Development of the Piemonte Overlay area is anticipated to be incremental. Subarea 12 is currently under construction for 72 multiple-family residential units. A Development Plan for Subarea 15 was approved for 110 multiple-family residential units.

Specific site grading, frontage and any off-site improvements, will occur as defined in the Tentative Map and/or Development Plan application. The final number of construction phases is unclear at this time. The number of phases and number of units in each phase may be altered from time to time, subject to City review and approval.

Where the pedestrian network is internal to a development parcel or land use, e.g. in the westerly portion of the Piemonte Overlay area, that portion of the network will be completed concurrent with development of the accommodating parcel or land use. Use and tenant-specific infrastructure connections, as well as development-specific amenities, and specific landscaping/streetscaping, will be completed concurrent with each increment of development.

3.0 DESIGN GUIDELINES AND DEVELOPMENT REGULATIONS

This Section presents the Design Guidelines and Development Regulations applicable to the Piemonte Overlay. The Design Guidelines identify physical and thematic attributes or requirements. Complementing these Design Guidelines, the Development Regulations identify permitted land uses and provide direction and requirements for development locations, configurations, orientations, and construction for each Land Use Subarea. Please refer also to the delineation of the Piemonte Overlay area and its component Land Use Subareas, presented previously on page 2-5.

All Design Guidelines and Development Regulations are comprehensively identified within this Section. In this regard, it is noted that the Design Guidelines and Development Regulations are predominantly consistent with requirements of the encompassing OCSP; however where they differ, the Piemonte Overlay supersedes the requirements of the OCSP. For ease of reference, where OCSP requirements are applicable to the Piemonte Overlay, those portions of the OCSP have been incorporated in this document.

Prior to issuance of development permits, all facilities proposed within the Piemonte Overlay will be evaluated by the City for consistency with the Piemonte Design Guidelines and Development Regulations, and applicable City regulations. Please refer also to development review and approval processes outlined in Section 4.0, Administration.

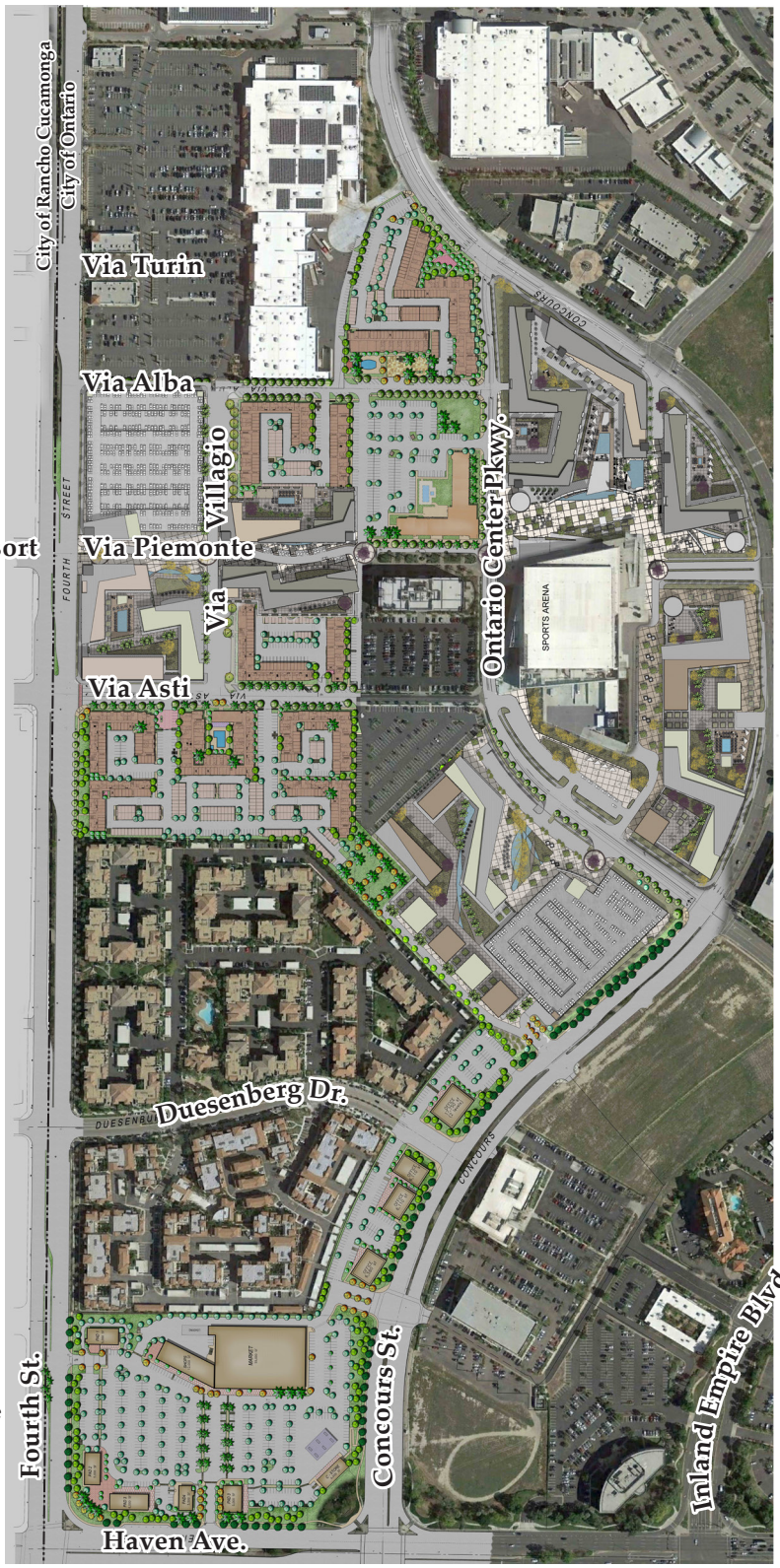
3.1 OVERVIEW

The design concept is based on the existing grid-like pattern of streets and blocks, to be developed along Via Piemonte as the main corridor. Via Piemonte will offer a series of retail spaces on the ground floor and residential uses above with a variety of landscape and hardscape features with a focus on pedestrian oriented areas. The building mass and placement along Via Piemonte will be used to create interesting spaces, which may include courtyard spaces, open plazas, outdoor seating and dining areas. The mixed use spaces along Via Piemonte will connect Fourth Street to an entertainment center surrounding the Arena. Parking is provided for all retail/restaurant and office uses, with separate secured parking to be provided for residents, refer to Figure 3.1: Design Concept. On street parking will be provided for guests of residents.

The north-south Via Piemonte is aligned between the Arena, and connects to Fourth Street at the northerly boundary. The intersection at Fourth Street will be widened and include a signalized intersection. The intersection of Via Villagio at Via Piemonte establishes a main activity node and focal plaza area, around which retail and restaurant uses will be constructed.

Site design and architectural themes between the residential and non-residential reflect a contemporary urban Southern California design and include visual cues encouraging perception of a cohesive Piemonte development.

Supporting the urban setting, land use associations and configurations within the Piemonte Overlay provide for a mix of office, hotel, commercial, and high-density residential uses, interconnected by pedestrian and vehicle corridors, with interspersed activity areas.



Note: The site design represented is conceptual in nature, and exemplifies one possible design scenario that has been developed in accordance with the design criteria of the Piemonte Overlay and may not represent ultimate building layout.

NTS

Figure 3.1: Design Concept

3.2 ALLOWED USES

Uses allowed within the Piemonte Overlay as a whole, and within each Specific Land Use are the same uses listed under the CR (Regional Commercial) zoning district in Table 5.02-1 (Land Use Matrix) of the Ontario Development Code, for permitted, conditionally permitted, administratively permitted, and prohibited, with the following exceptions:

- High Density Residential uses are permitted in Subareas 2 and 3.
- A gas station with a convenience store and a car wash is permitted in Subarea 1.
- Within the Residential Subareas, second floor individual offices above the separate, stand-alone garage buildings are allowed. The offices would be accessible via stairs, and would be rented only to existing residents of the same Subarea where the garage is situated. There would be a total of 3 to 6 offices, each about 14 feet x 14 feet. No other amenities, including bathrooms, would be included on the second floor. The offices would be rented to residents desiring an office (home occupation) separate from their apartment home. To limit traffic and parking needs, office tenants would not be allowed to entertain, consult with, or host clients or other third parties at their office.
- One office building is permitted facing 4th Street in Subarea 13; all remaining use are required to be Mixed-use uses. Mixed-use includes the following types of uses:
    - Multiple-family Residential
    - Food and beverage, experiential-oriented retail.
    - Craft sit-down and community table eateries.
    - Brewpubs, beer gardens, taverns, bars, clubs, wine bars distilleries.
    - Live music, or nightlife.
    - Outdoor patio dining and bar service.
    - Temporary Alcohol zones permitting transport of alcoholic beverages from one establishment to another within the zone may be established

with an Administrative Use Permit granted pursuant to Section 4.03.105 of the Ontario Development Code.

- Dining and entertainment destinations.
- Special street events; including but not limited to farmers' markets and holiday events.
- Loft or general offices permitted on upper floors.
- Related retail uses that support or complement the intent of entertainment commercial including small components of general and service retail, including up to one drive-through and up to three quick service retail (QSR) establishments that could be located within a single building not to exceed 10,000 square feet may be located in Subarea 13 along the eastern edge. One freestanding bank building is permitted.
- The following uses may be considered Retail Entertainment uses; however, they are also allowed in the other Commercial Land Use areas:

Primary Objectives:

- Bakery
- Banking
- Brewpub/Bars
- Candy Shop
- Cheese/Charcuterie Shop
- Coffee Shop
- Entertainment/Amusement
- Fast Food – for QSR
- Food or Beverage Specialty
- Ice Cream
- Produce/Farmers Markets
- Restaurant – Family and with Liquor

Secondary or Ancillary Objectives:

- Apparel – Activewear/Specialty (yoga, etc.)
- Art – Dealers and Supplies
- Books – Store or Library
- Boutique Fitness – such as Bootcamp, Spin, etc.
- Florist
- Gift Specialties (Stationary/ Office Supplies)
- Jewelry
- Museums
- Salon – Blowdry Bar/Barbershop
- Sound Recording Facilities
- Sporting Goods – Outdoor Sports Specialty
- Tobacco/Cigars

- Uses are permitted to operate for 24 hours a day, subject to CUP and/or ABC requirements.
- Notwithstanding anything to the contrary in this Overlay, any store, restaurant or other establishment which includes a vehicular drive-through (whether covered or not) shall be permitted in SA 1 or SA 13 (and only along the eastern edge of SA13). In the northwest corner of SA6, one building including a QSR or a bank will be permitted; in the event the bank~~,~~ includes an ATM/drive-through facility, such ATM/drive-through shall be located on the western or southern sides of the building and shall be sufficiently shielded from adjacent residential units such that any noise, light or use is mitigated to imperceptible levels within the residential units.

3.3 GENERAL DEVELOPMENT STANDARDS

Unless otherwise noted herein, Table 3.1: Piemonte Development Requirements lists the requirements applicable throughout the Piemonte Overlay.

3.3.1 Setbacks

Reflecting the urban design, buildings may extend up to public access/utility easement limits and prescribed setbacks, except as otherwise provided for herein. Precise building setbacks will be a function of final site and building design plans, and will be determined through City's review processes.

3.3.2 Landscaping and Open Space

All required setbacks from streets shall be permanently landscaped in an attractive manner with sidewalks, trees, shrubs, groundcover, and other supplementary materials. Low walls are permitted in the streetscape area. Please refer also to related discussions presented in Section 3.8.2 Landscape/Streetscape Development Regulations.

Table 3.1: Piemonte Development Requirements

	Commercial & Mixed-use	Office	Special Use/Hotel	Residential
Minimum Setbacks - Buildings				
Public Streets (measured from P/L)				
Fourth Street	30′	N/A	N/A	30′
Haven Avenue	15′	N/A	N/A	N/A
Duesenberg Drive	N/A	15′	N/A	N/A
Ontario Center Parkway	N/A	15′	15′	15′
Concours Street	15′	N/A	N/A	15′
Private Drives (measured from face of curb)				
Via Asti	15'	15'	N/A	14′
Via Piemonte+	5′	5′	5′	N/A
Via Alba	16′	N/A	20′	14′
Via Villagio+	15'	N/A	N/A	15'
Interior				
Property Line	0′	0′	0′	5′
Minimum Setbacks - Parking Lots				
Fourth Street (measured from P/L)	15′	N/A	N/A	15′
All other Public Streets (measured from P/L)	10′	10′	10′	10′
Private Drives (measured from face of curb)	10′	10′	10′	5′
Other Requirements				
Minimum Building Separations	16′			
Maximum Building Coverage	100% minus required building setbacks and landscaping requirements			

Minimum Residential Open Space/ Dwelling Unit	Common Active*	10′ minimum dimension, 10′ from residential units; 0′ from recreation facilities	N/A	N/A	10′ minimum dimension, 10′ from residential units; 0′ from recreation facilities
	Common Passive**	5' minimum dimension	N/A	N/A	5′ minimum dimension
	Subtotal Common Open Space (Common Active & Common Passive)	150 SF	N/A	N/A	215 SF
	Private	50 SF; 6' minimum dimension	N/A	N/A	50 SF; 6′ minimum dimension
	Total Open Space	200 SF	N/A	N/A	265 SF
Residential Storage Space***		160 CF	N/A	N/A	160 CF

+ Average 15' building setback.
* Includes club, business center, fitness facilities, and roof decks.
** Include building setback areas and can be adjacent to residential units.
***Adequate lockable private storage space shall be provided within a garage or storage building, or a space directly accessible from the dwelling. Exterior closets accessed from patios or balconies may be used if screened from public view.

3.3.3 Maximum Building Height

There is no maximum building height except that all buildings shall comply with the height limits set forth in the ONT ALUCP. Furthermore, northern portions of the project area are located within the ONT ALUCP High Terrain Zone where buildings are limited to 70 feet in height. Refer to ONT ALUCP for more information regarding height criteria and policies.

3.3.4 Open Space

Common Residential Open Space will be provided as identified Table 3.1: Piemonte Development Requirements. Please refer to related discussions presented under the SPA topical heading of “Landscape/Streetscape.” Active open spaces shall be provided that include a pool and spa, clubhouse, dog

park, and roof-top amenity deck and comply with the minimum requirements for common recreation amenities stipulated in Ontario Development Code Table 6.01-5, except as otherwise stated in Table 3.1: Piemonte Development Requirements of this document.

3.3.5 Parking

Livability of a community can be greatly impacted by the type and availability of parking. In urban settings, parking can be uncoupled from individual units for practical design and financial reasons, enabling an environment that promotes pedestrian access over vehicular storage. Parking may be "un-coupled" from a use where a parking demand study validates the approach, enabling development of creative development that focuses on living, mobility and access over parking storage. There is the potential for reciprocal parking between Piemonte Overlay uses and the adjacent Arena.

All on-site, off-site, and on-street parking will count toward a development's required parking calculations; all on-street parking used to meet vehicle parking requirements shall be shown on plans during the development review and/or Tentative Map approval process, and may only be allocated to a single parcel or development (if comprised of multiple parcels). Residential parking spaces may be located up to 250 feet from the assigned unit.

All development is highly encouraged to leverage transit, multi-modal, and shared parking opportunities to reduce required parking demand. Parking reductions may be achieved through shared parking, or other strategies that reduce the amount of area devoted to parking and to increase the use of alternative forms of mobility, as validated by a Parking Analysis Study as provided in Section 6.03.020 Reduction in the Required Number of Parking Spaces of the Ontario Development Code.

3.3.5.1 Minimum Parking Requirements

Off-site parking and loading facilities for each of the Piemonte Overlay Land Use Subareas shall be provided pursuant to the requirements of Ontario Development Code Division 6.03 (Off-Street Parking and Loading), except that parking facilities for residential and commercial uses shall be provided as follows:

- Studio Unit – 1.0 space per unit.
- One bedroom unit – 1.0 space per unit.
- Two bedroom unit – 1.75 spaces per unit.
- Three or more bedroom unit – 2.0 spaces per unit.
- Residential guest parking for Subareas 8, 11, 16 and 17 - 0.0 space per unit.
- Residential guest parking for all other Subareas – 0.2 space per unit. Guest parking shall be accommodated within the host lot/building, in common parking areas along abutting private drives, or on adjacent private drives.
- Parking for commercial, retail and restaurant uses in the Mixed-use land use designations may be absorbed by the existing surrouding public parking lots.

3.3.5.2 Parking Supply and Design

Parking spaces, lots, and facilities shall optimize the unique development opportunity in the Piemonte Overlay and design ways to creatively integrate parking spaces, lots and facilities into development projects through elements such as architectural design, amenities, and multi-purpose features. Parking supply and design shall comply with the development standards of Ontario Development Code Division 6.03 (Off-Street Parking and Loading) and the take into account the following:

- A parking management plan shall be submitted for Planning Director approval, prior to issuance of building permits. This plan shall justify the mix and sizing of compact and tandem spaces, shall indicate how the residential parking will be restricted to avoid overflow into the commercial

parking area, and shall ensure that tandem parking spaces will be assigned to residents of the same dwellings.

- Parking spaces shall not obstruct access to building entrances, trash storage areas or loading areas.

3.3.5.3 Parking Structure Design Guidelines

Parking structures shall be designed to be compatible with the surrounding develoment and incorporate architectural features that create visual interest, distinction, and enhances the development project's identity. These guidelines are applicable to all parking structures with the Piemonte Overlay.

General:

- Below-grade parking is encouraged with garage entries placed at the rear or sides of the project whenever possible. Garage entries should be recessed as much as possible from the building facade.
- Where full below-grade parking is not feasible, consider placing some of the parking below grade (e.g., one or two floors) to reduce the size and bulk of the above-grade parking.
- Automated mechanical parking systems may be considered. Benefits such as smaller space requirements, lower lighting needs and reduced ventilation requirements will factor into the deci-sion. A Parking Management Plan will be required for approved mechanized parking systems.

Site Development shall take into account the following:

- Above-grade parking structures will be expected to be located away from major street frontages unless it can be demonstrated that other locations are not viable.
- Vehicular entries for parking structures should be placed on the street on which it will have the least negative impact.
- The layout of a parking garage should take into account and be integrated with existing traffic circulation patterns of surrounding streets and/ or internal site circulation systems. Entrances and exits should be located

to minimize vehicles entering or exiting onto residential streets or busy intersections.

- Pedestrian circulation should be delineated and separated from automobile circulation. The use of landscaping, walkways and decorative hardscape is encouraged to emphasize pedestrian areas.
- Pedestrian routes from the parking structure lobby to the principal buildings served should provide an aesthetic transition compatible with the quality of the building.
- Trash enclosures should not be placed adjacent to points of pedestrian or vehicular access. Any trash enclosure located within the footprint of the parking structure should be enclosed on four sides.
- Locate and design vehicle entries so that they do not dominate the streetscape. Recess the garage vehicular entry portion of the facade or extend portions of the structure over the garage entry to help subordinate its impact.
- Subordinate the garage entrance to the pedestrian entrance in terms of size, prominence on the streetscape, location and design emphasis.
- Whenever possible, avoid vehicular entries along major pedestrian routes.
- Provide sufficient vehicle queuing space on-site to avoid backups onto public thoroughfares. Pay particular attention to stacking and queuing space if there are entry gates or other impediments to smooth traffic flow.
- Locate vehicular parking structure entries on a clear path and sequence from a building or drop off area, if one exists.
- Minimize the visibility of parking structures from the public realm. Avoid corner locations whenever possible.
- Parking structures shall meet the minimum setback and landscape standards of Section 3.3 General Development Standards, of this document.
- All appurtenances (i.e., transformers, ventilation shafts, etc.) should be

located outside of any required setback and should be screened from public view.

Landscaping:

- The edges of any garage structure and vents into the garage visible above grade should be screened with evergreen plant materials. Earth berms and other techniques to tie the garage structure into the surrounding grade level should be considered.
- Architectural treatments, artwork, lattices and other design features are encouraged for use on parking structures where blank walls occur. The design features should cover a minimum of 60% of the blank wall.
- If lattice is used, the material should be decorative and durable to enable vines to attach themselves for support.
- Water conservation should be an important consideration when selecting a plant palette. Plant materials should consistent with the landscape requirements of Section 2.5 Landscape Concept, of this document. An automatic irrigation system should be designed to provide deep watering for trees, shrubs and vines along with moisture sen¬sors to monitor and minimize water usage.

Parking Structure(s) Layout:

- Vehicle circulation within the parking structure should be continuous and uninterrupted at all levels. Dead-end parking aisles are not an ac¬ceptable solution to parking circulation unless all parking is designated as Reserved Parking. Where dead end aisles are unavoidable (e.g., for guest parking within a sloped ramp garage) provisions should be made for dedicated No Parking areas at the end of the aisle for easy turn around.
- Interior pedestrian paths should be visible to drivers and delineated to differentiate them from vehicle travel aisles.
- Maximum vehicle ramp grade the California Building Code requirements.
- Elevator and stair shafts, mechanical rooms and similar visual disruptions

should be located to minimize the blockage of views between drivers and pedestrians.

- Pedestrian access should be designed to safely avoid pedestrian entry and exit of the garage via vehicular ramps and provide a minimum four (4)-foot wide pedestrian sidewalk along the side of every vehicular access driveway.
- Internal garage layouts should make provisions for car sharing priority spaces and electrical charg¬ing stations.
- Stall width and depth and aisle width should gen¬erally be in accordance with the City of Ontario Development Code Off-Street Parking Requirements (Chapter 6.0, Division 6.03).
- Parking structures should provide a minimum floor to ceiling height of eight (8) feet exclusive of structural elements and appurtenances. Ad¬ditional height will be required per California Building Code for disabled access.
- Tandem parking and mechanical lifts may be considered only when consistent with parking requirements of Section 3.3.5 Parking of this document.
- Avoid garage vehicular exit locations where the glare of headlights on departing cars would have adverse impact on uses across the street.

Architectural Designs and Details:

- The design of all parking structures should be more than a rectangular utilitarian box composed of concrete or steel beams and columns. Variation in forms and detail along with high quality facing materials are expected where viewable by project users and the general public.
- Special attention should be given to emphasizing the pedestrian entries of parking garages with special materials, landscaping, paving, architectural details and public art.
- Parking structures with frontages on public streets will receive additional design review scrutiny and will be expected to include high quality materials and finishes on those facades. The incorporation of brick, stone

and precast concrete are pre¬ferred choices. The integration of metal panels or metal mesh screens may be considered.

- Exterior elevations should incorporate design components and materials utilized and compat¬ible with the primary building(s) within the Piemonte area.

Lighting:

- Parking garages should utilize full spectrum light¬ing to increase safety and comfort. The placement of fixtures should be designed to minimize light pollution from the garage.
- Utilize shielded fixtures to minimize light pollu¬tion and glare from both within and outside the garage.
- Design lighting levels for the unique circum¬stances and location of the garage. Higher levels are recommended for remote areas subject to security considerations (e.g., stairways, elevators and pedestrian access points.
- Interior walls and ceilings should be painted a light color to improve illumination.
- All mechanical equipment and piping should be painted to match the interior of the structure.

Security:

- For public safety, non-gated secured parking structures should provide natural surveillance by providing high visibility into the structure from adjacent activity and public areas.
- Locate and design elevators and stairways to allow internal and external visibility.

3.3.6 Structured Wiring

Residential (single-family and multi-family), commercial and industrial developments shall adhere to the City's Structured Wiring ordinance. An integrated structured wiring system (low-voltage wiring) provides infrastructure for today's technology applications and the framework for the future technology

advances. Requirements and benefits of a structured wiring system include:

- Allows for uniform receipt and distribution of technology services.
- Ensures scalability of wiring for future technology advances.
- Provides consistent and identical wiring protocols throughout developments.
- Enables the property infrastructure to interface efficiently with broadband networks for highest bandwidth capacity.
- Adoption of these standards will minimize retrofitting required to ensure new property owners are capable of the latest technologies and services.

3.4 COMMERCIAL AND MIXED-USE DESIGN GUIDELINES

These two Land Use areas continue certain defining architectural elements evidenced elsewhere within the Piemonte Overlay e.g., archways, pitched roofs, articulated cornices, and accent elements. These elements will be incorporated and interpreted within the Commercial and Entertainment/Retail Land Uses, thereby establishing thematic design tie-ins with other Piemonte land uses, while providing flexibility to accommodate established corporate architectural features, building elevations, and footprints of nationally-recognized major tenants. These Land Uses will also incorporate other unifying thematic features and elements of the Piemonte Overlay including but not limited to: landscaping, streetscape, lighting, and signs.

Commercial, Mixed-use, and Office building form and massing play a critical role in framing urban environments. Buildings should incorporate design and construction methods that add a human scale to the building massing and three dimensional detailing that casts shadows and creates visual interest on the facade.

- Buildings shall be oriented toward the street, where feasible, and designed to promote a pedestrian-friendly environment.
- Buildings may also be oriented away from the street, to frame interior courts, pedestrian walks and parking areas.

- Shadow patterns of adjacent buildings should be studied during the conceptual design phase so as to limit obstructed solar access.
- Blank walls facing Haven Avenue, Fourth Street, Concours Street and Ontario Center Parkway shall be avoided.
- Adjacent to the Via Villagio and Via Piemonte, building facades should consider a pedestrian orientation. This includes variation in massing, roof forms, wall planes, and surface articulation. It is expected that the highest level of articulation will occur at front entries.
- Primary building entrances shall be clearly defined, visible and inviting. Building entrances shall incorporate one or more of the following:
    - Change in wall plane including recessed doors, archways, or enhanced trim around openings.
    - A projecting element above the entrance, such as an awning, shade device or architectural design feature.
- Loading and delivery areas should be clearly marked with directional signage and located to the side or rear of the structure.
    - Loading docks and service bays shall be a minimum of 20 feet from any public street.
    - Service and delivery areas should be placed away from Haven Avenue, Fourth Street, Concours Street and Ontario Center Parkway.
    - Loading or unloading of trucks is prohibited between 10 PM and 7 AM unless it can be demonstrated that such activities would not exceed the noise limits of the Development Code.
- Trash enclosures should be designed using similar materials and colors as the surrounding buildings within the development. They shall be sited where least visible to the public and shall be roofed to prevent exposure to wind and rainfall. Where feasible, trash enclosures should be combined among parcels and tenants and pedestrian access should be provided.
- Work areas, equipment, and outdoor storage shall be screened from public view or be designed to complement the architecture.

- Buildings and on-site circulation systems shall be coordinated to minimize pedestrian and vehicle conflicts.
- Fire Department sprinkler assemblies shall be designed into the building or site plan, such that the assemblies are not in the public right-of-way or obstruct vehicle or pedestrian circulation.

3.4.1 Architectural Guidelines

The architectural styles for the Commercial, Mixed-use and Office areas include architectural styles complementary to the existing buildings within the OCSP and the new residential buildings. These architectural styles include:

- Contemporary.
- Main Street.
- Mediterranean.
- Agrarian Industrial.

Additional styles may be proposed; however, they must follow the same principles and attention to detail as the specific vernaculars listed here.

3.4.2 Contemporary Style Guidelines

The Contemporary Style guidelines promote cutting edge architectural design appropriate to residential uses by using intersecting linear planes, flat roofs, cubic forms, wide overhangs, stacked stones, and the integration of landscape with the buildings. Exterior building materials may include stucco, concrete horizontal or vertical siding, curtain walls, brick or stone veneers, glazing, architectural panels, and metal accents.

Mixed-use projects present a prime opportunity to create a distinctive development that would cater to high levels of pedestrian activity, entertainment venues, multi-family units, dining, passive and active recreation, botique retail, etc. Utilizing contemporary style architecture would allow design creativity in how the mixed-use spaces could be integrated together, such as placing retail on the ground floor retail and groupings of residential buildings with irregular angles and orientation on the upper floors. Color variations on building exteriors could be implemented to complement layers in building facades and architectural features to create visual interest and appropriate scale.

Table 3.2: Commercial Contemporary Style Guidelines

Element	Standards*	Permitted Enhancements
Roof Components	• Flat roof with or without ledges • Simple unadorned OR detailed parapet walls	• Accent roof features as appropriate • Signature towers OR vertical projections can extend above roof line • Cantilevered projections • Curved or arched roof
Architectural Components	• Utilitarian and "edgy" • Simple, clean forms	• Projections OR wall planes articulate facade
Wall Materials	• Stucco, metal, concrete OR cementitious siding • Contrasting wall materials and textures	• Asymmetrical facade • Horizontal OR vertical elements • Brick OR stone veneer • Metal accents • Concrete • Sunshades • Glass • Architectural panels
Trim & Details	• Color blocking as appropriate	• Metal awnings OR overhangs
Windows	• Aluminum store front OR curtain wall • Variety of window patterns	• Larger window modules • Long ribbons of windows sometimes wrapping around corners

* All of the standard characteristics shall be incorporated into the design of any building using this architectural style. Variations shall be subject to review and approval by the City.

3.4.3 Main Street Style

In the 19th century, typical Main Street architecture was built as a single building or in groups of buildings, with party walls. Brick store fronts could extend up to a block in length. These buildings varied in height from one to three or more stories. In urban settings, this style was often occupied by a business on the ground floor and offices, apartments or owner's residence above. Typically the building had a tripartite organization of base, middle and top. Entrances were located on- or off-center. The lower level was dominated by large windows framed by the building's corners and the panel of brick between floors. The upper levels sometimes included single or double bay windows, brick friezes, panels and decorative cornices. Other options include the use of corniced parapets, continuous sills or decorative lintels and string or belt courses dividing the wall laterally. The cornice functioned as a cap under which other elements were arranged and balanced.

Table 3.3: Main Street Style Guidelines

Elements	Standards*	Permitted Enhancements
Architectural Components	• Simple box, multi-story 'storefront' form with accent elements at entries • Recessed doorways, tower elements OR applied architectural accents at entries • Tripartite organization of base middle and top through use of horizontal belt course, change in material or massing offset	• Multiple building heights created by varied parapets, towers, vertical projections at corners and cornice design • Balconies • Colonnade • Raised stoop • Decorative pilasters • Horizontal modulation of about 25'
Roof Components	• Flat roof with parapet • Roof pitches not applicable • Accent roof forms OR projecting awnings encouraged	• Decorative cornice detail that unified the facade OR provides variety
Wall Materials	• Stucco with accent materials (siding, brick veneer, metal, scored stucco in accent color, etc.) • Neutral and accented colors appropriate to the materials used	
Trim & Details	• Awning OR projecting feature accenting overall design	• Features borrowed from traditional American Main Streets, appropriate to scale and massing of building
Windows	• Vertical, may be single OR multi-paned on upper stories, often grouped • Large single-paned OR vertical multi-paned on ground floor	• Projecting OR angled awnings • Pedimented windows at ground level • Transoms • Storefronts may have bulkheads

* All of the standard characteristics shall be incorporated into the design of any building using this architectural style. Variations shall be subject to review and approval by the City.

3.4.4 Mediterranean Style Guidelines

The Mediterranean style is a good example of a transplanted style developed in a climate zone similar to the Southern California climate. This old-world prototype has been refined, adapted and embellished into a truly eclectic classic style. The shallow pitched hipped roof, often with decorative brackets, identifies this style.

Table 3.4: Mediterranean Style Guidelines

Elements	Standards*	Permitted Enhancements
Architectural Components	• Simple box, multi-story 'storefront' form with accent elements at entries • Precast surrounds	• Medallions • Niches • Decorative Vents
Roof Components	• Flat roof with parapets or mansards and cornice elements OR hip ancillary roofs • "S" concrete tile if applicable	• Closed/shaped eave with corbels at accent elements
Wall Materials	• Stucco finish	• Brick OR stone accents
Trim & Details	• Awning OR projecting feature accenting overall design such as arcades, towers and loggias	• Horizontal belt course • Cast stone surrounds, precast trim • Base trim • Tile accents • Wrought iron grilles
Windows	• Arched, round top, OR pedimented accent windows at selected locations	• Paneled OR louvered shutters

* All of the standard characteristics shall be incorporated into the design of any building using this architectural style. Variations shall be subject to review and approval by the City.

3.4.5 Agrarian Industrial Style Guidelines

The Agrarian Industrial style has grown out of the early colonial development in the 1700s. As the American Frontier moved westward, the Agrarian style evolved according to availability of materials and technological advancements. Modern day architects have adapted this style to have an industrial twist with standing seam metal roofs and asymmetry. Roof ornamentation is a characteristic detail consisting of cupolas or weathervanes.

Table 3.5: Agrarian Industrial Style Guidelines

Elements	Standards*	Permitted Enhancements
Architectural Components	• Simple box, multi-story 'storefront' form with accent elements at entries	• Protruding wood headers, decorative, exposed rafter tails • Wood posts with brackets
Roof Components	• Flat roof with parapets OR mansards OR gable OR shed roofs	• Wrought iron details, • Standing seam metal roofs • Couplas
Wall Materials	• Stucco finish	• Brick OR stone accents • Siding
Trim & Details	• Siding accents	• Siding accents
Windows		• Dormer window accents • Shutters • Divided lites

* All of the standard characteristics shall be incorporated into the design of any building using this architectural style. Variations shall be subject to review and approval by the City.

3.5 OFFICE DESIGN GUIDELINES

Architectural concepts developed for free-standing office buildings will reflect modern interpretations of classic design elements. For example, office buildings will evidence classical orders of architecture including pilasters, entablatures, and pedestals. Building features and elements are typically more massive and grand at lower levels, transitioning to smaller expressions at the upper levels, with attention to details such as cornices, multi-mullioned windows, and articulated moldings. The overall building organization and visual presentation may be symmetrical with axial entryways or non-symmetrical.

Figure 3.2: Conceptual "Class "A" Office Building Elevation

In general, office uses are recognized as autonomous occupancies and will not necessarily reflect architectural features or design elements evidenced elsewhere within the Piemonte Overlay. However, office land uses will be thematically tied to other land uses by common site features such as landscaping, lighting, streetscaping, and sign elements.

Site features within the Office Land Use area will evidence materials and material contrasts employed elsewhere in the Overlay. Walkways, plazas, and other surface treatments evidencing flora recalling the Piemonte region could provide additional visual cues tying office land uses to other areas of the Overlay. Landscaping within the Office Land Use area may continue Italian-influenced planting schemes and landscape arrangements employed throughout the Piemonte site. For example, at the pedestrian level, plantings in planting beds, raised containers, and pots may be provided. Light fixtures on the building faces, walkway light bollards, and street lights, as well as street furniture selections within office properties will heighten this theme.

It is also noted that prominent signs proposed along Ontario Center Parkway and Concours Street will identify and announce the Piemonte site, and by visual inference, will include all adjacent properties northerly of these roadways, including proposed office land uses. Signs for individual office uses may also employ signature design elements common to other areas and land uses within the Piemonte site.

The more massive Class “A” office building concept to be implemented is presented in Figure 3.2: Conceptual “Class “A” Office Building Elevation. These major office structures will be located adjacent to Ontario Center Parkway. Other, one-and-two-story office buildings will be located to the west and east, proximate to Concours Street. At a reduced scale, one-and-two story offices will interpret the Class “A” office design elements described above.

Figure 3.3: Photographs of Existing Office Buildings in the OCSP

3.6 SPECIAL USE/HOTEL DESIGN GUIDELINES

One hotel is allowed within the Piemonte Overlay located at the northeast corner of Ontario Center Parkway and Via Piemonte, immediately north of the Arena in Subarea 10. The hotel is constructed as an autonomous free-standing occupancy. The hotel architecture incorporates modern designs and materials selections similar to those employed for office uses. The hotel is thematically tied to the other land uses by such site features as common landscaping treatments, streetscape elements, and signage.

Site features within the Special Use/Hotel Land Use area include materials and material contrasts employed elsewhere in the Overlay. Landscaping within the Special Use/Hotel Land Use area continues southern Italian-influenced planting schemes and arrangements. For example, at the pedestrian level, generous plantings in both planting beds and raised containers and pots will include aromatics such as rosemary.

Additionally, at key locations and entrances, arbors and monument statements identify the hotel property as part of the Piemonte at Ontario Center. Walkways, plazas, and other surface treatments evidencing the themes of grapes and flora recalling Italy's Piemonte region provide additional visual cues which tie hotel land use to other areas.

It is also noted that prominent signs proposed along Ontario Center Parkway and Concours Street identify and announce the Piemonte Overlay, and by visual inference, will include the adjacent hotel property northerly of these roadways. Signs for hotel use may also employ signature design elements common to other areas and land uses within the Piemonte Overlay.

3.7 RESIDENTIAL GUIDELINES

3.7.1 Site Planning Criteria

The following site planning criteria should be treated as design guidelines for parcel site planning and community placemaking.

3.7.1.1. Planning for Active Spaces

- Building massing, design, and setbacks shall reinforce a pedestrian-scale for the street scene without generating unusable pockets or dead spaces.
- Buildings are encouraged to be built to the minimum setback line to create a continuous street edge.
- Buildings should be oriented toward streets, pedestrian pathways and/or active spaces.
- Where building design undulates, spaces along the pedestrian realm should be large enough to foster visual interest, but not too deep to disrupt the continuity of the street.
- Coordination between parcels is encouraged for building scale, massing, architecture, and pedestrian amenities.
- Open spaces and community facilities should be visible from adjacent dwellings to help promote site safety.

3.7.1.2 Privacy

Privacy is an important consideration in residential and mixed use site planning. Innovative site planning and design techniques should be used to preserve privacy while promoting social opportunities. In particular, windows of units should be located to minimize visual intrusion on neighbors' bedroom windows. Thoughtful and innovative techniques, including landscaping, should be incorporated where appropriate to provide privacy to residents.

3.7.1.3 Drive Aisle Treatments

Drive aisle areas have evolved from purely functional space to a space that residents experience daily, and may include front doors and garage access. Design of these areas shall address the functional and aesthetic features to create a pleasant experience for residents. At least three of the following shall be implemented along the parking areas:

- Massing offsets (layered wall planes, recesses or cantilevers) of at least 6 inches.
- Window trim, colors, and selected details from the front elevation.
- Pedestrian gates.
- Enhanced garage door patterns or finishes.
- Variety of garage doors using color or design elements.

Fire Department connections, sprinkler post indicator valves, fire hydrants, and standpipes will be installed and screened as required by NFPA 13, 24, and City of Ontario standards.

3.7.1.4 Trash Enclosures

- Refuse and recyclable materials storage areas shall be enclosed consistent with paragraph 6.01.010.F.4 Refuse Storage Areas of the Ontario Development Code, except that trash enclosures may be attached to structures.
- All refuse/recyclable materials areas, mechanical devices, and utility area screening shall be finished using materials, vocabulary, and details compatible with the surrounding architecture.
- Gates shall be view-obstructing and constructed of decorative tubular steel, painted to match or complement the adjacent buildings.
- All refuse/recyclable material enclosures shall be constructed with a solid roof to prevent exposure to wind and rainfall.

3.7.2 Residential Building Form and Massing

Building form and massing play a critical role in framing urban environments. Buildings should incorporate design and construction methods that add a human scale to the building massing and three dimensional detailing that casts shadows and creates visual interest on the facade.

- The highest level of articulation shall occur on the elevations facing the street or drive.
- All elevations shall include wall plane offsets to add visual interest consistent with the following:
    - Massing offsets (layered wall planes, recesses or cantilevers) of at least 6 inches.
    - Window trim, colors, and selected details from the front elevation.
- The overall composition of massing, scale, material, color, and design detail is more important than the level of articulation.
- Prominent vertical or horizontal building features may be used to accentuate key elements and provide variation in wall planes.
- Projections, overhangs, and recesses should be used to enhance shadow, articulation, and scale of primary edges.
- Architectural elements that create shadow, relief, and sheltered pedestrian areas, such as balconies, trellises, recesses, overhangs, awnings, stoops, and porches are encouraged.

3.7.2.1 Roofs

Roof forms contribute to the overall building design and have a large impact on the mass, scale, and design of the community where visible from the street level where visible.

- Roof design shall incorporate variation in roof forms such as an aesthetic combination of changes in plane, form, ridgelines, and/or heights appropriate to the architectural style.
- Roof forms, material, and fascia elements shall be consistent with the overall

design vocabulary of the building and should appear authentic.

- Variety in pitch (sculpted).
- Roof vents should be painted to match or contrast the color of the roof material.
- Fascia design should be complementary to the architectural vernacular.
- Skylights, if used, shall be designed as an integral part of the roof; "bubble" skylights are not permitted. Skylight framing materials should be bronze anodized or colored to match the adjacent roof materials.

3.7.2.2 Parapets

If parapets are used, one or more of the following detail treatments should be included:

- Pre-cast or simulated pre-cast elements.
- Contiguous banding or projecting cornice.
- Dentils.
- Caps.
- Corner details.

3.7.2.3 Materials and Detailing

Architectural detailing of building facades is a key feature of quality design. Special attention is required in the treatment of entries (doors, vestibules, porches, courtyards) using enhanced trim or details to emphasize these as primary focal points. Articulated or unique window treatments further enhance wall surfaces, can provide shade and wind protection, and contribute to the character of the neighborhood.

- All building elements, such as materials and color, detail elements (porches, balconies, courtyards, awnings, surface treatments, and materials), and functional elements (garage door lights, exterior stairs, guardrails, gutters, downspouts, screen walls, electrical enclosures, or similar features) should be integral to the buildings design, consistent with the architectural vernacular of the building, and complement the surrounding neighborhood.

- Construct buildings using quality materials to create a community of character and long-term value. A variety of materials and textures shall be incorporated within the design theme of the community.
- Durable, quality materials designed to appear as an integral part of the design shall be used.
- Material changes should occur at intersecting planes, preferably at inside corners of walls or other meaningful locations where architecture elements intersect.
- Garage doors should have varied door patterns, colors or finishes.

3.7.2.4 Functional Elements

- All roof-mounted equipment shall be screened from ground level view through the use of parapets or other effective architectural elements.
- Ground mounted equipment and meters shall be visually concealed and designed to not detract from the architecture of a building.
    - Air conditioning units shall be screened by walls or landscaping a minimum of 6 inches taller than the equipment and located away from project amenities, except when located in courts and lanes with limited or no screening.
    - Where possible, group equipment.
    - Electrical meters should be ganged and located behind doors.
    - Natural gas meters should be grouped.
- Mechanical devices such as exhaust fans, vents, pipes, gutters, and downspouts shall be painted to match adjacent surface, or colored to match accent colors.

3.7.2.5 Color Palette and Application

The color and materials palette should be selected with the design objectives of avoiding monotony, provide depth and interest with a variety of colorful schemes, and promoting visual diversity.

- Colors should complement the architectural style and overall color scheme

of the building.

- Selected finish materials should be appropriate in their use and application, be durable, and of high quality.
- Color blocking, or the use of multiple colors, should be used only where appropriate to the architectural style.
    - Changes should occur at logical termination points, generally at inside corners.
    - Field color used at the base of the building should continue down to the foundation or finished grade.
- Accent colors should be used on architectural features and ornamentation elements.
- Grout colors should harmonize and blend with the colors found in the stone rather than contrast with it.
- All exposed woodwork, beams, posts, railings, etc. should be colored to match the fascia.
- Trim colors on window trim and recesses should be complementary but discernible from the building color.

3.7.3 Contemporary Architectural Style

All residential buildings shall have a fresh and Contemporary style suited to the more urban setting within the OCSP area. Based heavily on the modern remodeling of warehouse spaces to contemporary and "hip" loft or flat spaces, this style is suited for dense residential buildings in neighborhoods that blend business, industry, and living in a single environment.

The Contemporary style includes simple and clean forms detailed with materials, projections and windows for indoor/outdoor living. The style emphasizes interlocking volumes with a collage of colors and materials. Architectural elements such as awnings, balconies, and trellises can be appended to the volumes, allowing indoor/outdoor spaces to be created. Vertical and horizontal elements provide interest to the residential structures. The roofs may be flat with parapets, sloped, or a combination of both. Windows should be placed in areas to overlook common areas and increase surveillance for these areas. Refer to Table 3.6: Residential Contemporary Style Guidelines.

Contemporary Elements:

- Plan form is more cubic, expressed in bold, simplified forms.
- Roofs are typically shielded by parapets and may have accent roof features such as curves, gables, hips or sheds.
- Wall materials typically consist of stucco, metal, brick, stone and/or siding; it is recommended that design be comprised of at least two different surface materials.
- Projections to articulate facades are typical and may include building wall planes, awnings, overhangs, canopies, window trim or accent roof forms.
- Braces in conjunction with projections are typical.
- Windows are typically a primary feature of the elevation; design sometimes includes groupings, unique size or shape or oversized and symmetrical mullions.
- Handrails and guardrails enhance the elevations.
- Color blocking is typical.

Table 3.6: Residential Contemporary Style Guidelines

Element	Standards*	Permitted Enhancements
Roof Components	• Flat roof with or without ledges OR shallow pitched roofs with broad low facing gables and hips • Simple unadorned OR detailed parapet walls • Concrete flat tiles • Wide eave overhangs OR no overhangs	• Accent roof features as appropriate • Signature towers OR vertical projections can extend above roof line • Varied roof heights • Shed roof • Cantilevered projections • Roof decks
Architectural Components	• Utilitarian and "edgy" • Simple, clean forms	• Projections OR wall planes articulate facade
Wall Materials	• Stucco, metal OR cementitious siding • Contrasting wall materials and textures	• Projections OR horizontal banding between floors • Asymmetrical facade • Horizontal OR vertical elements • Brick OR stone veneer • Metal accents • Concrete • Sunshades • Glass
Trim & Details	• Color blocking as appropriate	• Metal awnings OR overhangs • Metal, cable, glass OR panel balcony railings
Windows	• Variety of window patterns • Minimal trim	• Simple industrial dark window trim • Larger window modules • Long ribbons of windows sometimes wrapping around corners • Nontraditional window shapes and placements • Glass blocks • Round windows • Bay windows
Entries	• Understated	

* All of the standard characteristics shall be incorporated into the design of any building using this architectural style. Variations shall be subject to review and approval by the City.

3.8 LANDSCAPE

3.8.1 Landscape/Streetscape Design Guidelines

The Piemonte Overlay landscape concept merges the vineyard influences of the Piemonte region of northern Italy with contemporary low water-use plant material. Landscape patterns and street furniture create a harmonious, functional environment. Tall trees, such as towering palms, eucalyptus, and other drought tolerant trees, act as "way-finding" features and provide appropriate scale to the vertical urban environment. Broad, spreading canopy trees enhance and add variety to the streetscape walking experience will be rich in varieties of ornamental grass, succulents, and flower groundcovers creating this semi-arid and environmentally sustainable landscape environment.

Plant materials will be derived from an arid environmentally sustainable palette, including Eucalyptus, Olives, Oaks, and Palms. Areas of low water-use shrubs, groundcovers and ornamental grass shall also be employed where appropriate. Other major components of the Piemonte landscape/streetscape concept include pedestrian paths and sidewalks linking the Piemonte Overlay with surrounding areas. Refer to Figure 3.4: Characteristic Landscape Features.

Lighting will be employed throughout to highlight pedestrian areas, reinforce architectural character, and enhance safety and security. Thematic lights and light standards along major streets and within parking areas will act as defining and cohesive design elements, identifying properties as components of the Piemonte Overlay.

Other characteristic and defining design elements of the landscape/streetscape concept will include distinctive monumented entries, pedestrian amenities, and detailed accents such as potted plants. Enhanced paving and embossed/engraved surface treatments will be provided at key locations reinforcing a sense of place.

Characteristic examples of hardscape features to be provided within the Piemonte site are illustrated in Figure 3.5: Characteristic Streetscape Features.

Figure 3.4: Characteristic Landscape Features

Figure 3.6: Landscape Section Location Diagram identifies locations which provide illustrative examples of landscape/hardscape features. Subsequently, Figures 3-8 through 3-10 illustrate integration and application of these features within the Piemonte Overlay.

Entry Statements

Figure 3.9: Piemonte Overlay Entry Hierarchy identifies the locations and hierarchy of Overlay entries (Existing Primary, Secondary, and Tertiary and proposed project entries). Figures 3-11 through 3-13 illustrate the entry design

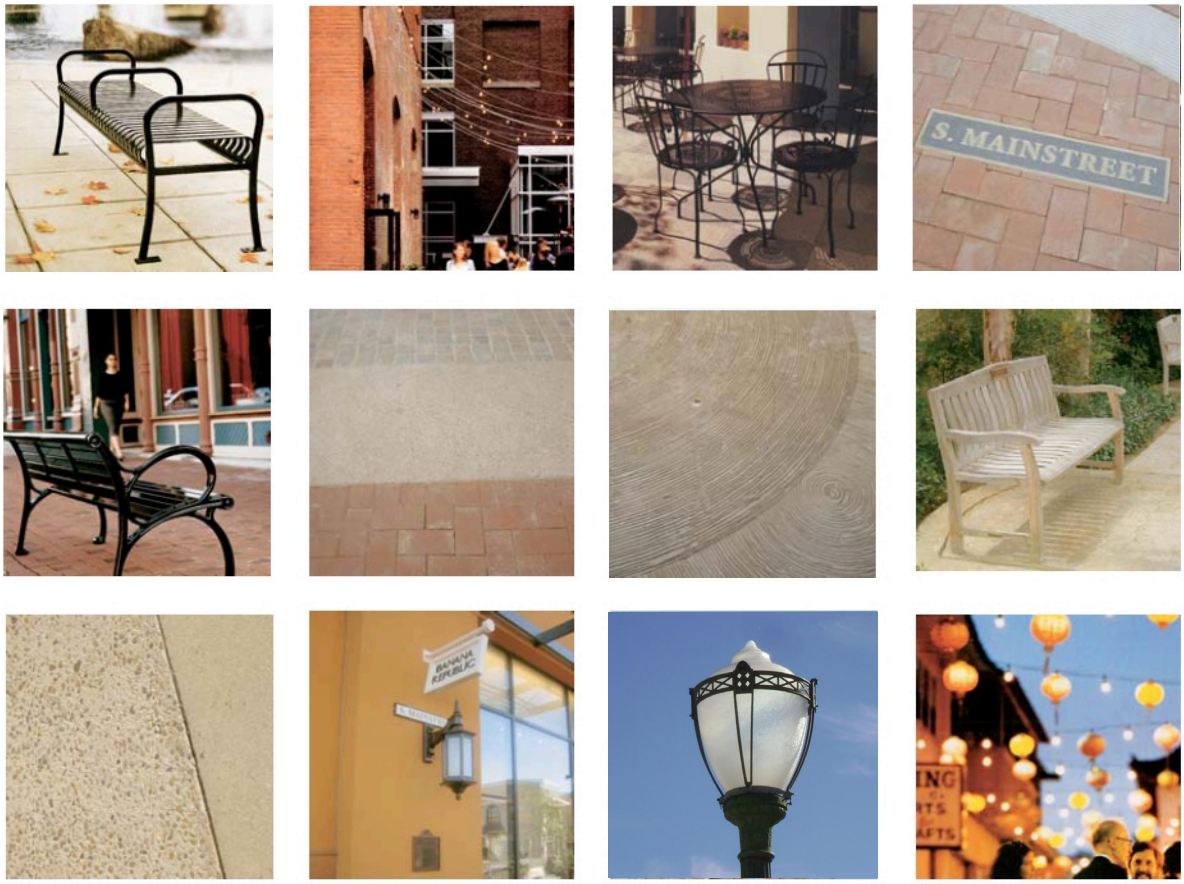


Figure 3.5: Characteristic Streetscape Features

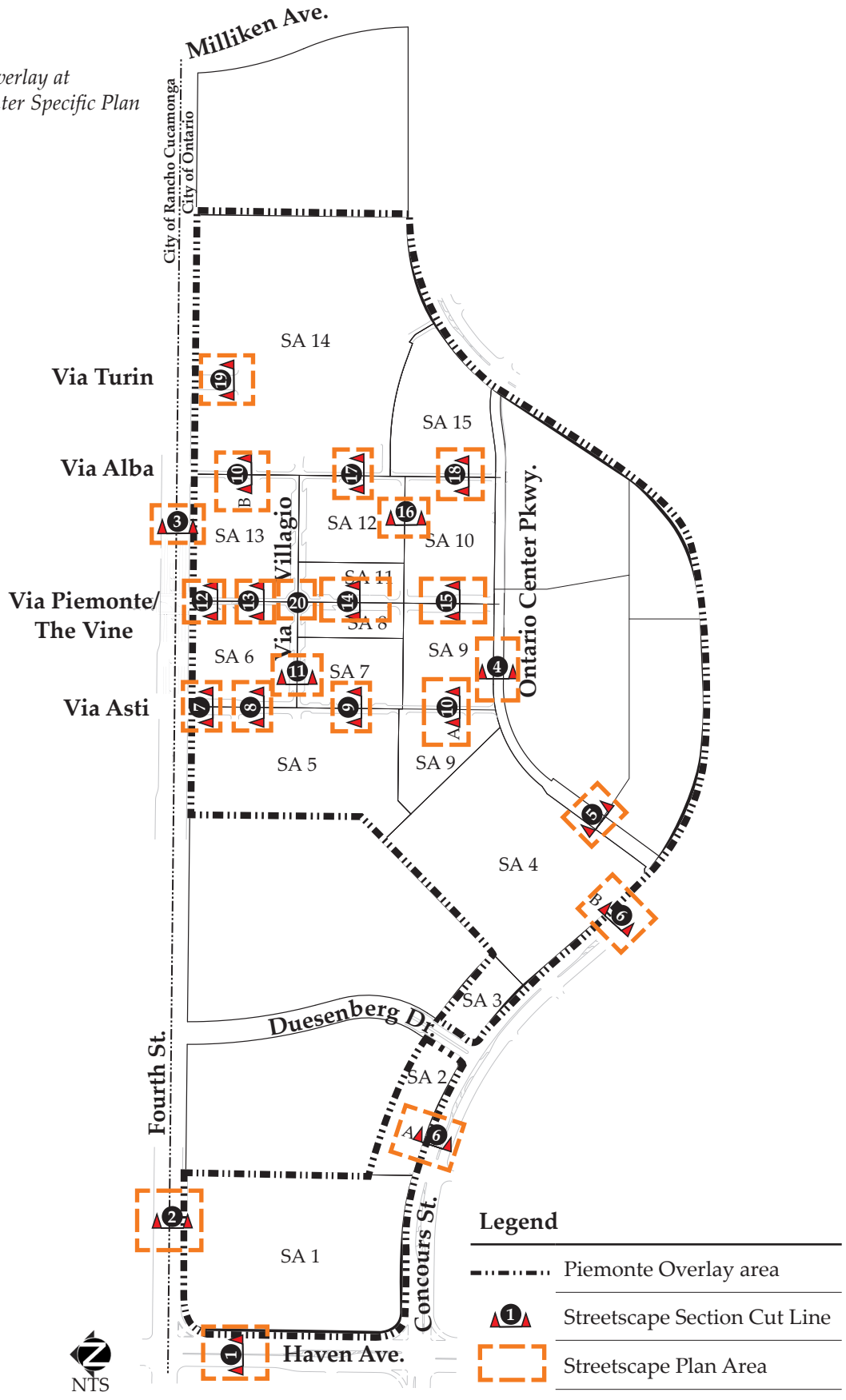
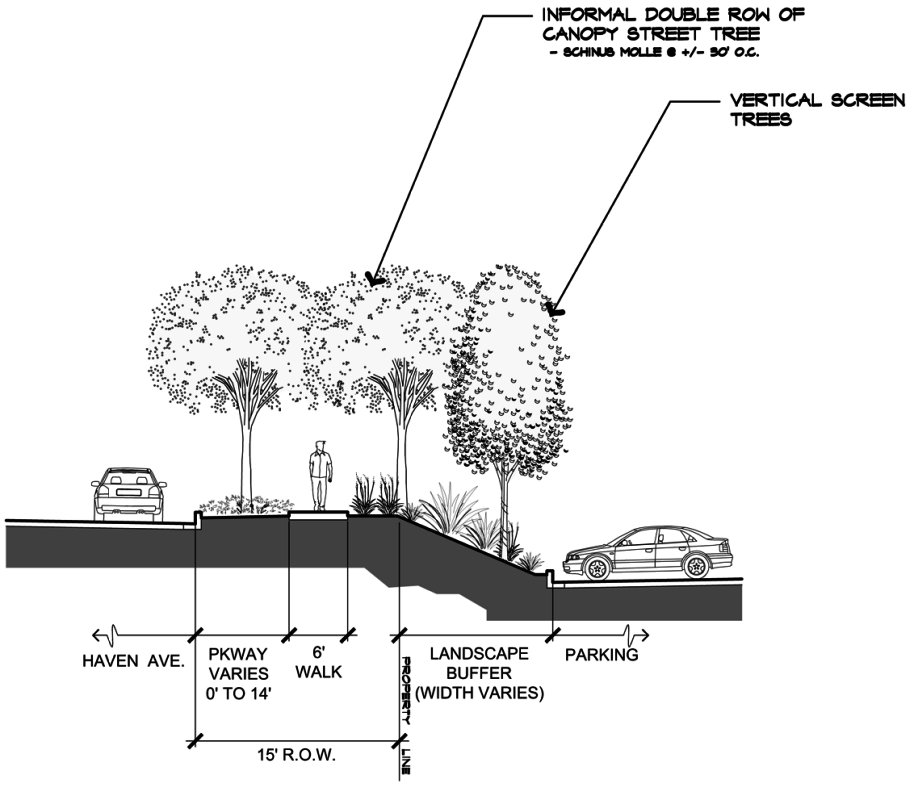
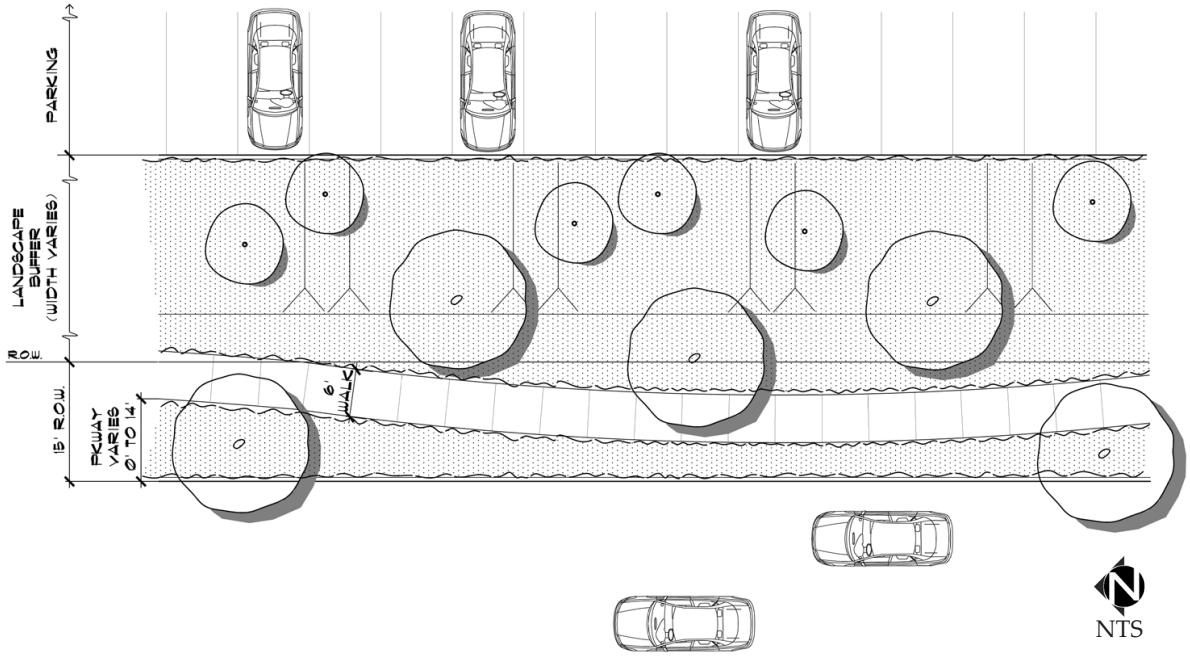


Figure 3.6: Landscape Section Location Diagram

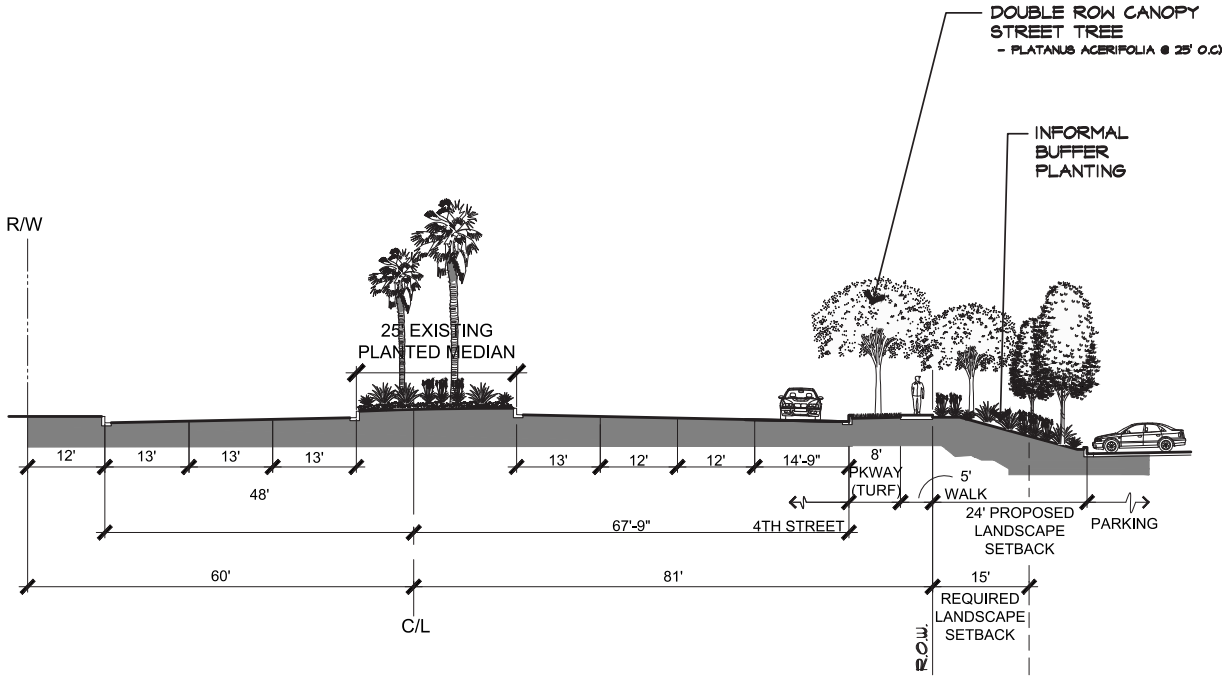


1. Haven Avenue Section

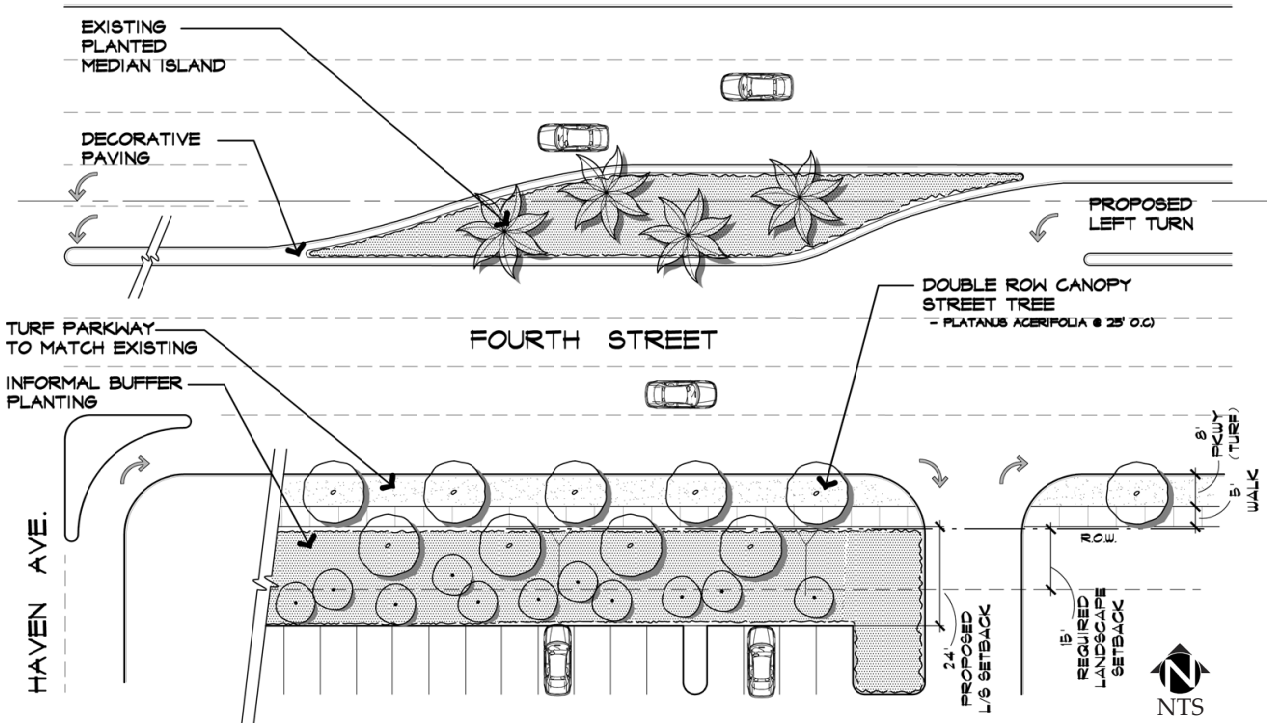


1. Haven Avenue Plan

Figure 3.7a: Haven Ave. Public Streetscape Section and Plan

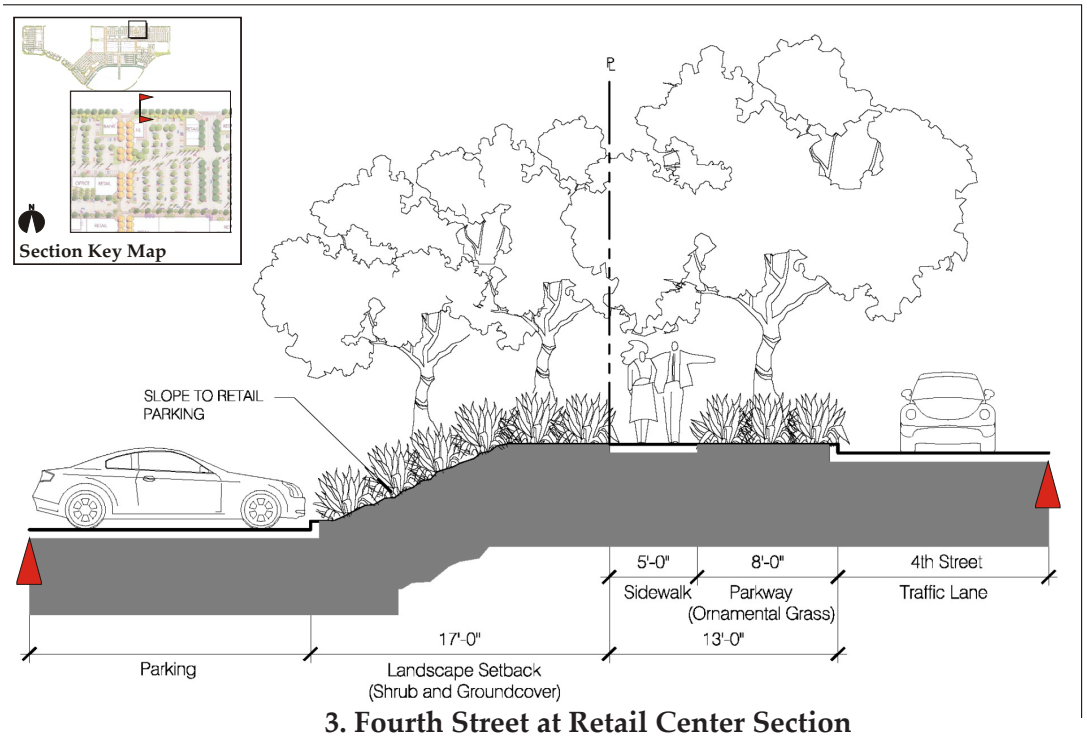


2. Fourth Street (East of Piemonte) Section

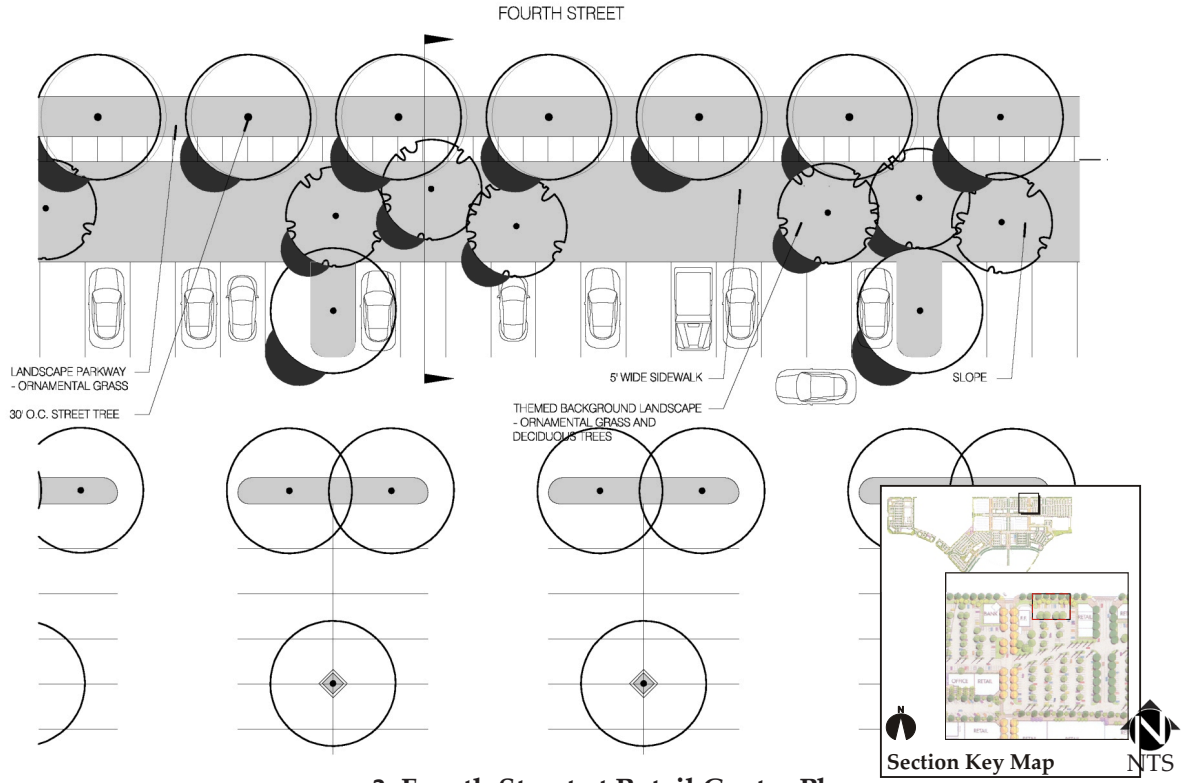


2. Fourth Street (East of Piemonte) Plan

Figure 3.7b: Fourth Street (East of Piemonte) Public Streetscape Section and Plan

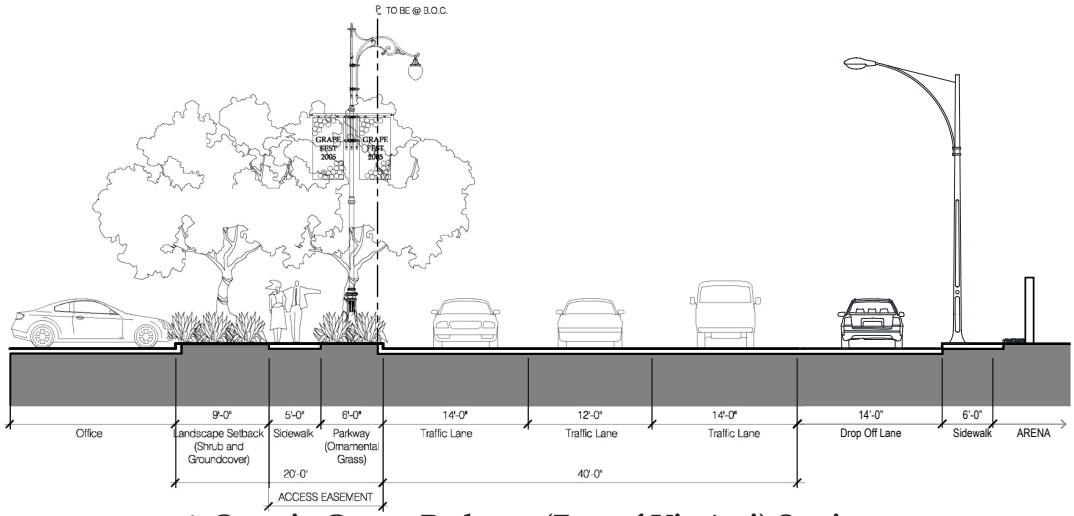


3. Fourth Street at Retail Center Section

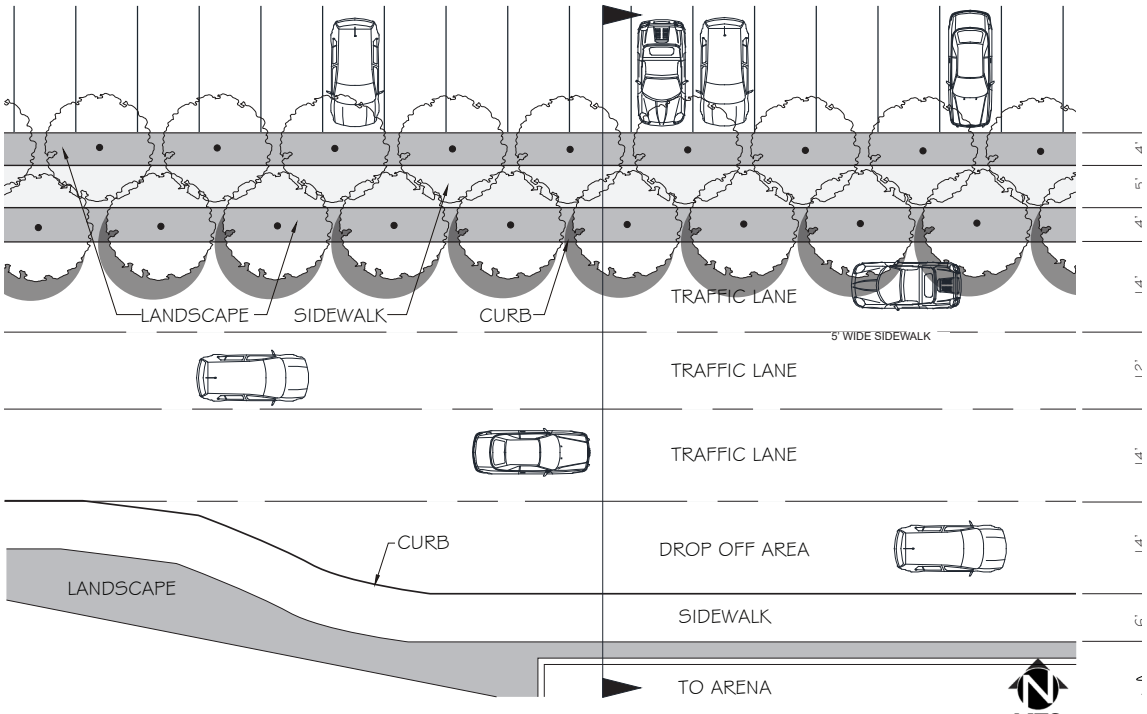


3. Fourth Street at Retail Center Plan

Figure 3.7c: Fourth Street at Retail Center Public Streetscape Section and Plan

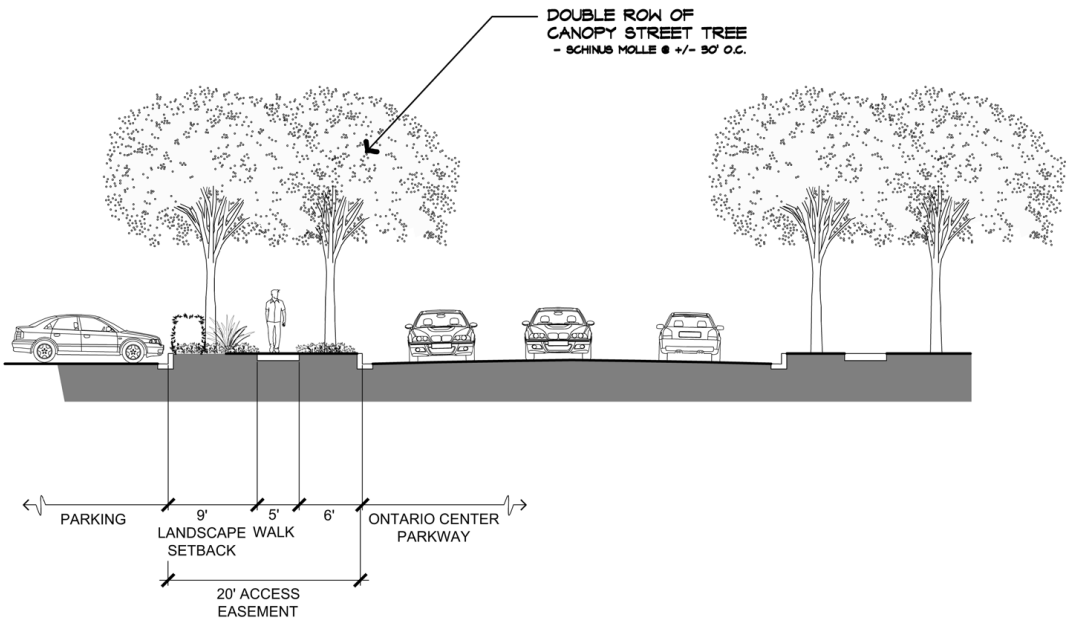


4. Ontario Center Parkway (East of Via Asti) Section

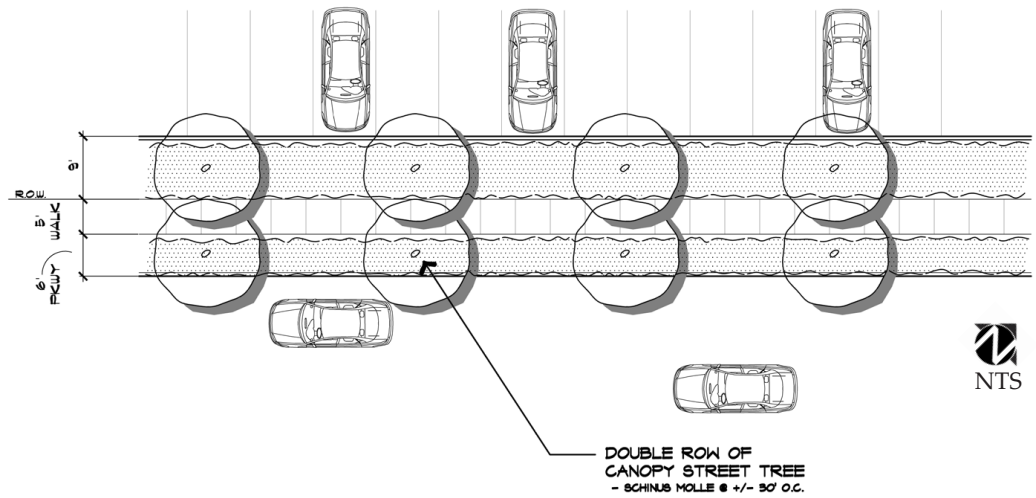


4. Ontario Center Parkway (East of Via Asti) Plan

Figure 3.7d: Ontario Center Parkway (East of Via Asti) Public Streetscape Section and Plan

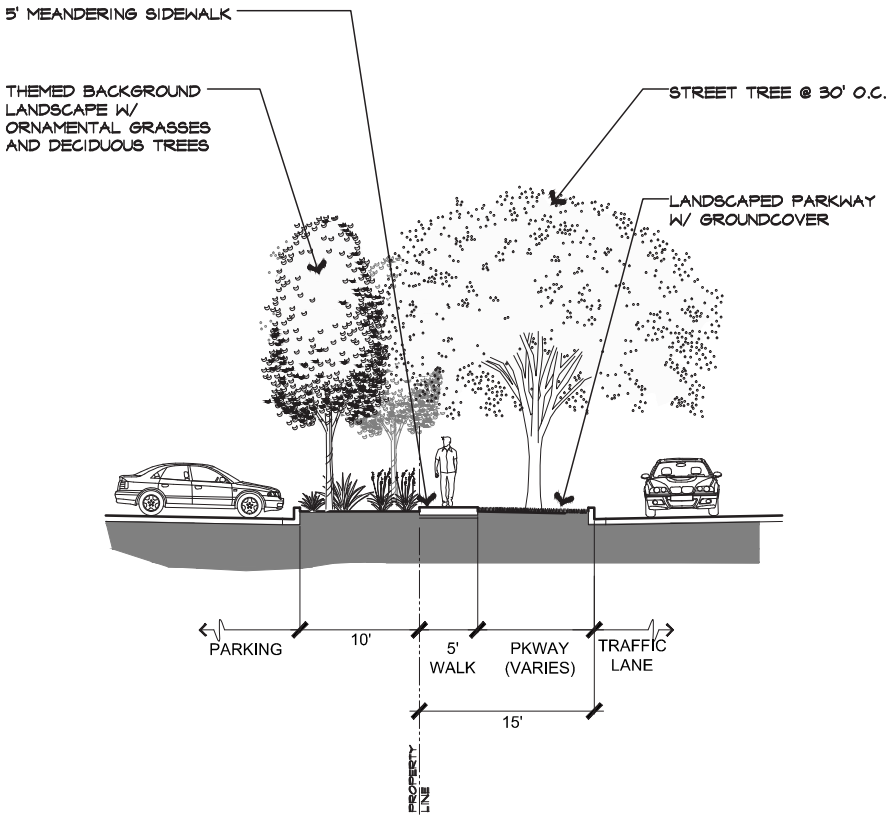


5. Ontario Center Parkway (West of Via Asti) Section

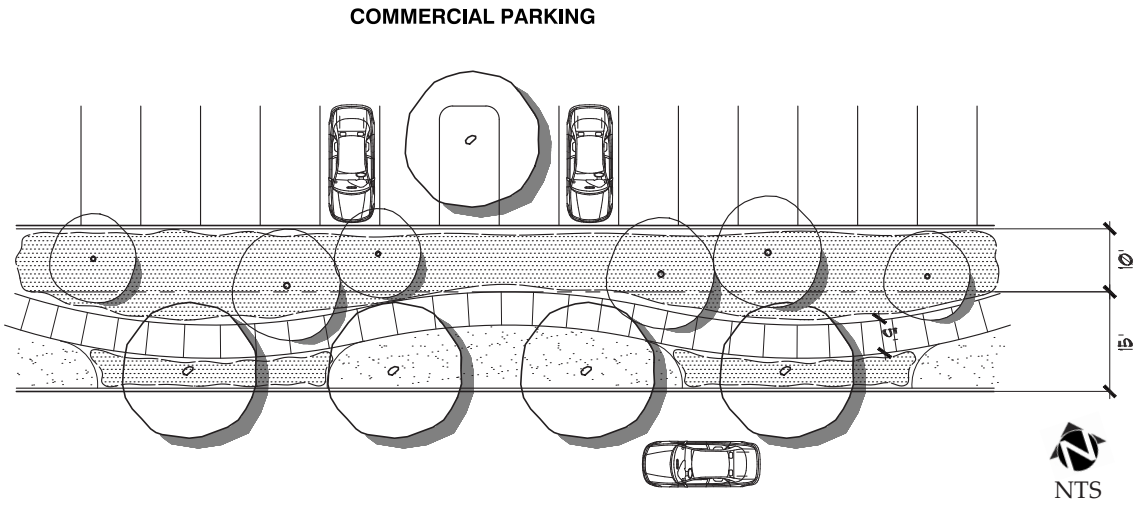


5. Ontario Center Parkway (West of Via Asti) Plan

Figure 3.7e: Ontario Center Parkway (West of Via Asti) Public Streetscape Section and Plan

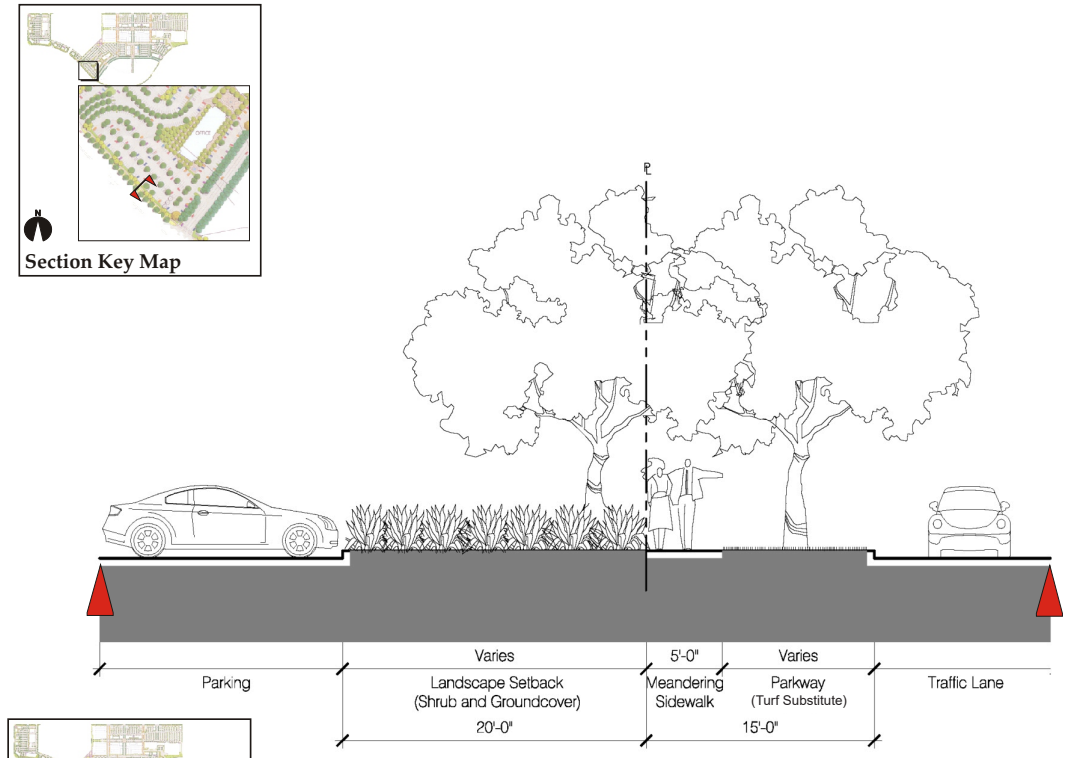


6A. Concours Street (West of Duesenberg Dr.) Section

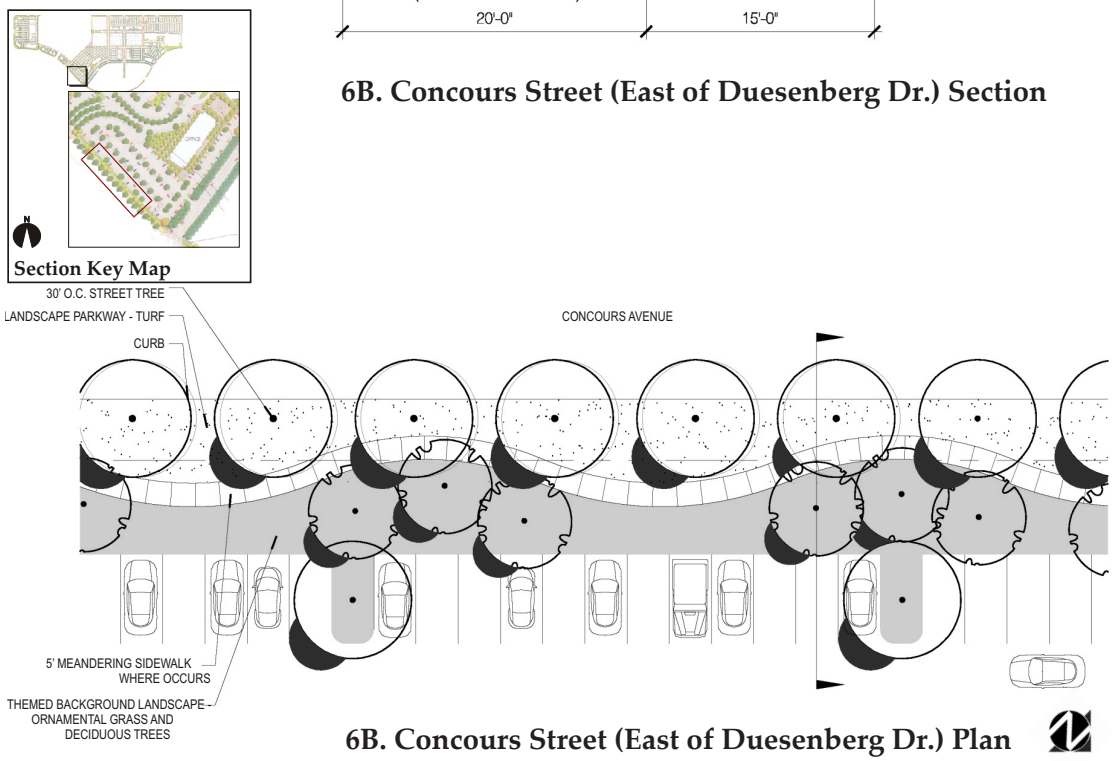


6A. Concours Street (West of Duesenberg Dr.) Plan

Figure 3.7f: Concours Street (West of Duesenberg Dr.) Public Streetscape Section and Plan



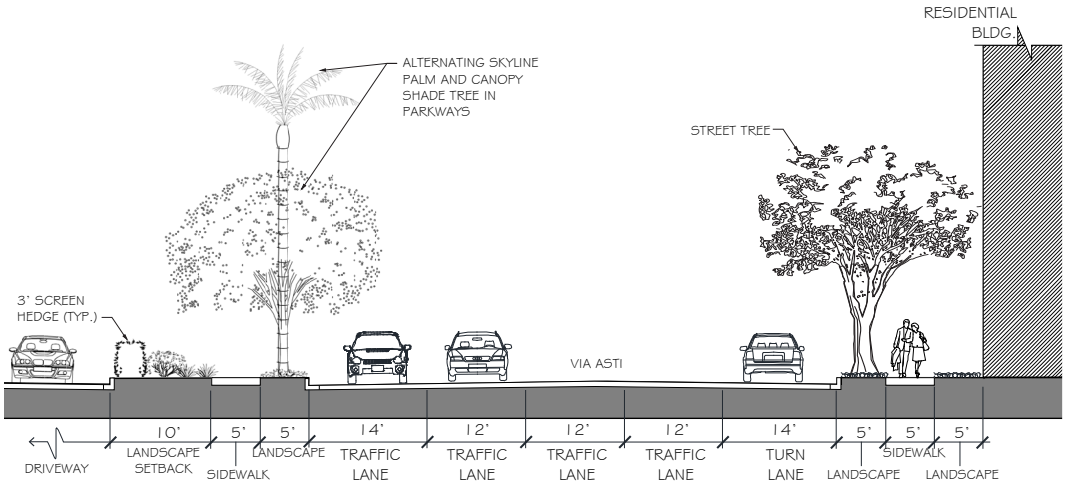
6B. Concours Street (East of Duesenberg Dr.) Section



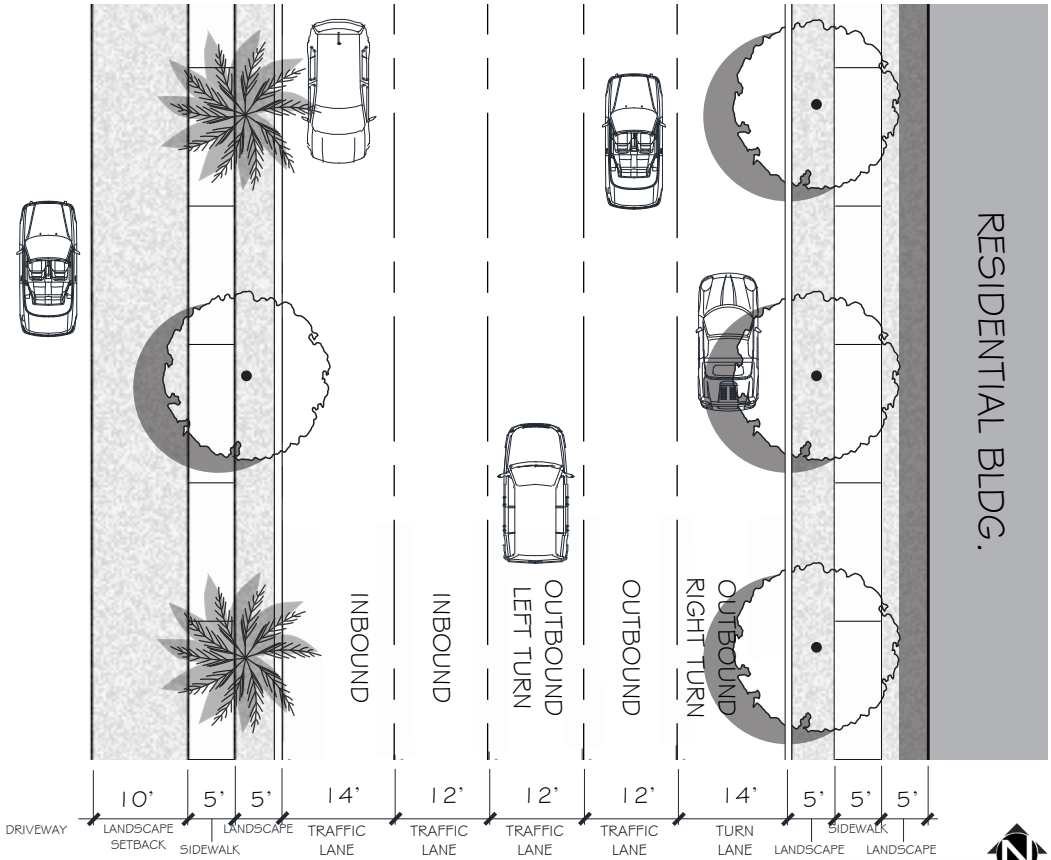
6B. Concours Street (East of Duesenberg Dr.) Plan

NTS

Figure 3.7g: Concours Street (East of Duesenberg Dr.) Public Streetscape Section and Plan

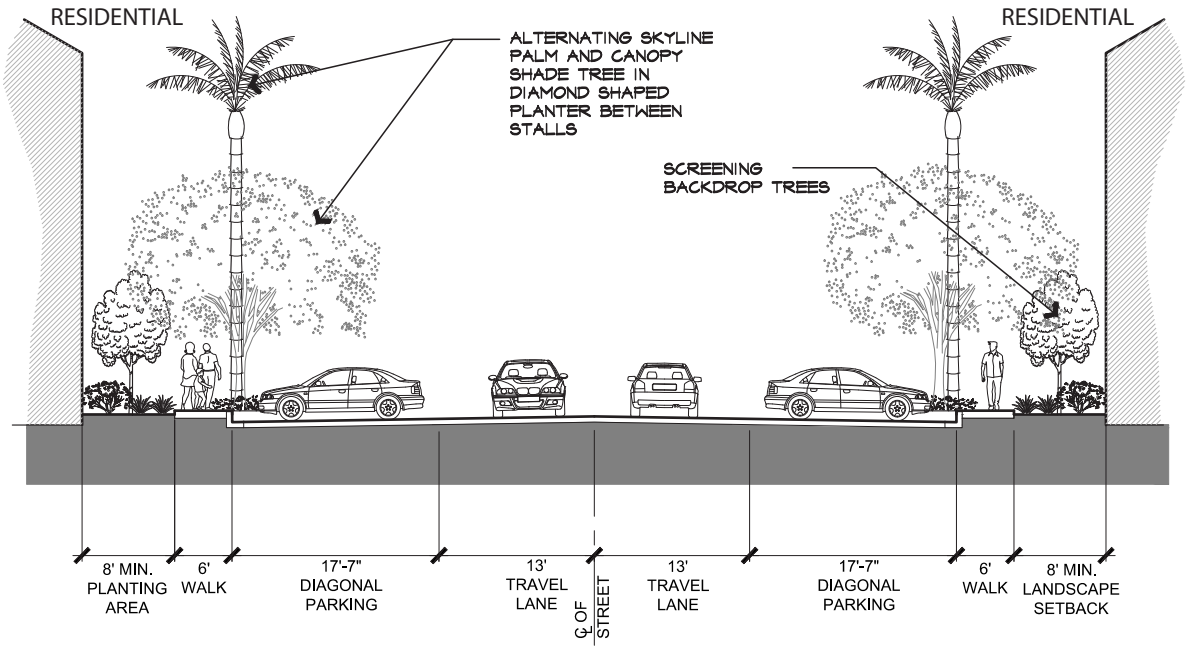


7. Via Asti - North Section (North Entrance) Section

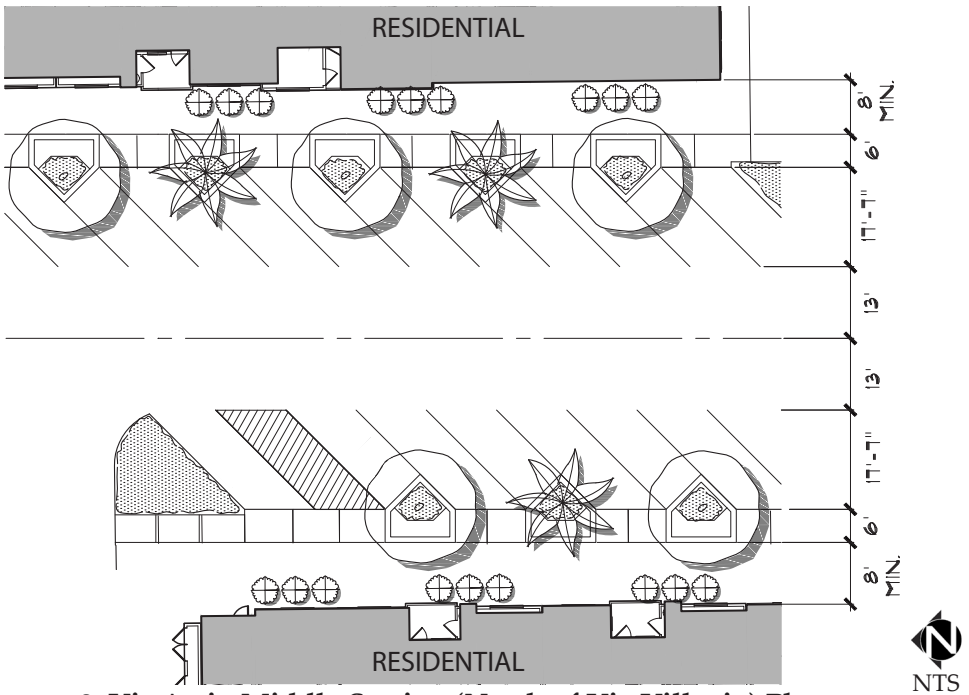


7. Via Asti - North Section (North Entrance) Plan

Figure 3.8a: Via Asti - North Section (North Entrance) Private Streetscape Section and Plan

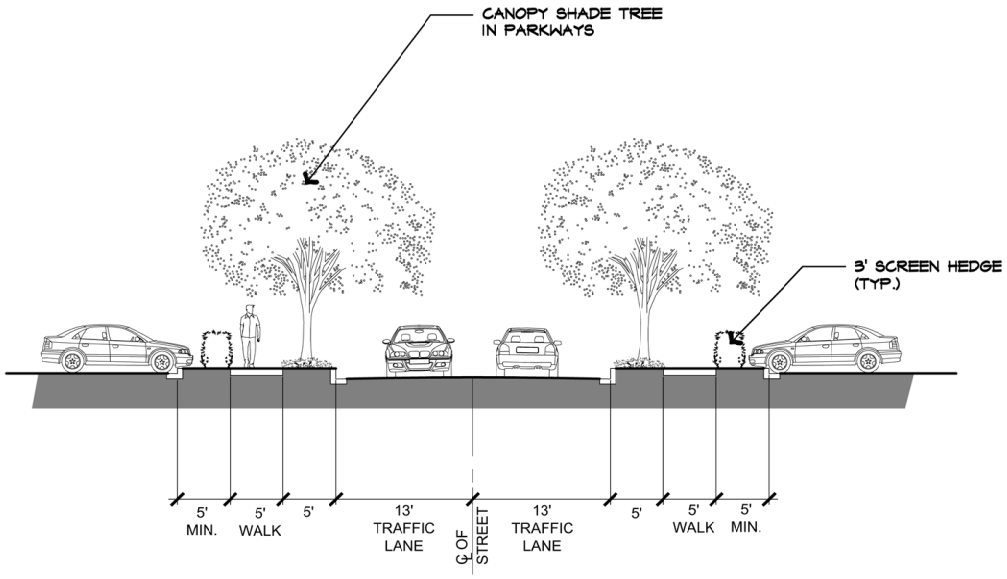


8. Via Asti - Middle Section (North of Via Villagio) Section

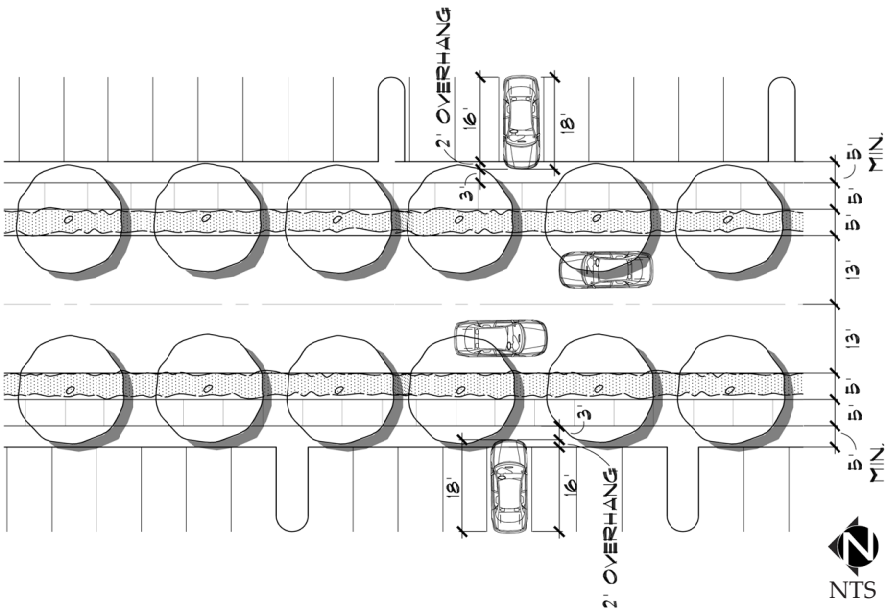


8. Via Asti - Middle Section (North of Via Villagio) Plan

Figure 3.8b: Via Asti - Middle Section (North of Via Villagio) Private Streetscape Section and Plan

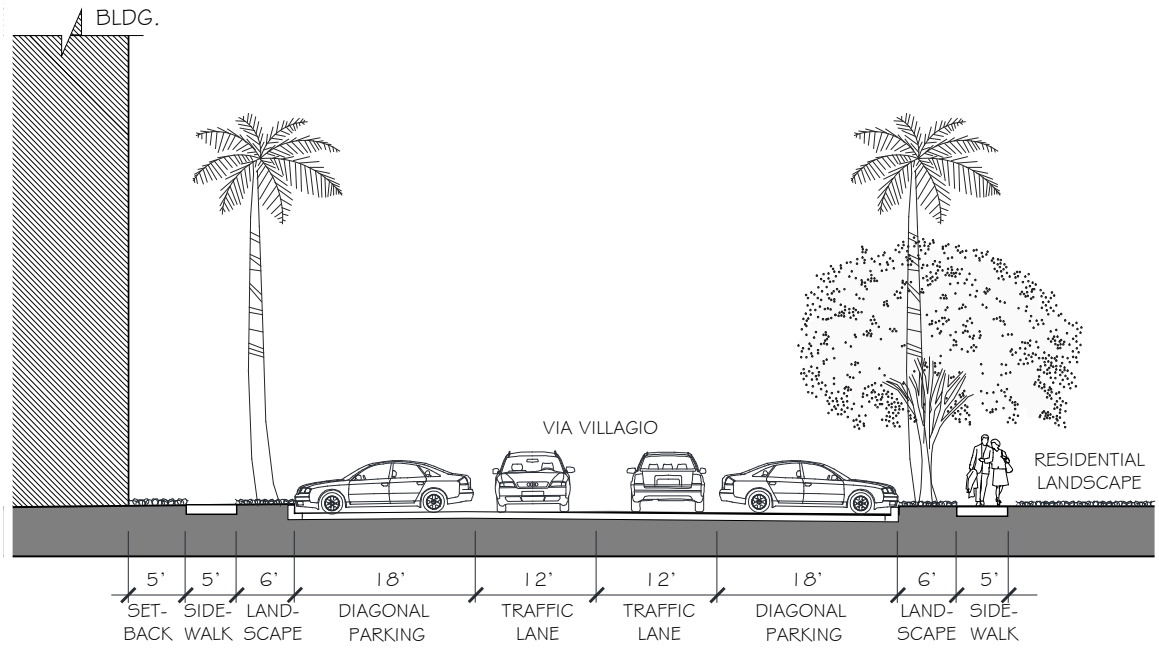


9. Via Asti - South Section (North of Ontario Center Parkway)

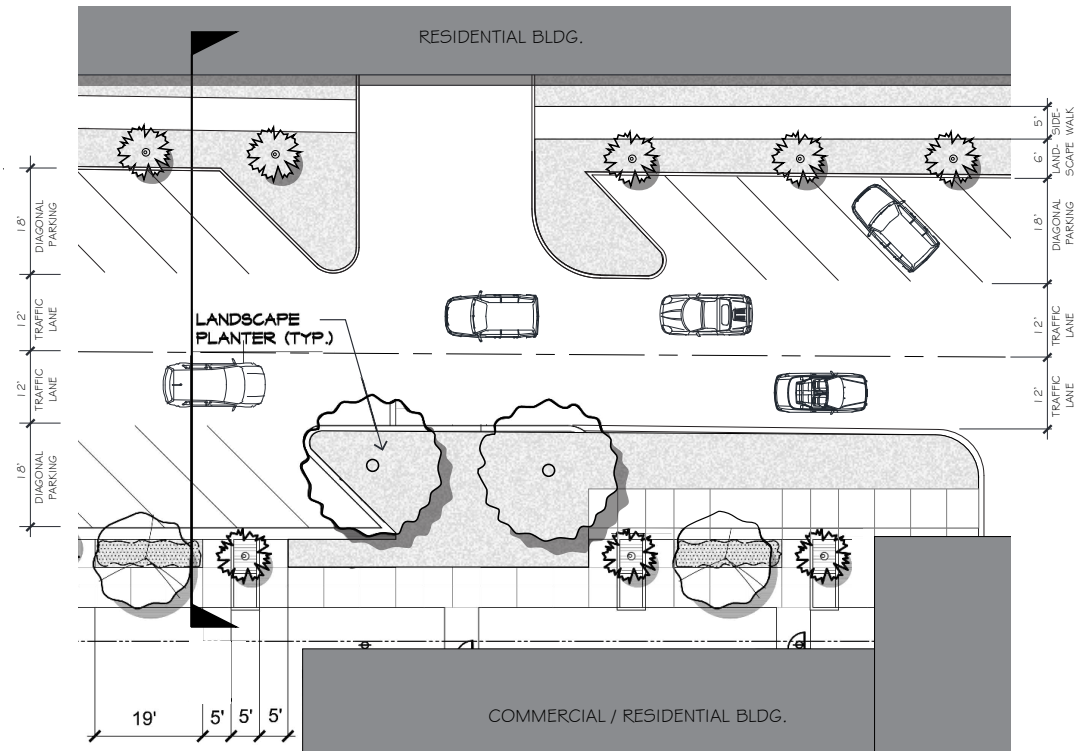


9. Via Asti - South Section (North of Ontario Center Parkway)

Figure 3.8c: Via Asti - South Section (North of Ontario Center Parkway) Private Streetscape Section and Plan



10. Via Villagio Section



10. Via Villagio Plan

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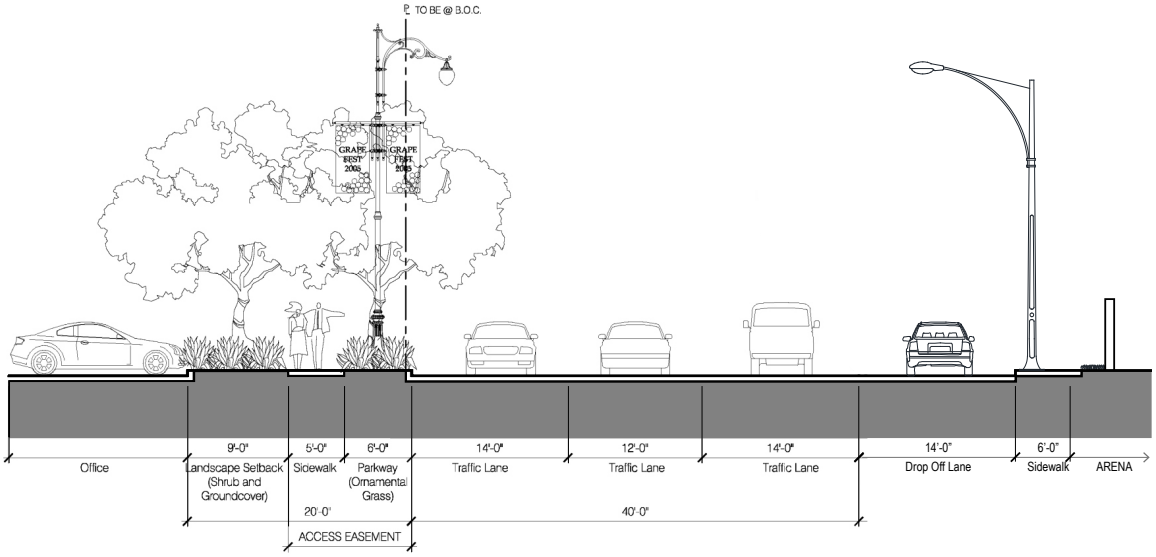
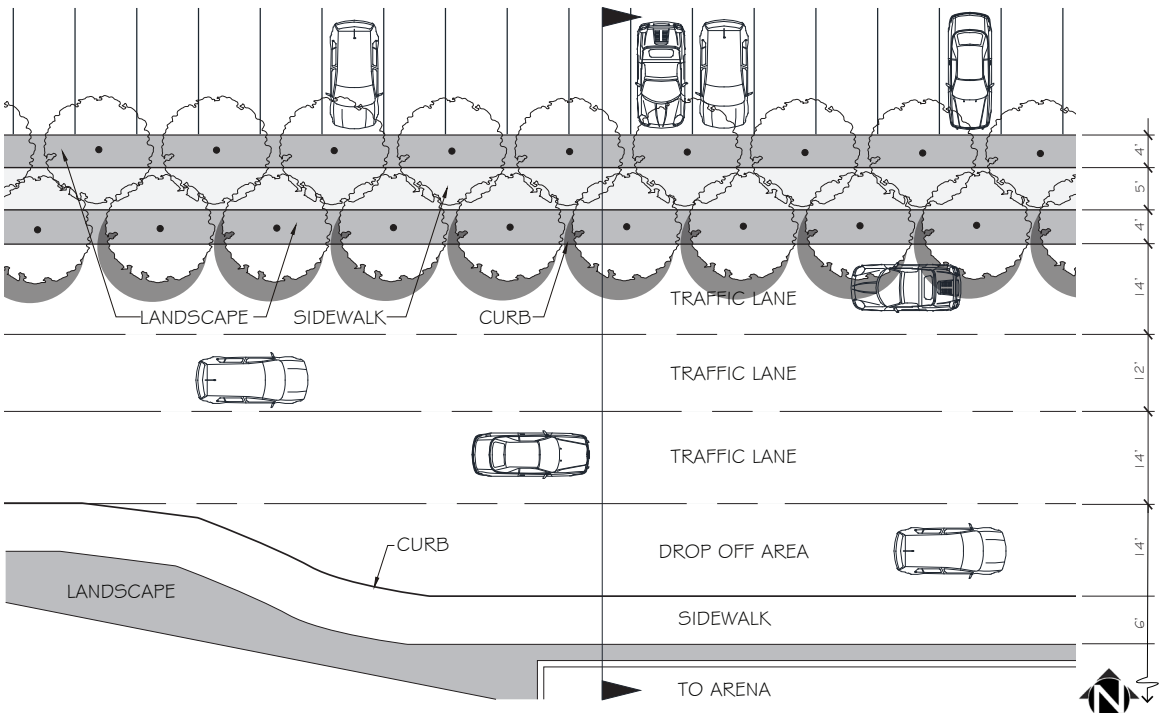
Figure 3.8d: Via Villagio Private Streetscape Section and Plan



11. Ontario Center Parkway (East of Via Asti) Section



11. Ontario Center Parkway (East of Via Asti) Plan

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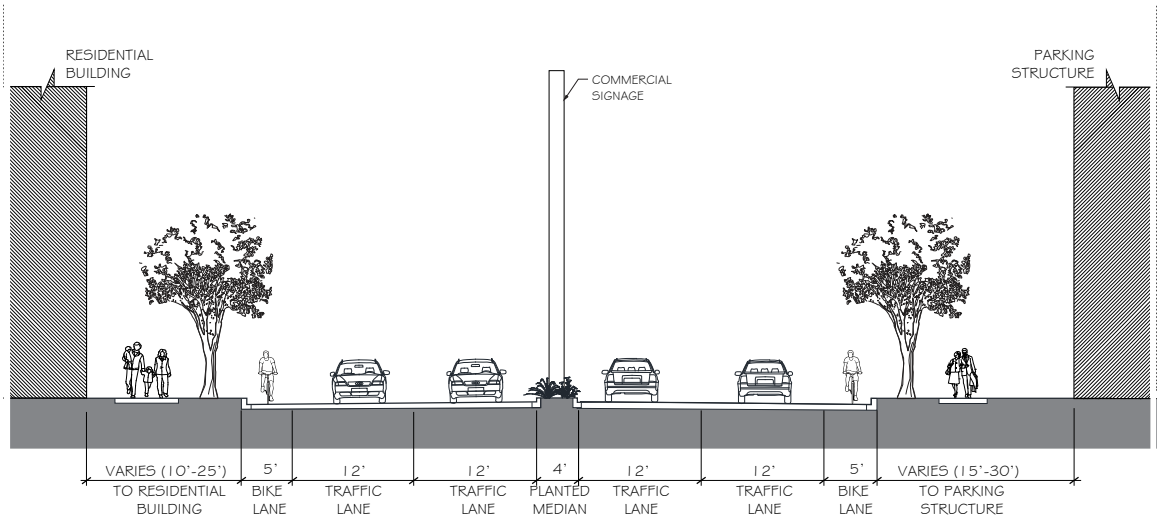
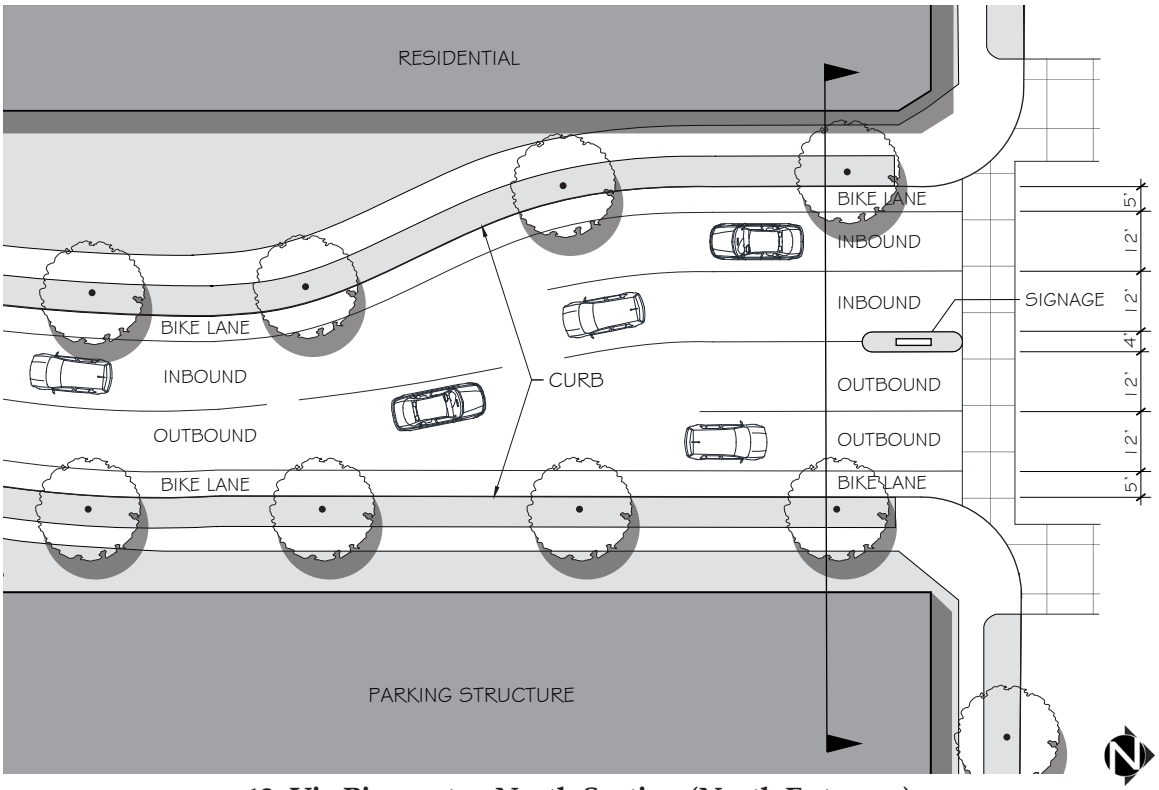
Figure 3.8e: Ontario Center Parkway (East of Via Asti) Public Streetscape Section and Plan

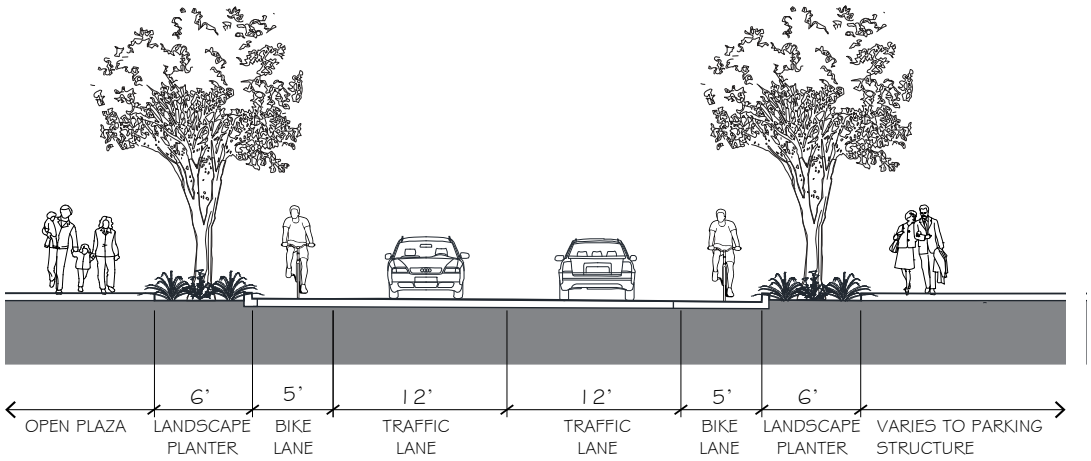


12. Via Piemonte - North Section (North Entrance)

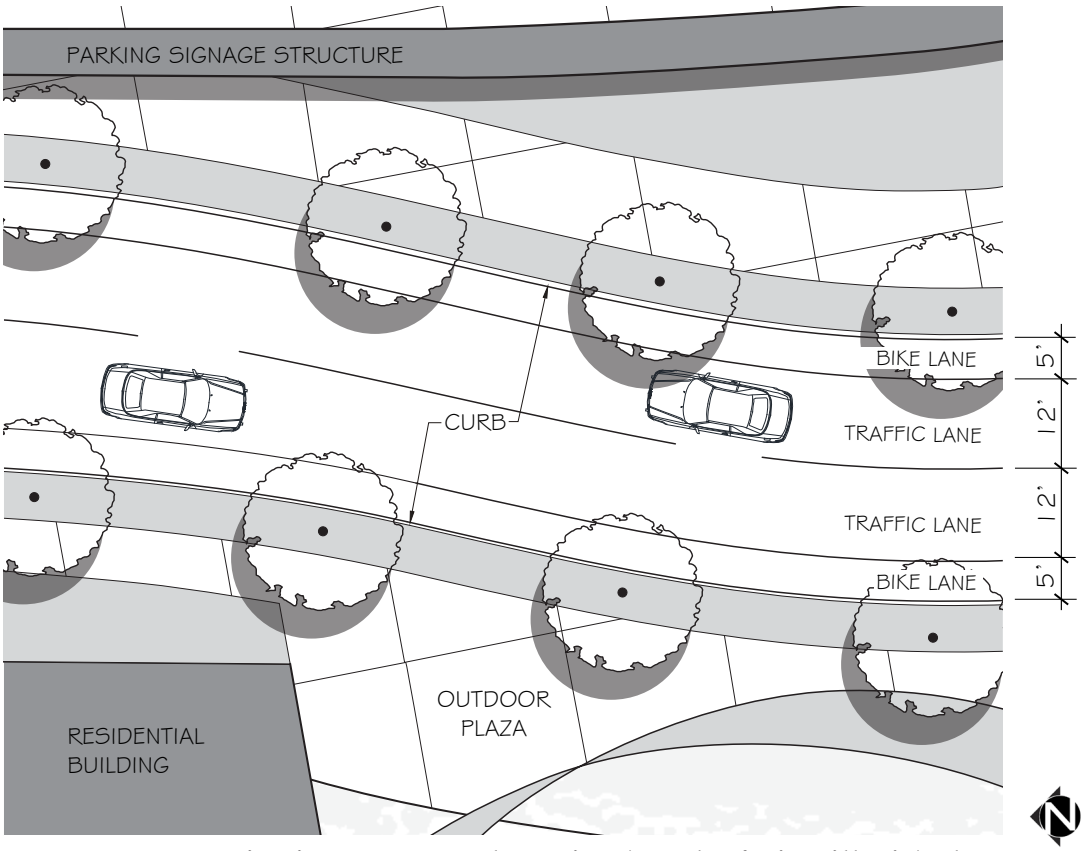


12. Via Piemonte - North Section (North Entrance)

Figure 3.8f: Via Piemonte - North Section (North Entrance) Private Streetscape Section and Plan

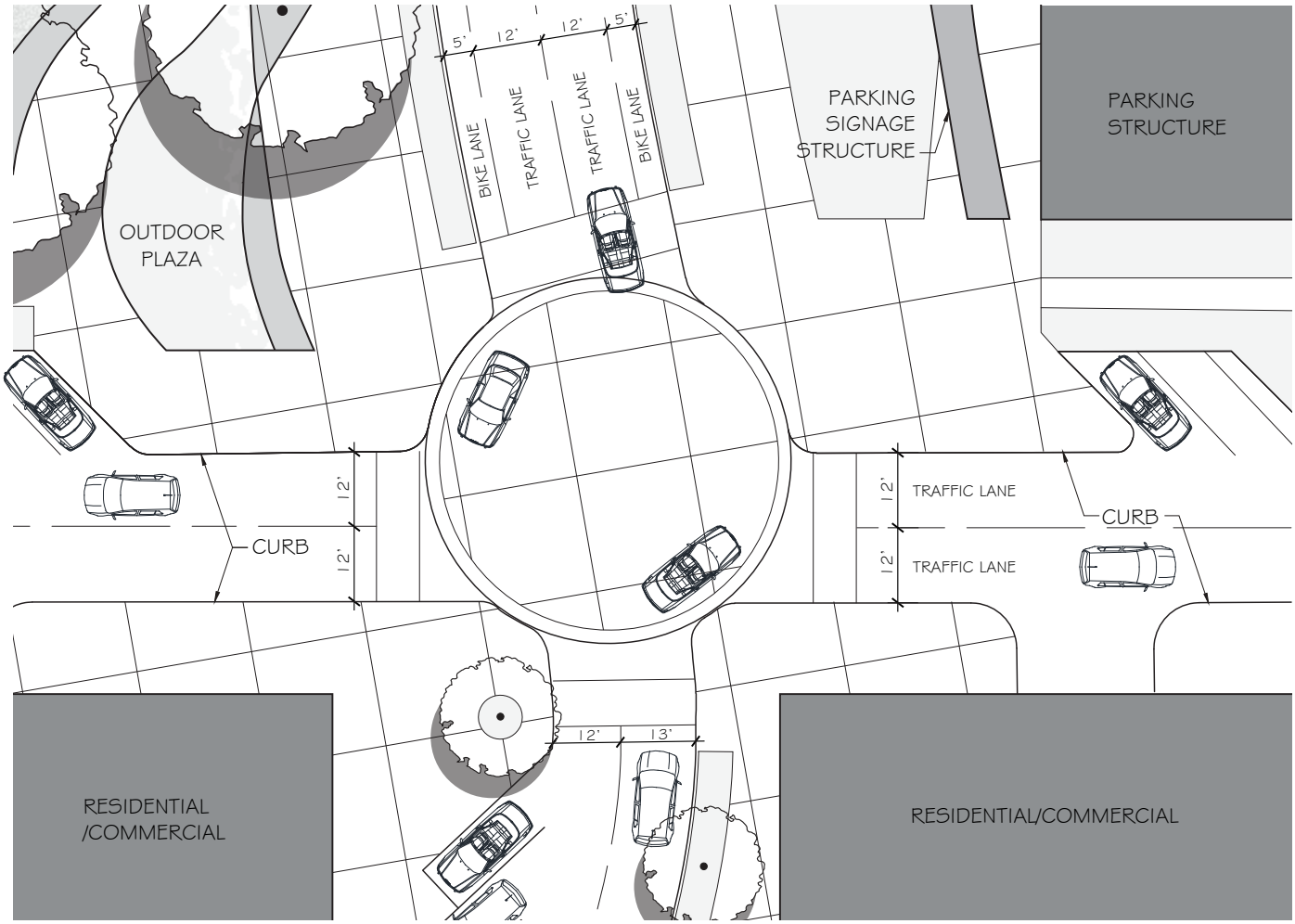


13. Via Piemonte - North Section (North of Via Villagio) Section



13. Via Piemonte - North Section (North of Via Villagio) Plan

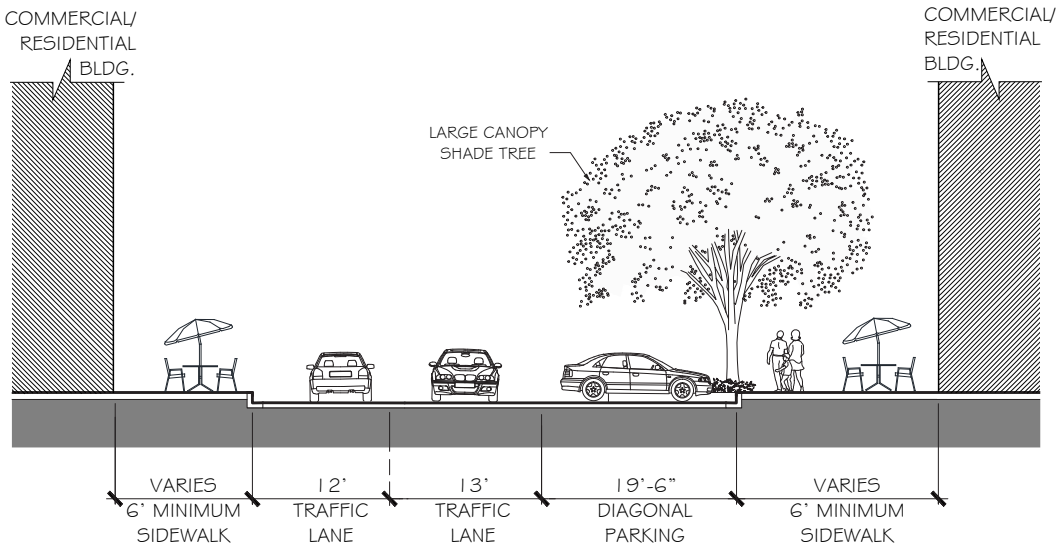
Figure 3.8g: Via Piemonte - North Section (North of Via Villagio) Private Streetscape Section and Plan



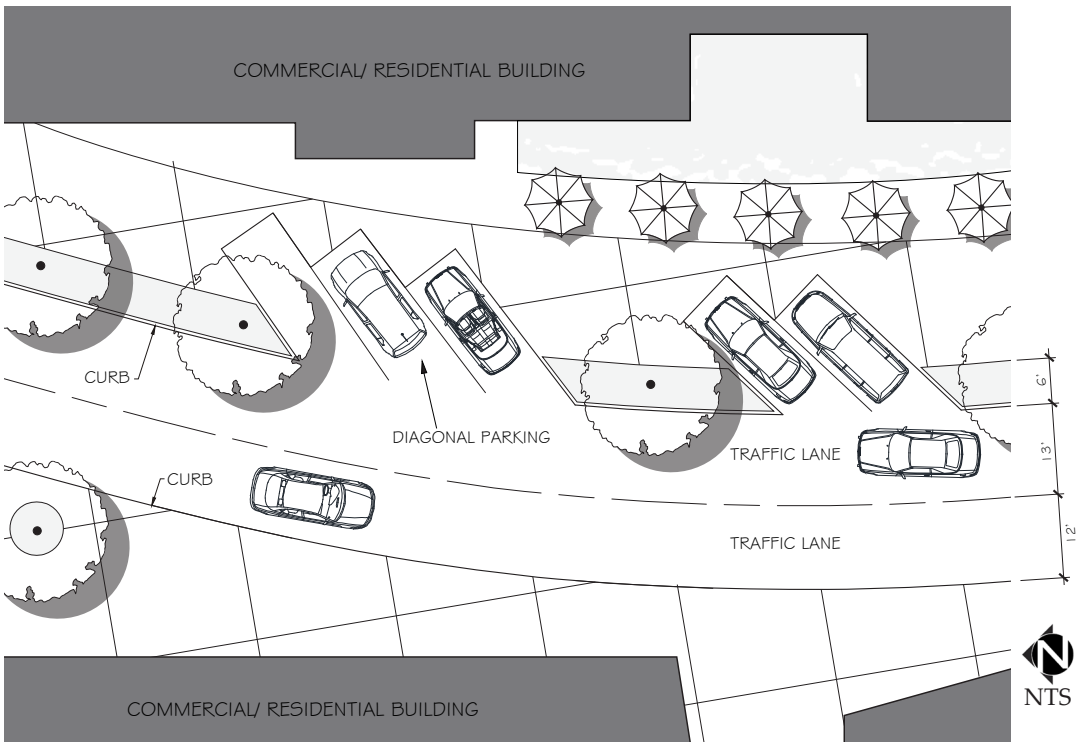
14. Via Villagio Roundabout Plan

NTS

Figure 3.8h: Via Villagio Roundabout Private Streetscape Plan

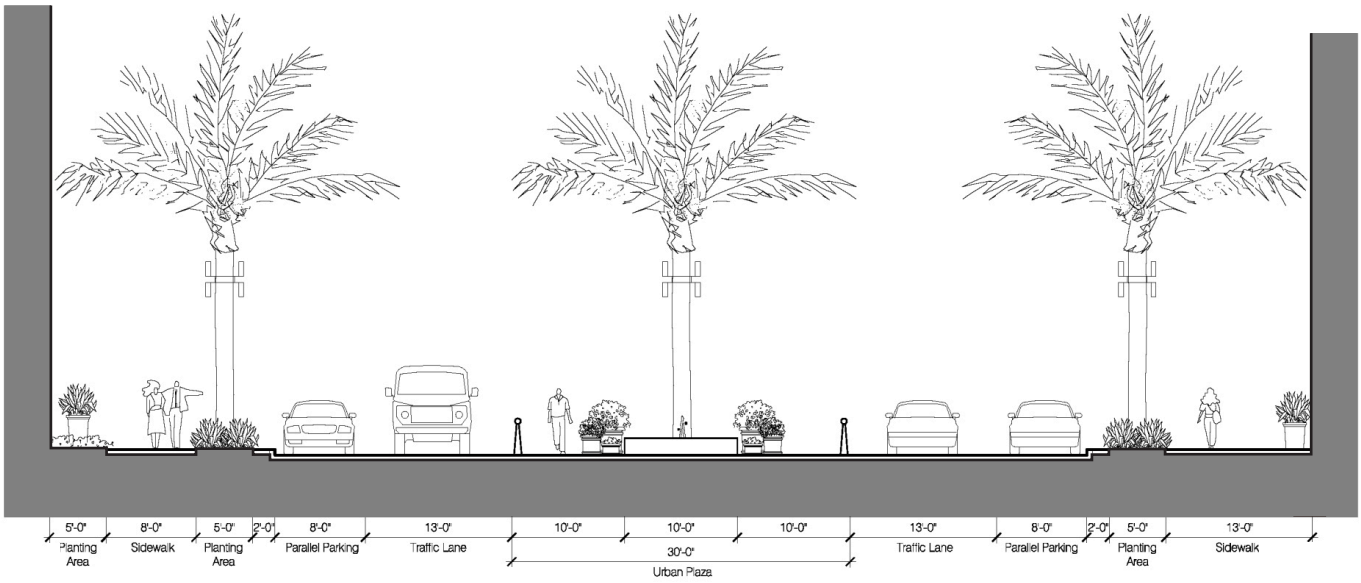


15. Via Piemonte - Middle Section (South of Via Villagio) Section

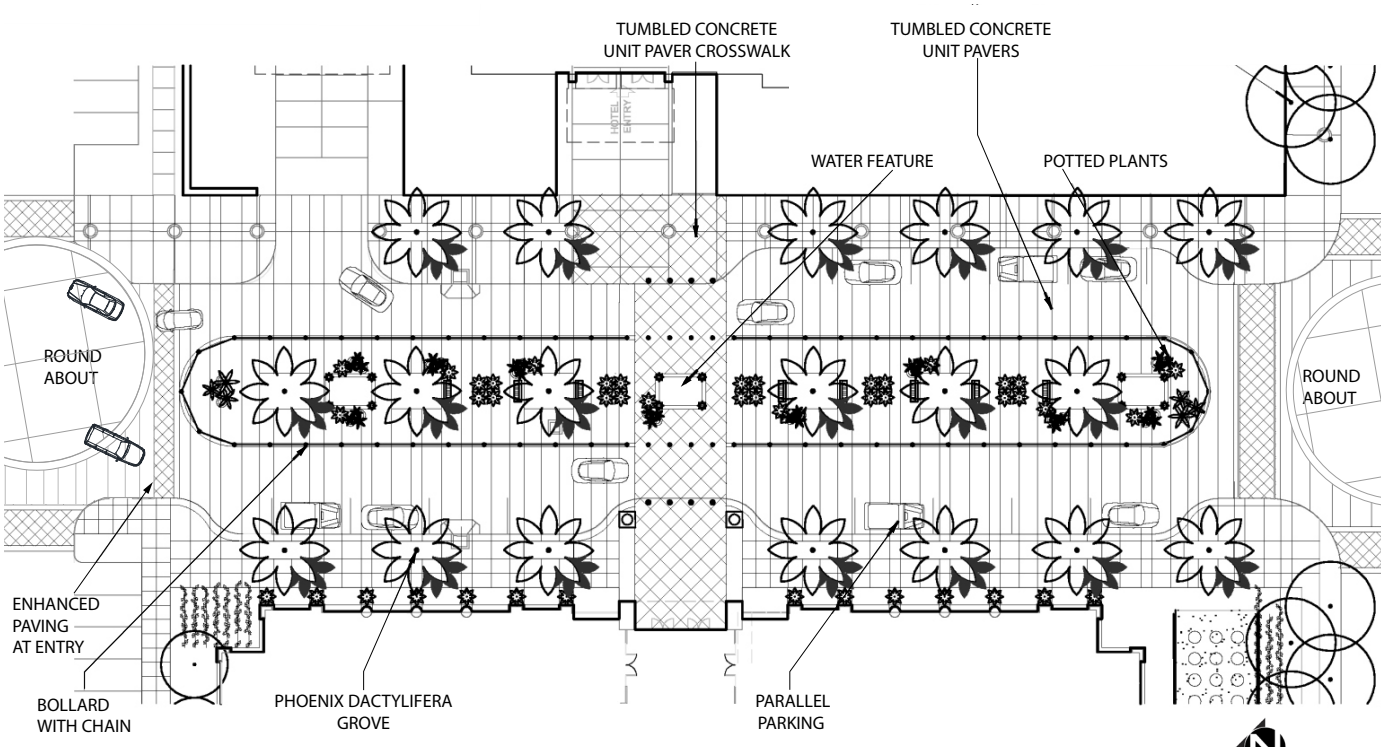


15. Via Piemonte - Middle Section (South of Via Villagio) Plan

Figure 3.8i: Via Piemonte - Middle Section (South of Via Villagio) Private Streetscape Section and Plan

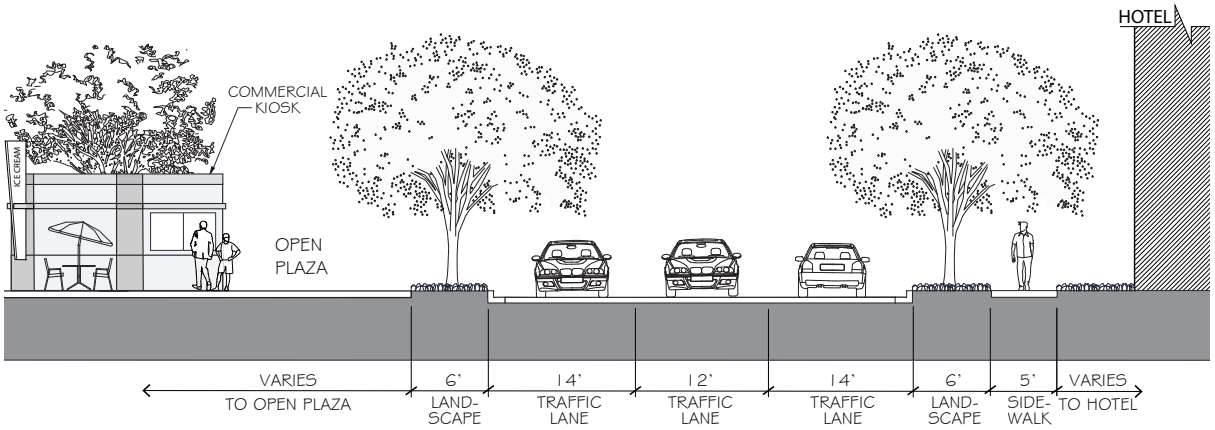


16. Via Piemonte - South Section (North of Ontario Pkwy) Section

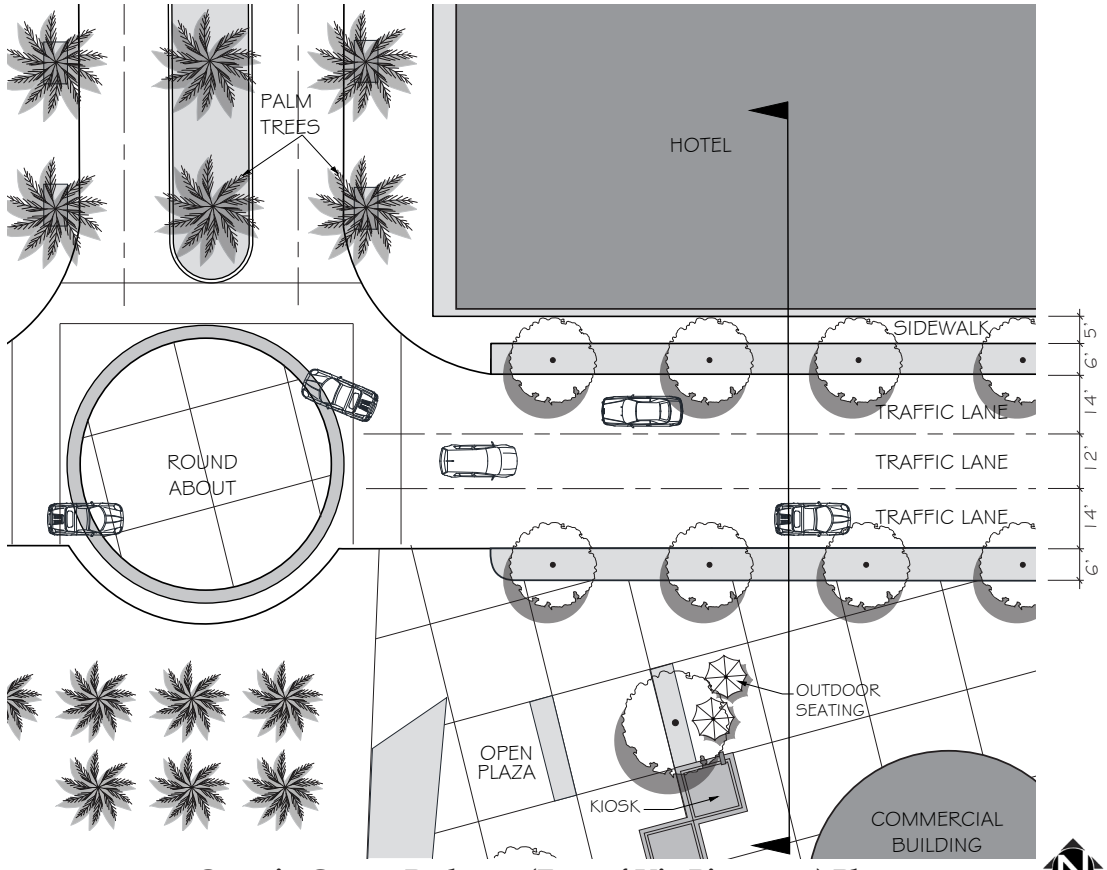


16. Via Piemonte - South Section - (North of Ontario Center Pkwy) Plan

Figure 3.8j: Via Piemonte - South Section - (North of Ontario Center Pkwy) Private Streetscape Section and Plan

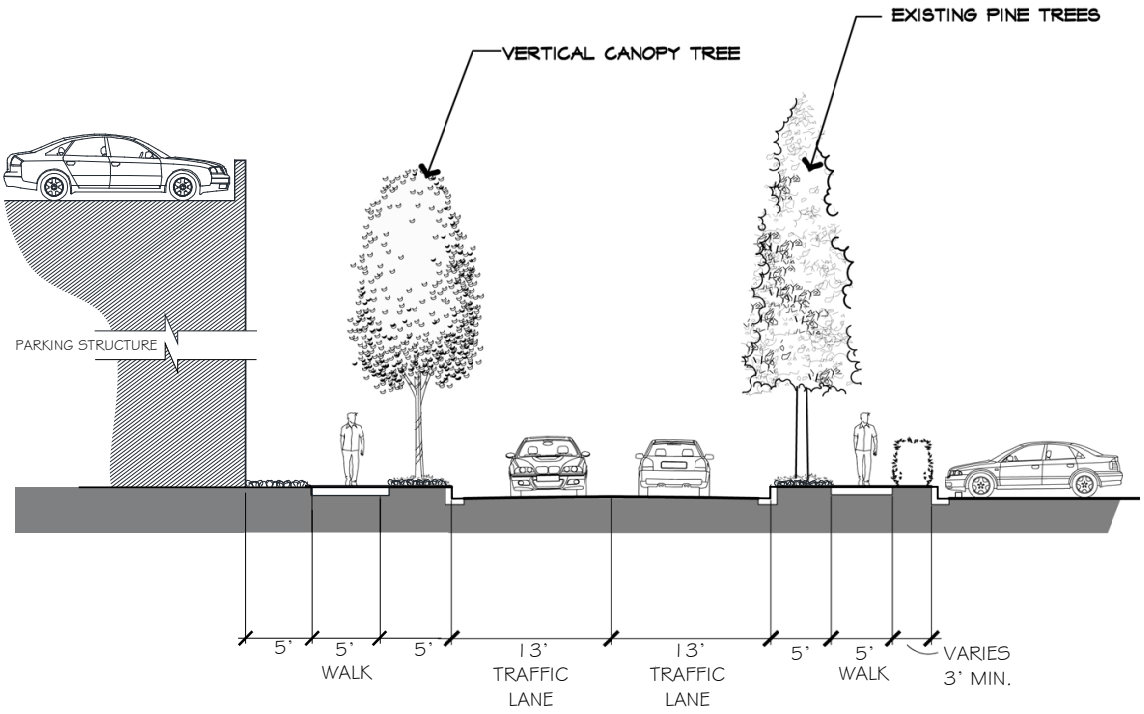


17. Ontario Center Parkway (East of Via Piemonte) Section

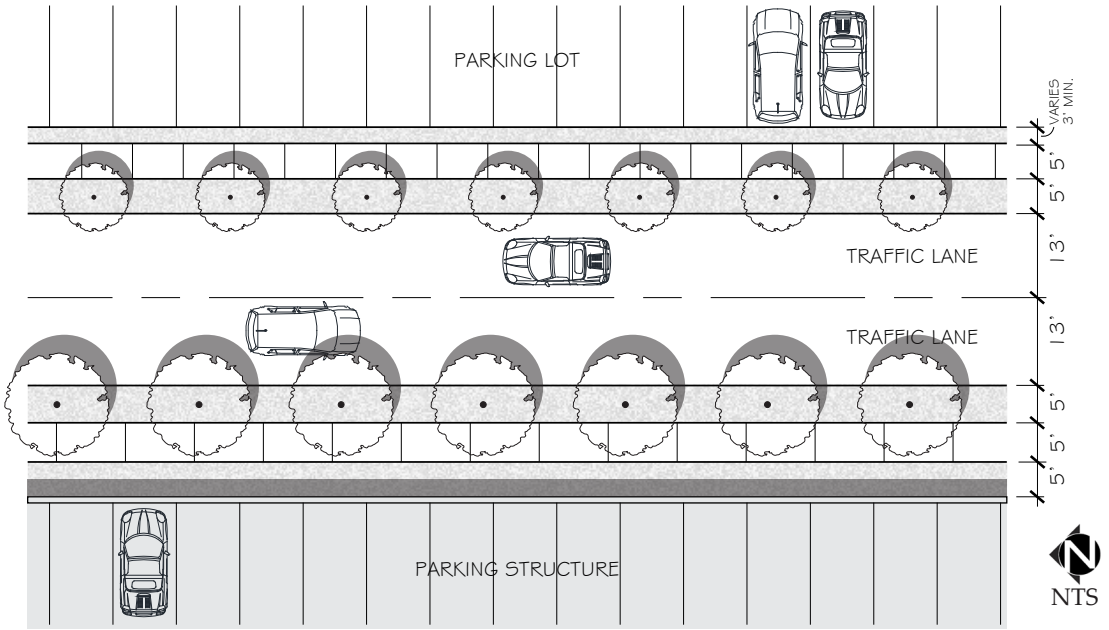


17. Ontario Center Parkway (East of Via Piemonte) Plan

Figure 3.8k: Ontario Center Parkway Roundabout Public Streetscape Section and Plan

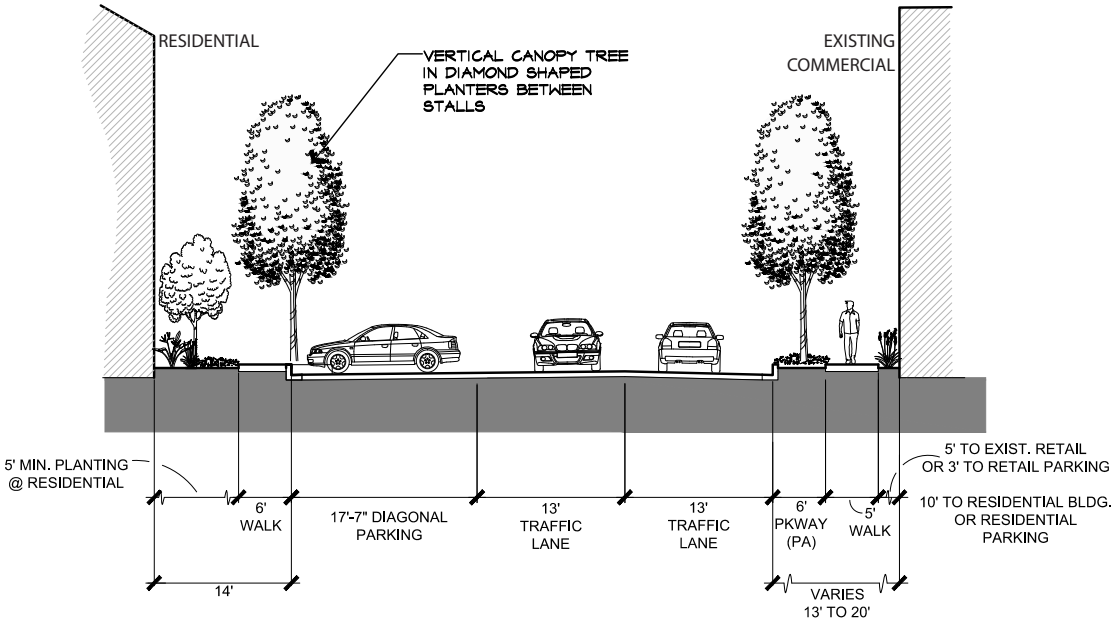


18. Via Alba - North Section (North of Via Villagio)

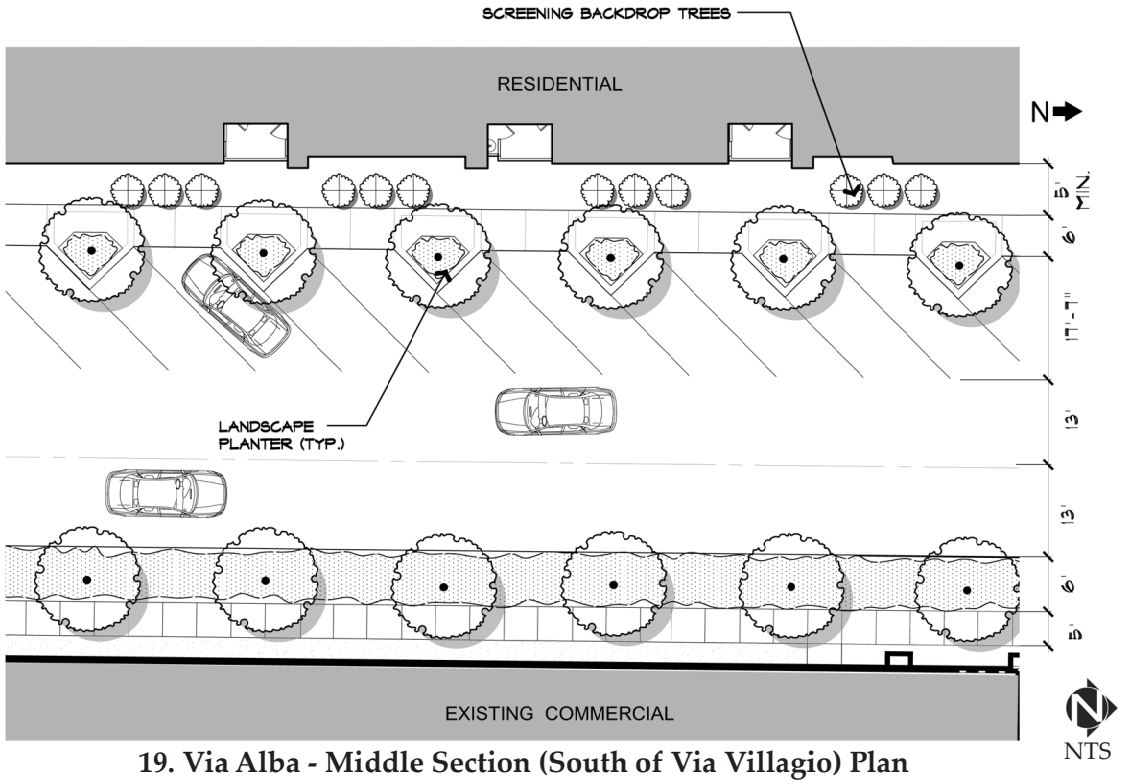


18. Via Alba - North Section (North of Via Villagio)

Figure 3.8l: Via Alba - North Section (North of Via Villagio) Private Streetscape Section and Plan

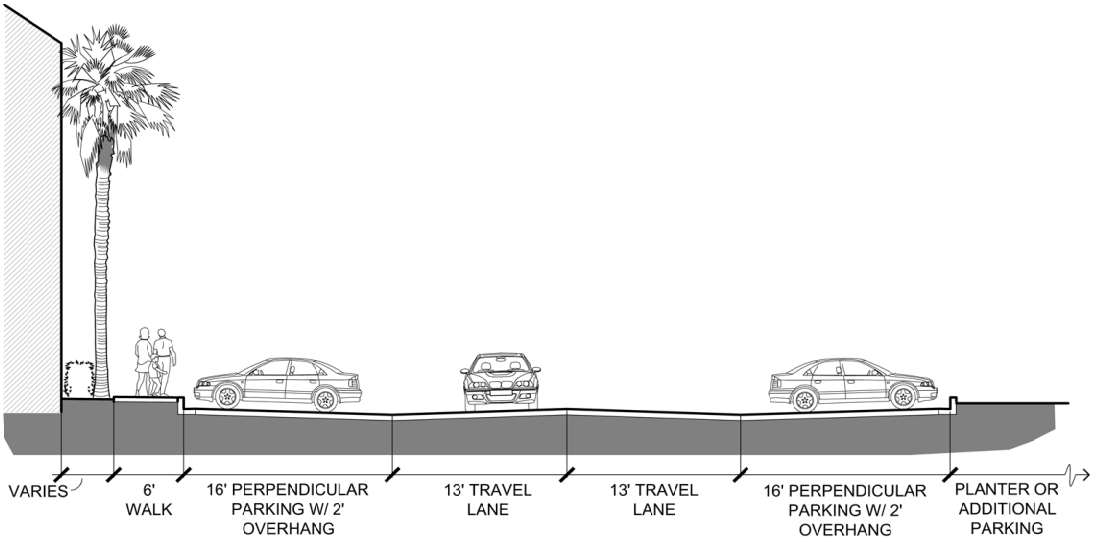


19. Via Alba - Middle Section (South of Via Villagio) Section

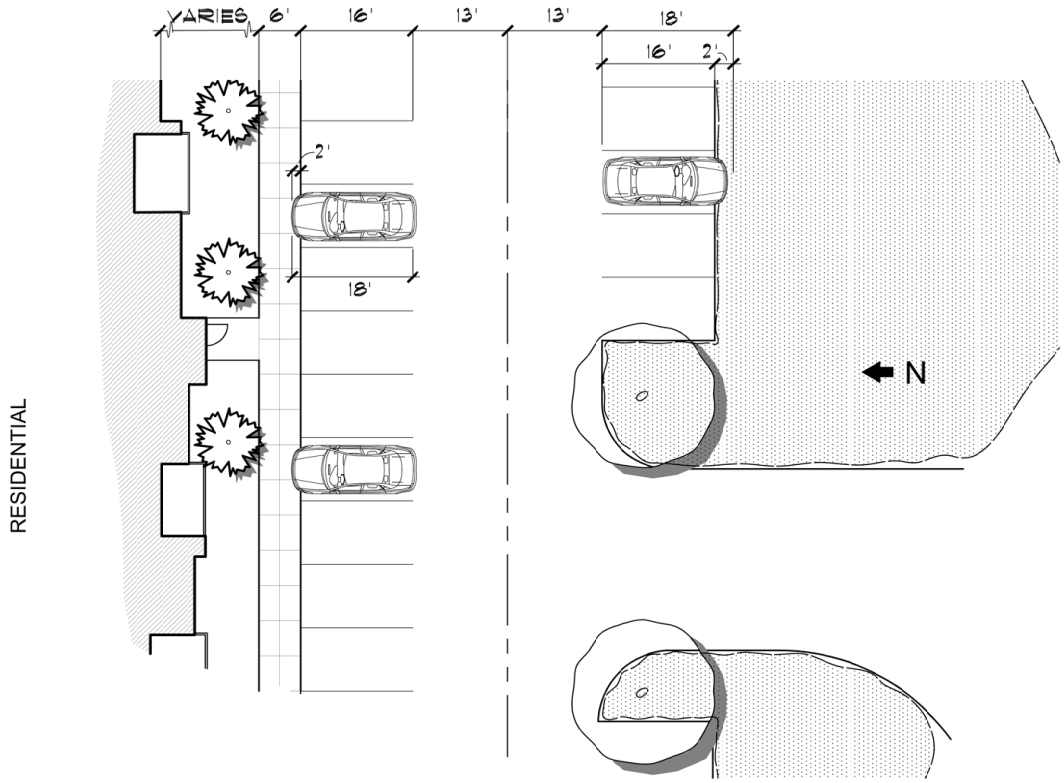


19. Via Alba - Middle Section (South of Via Villagio) Plan

Figure 3.8m: Via Alba - Middle Section (South of Via Villagio) Private Streetscape Section and Plan



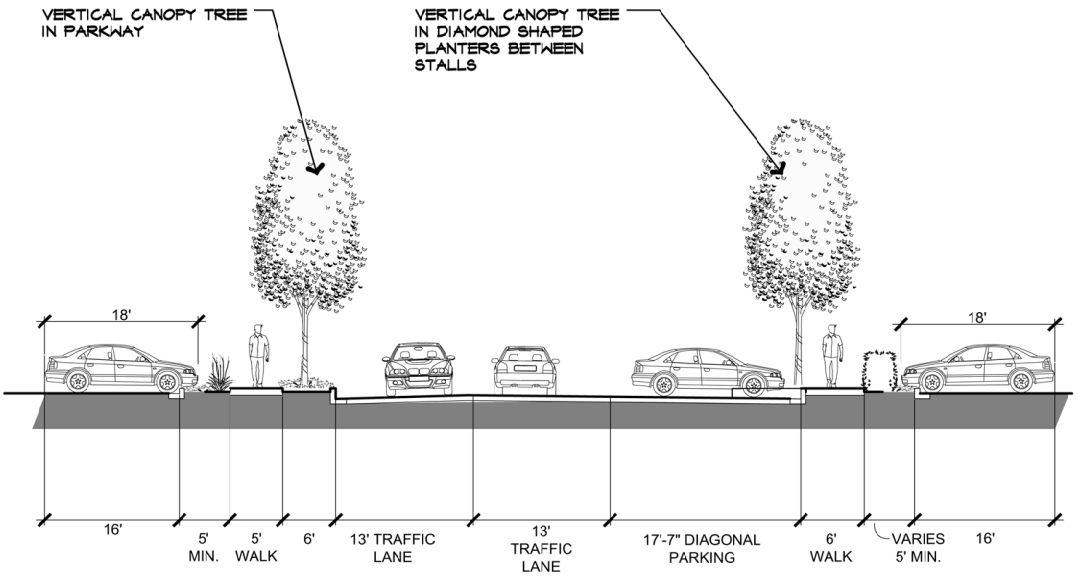
20. Shared Drive Between SA 7, 8, & 11 (South of Via Villagio) Section



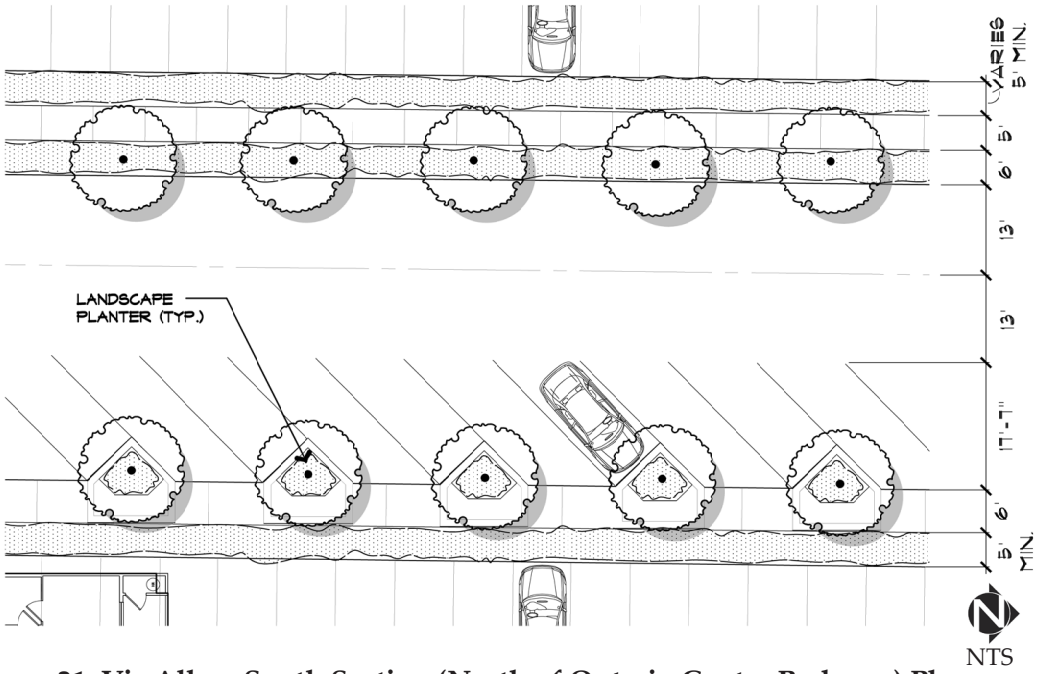
20. Shared Drive Between SA 7,8, &11 (South of Via Villagio) Plan

NTS

Figure 3.8n: Shared Drive Between SA 7, 8, & 11 (South of Via Villagio)
Private Streetscape Section and Plan

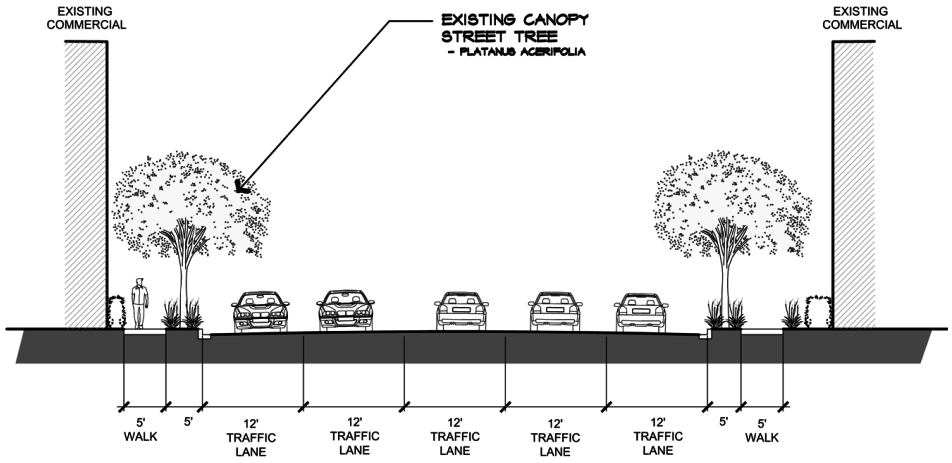


21. Via Alba - South Section (North of Ontario Center Parkway) Section

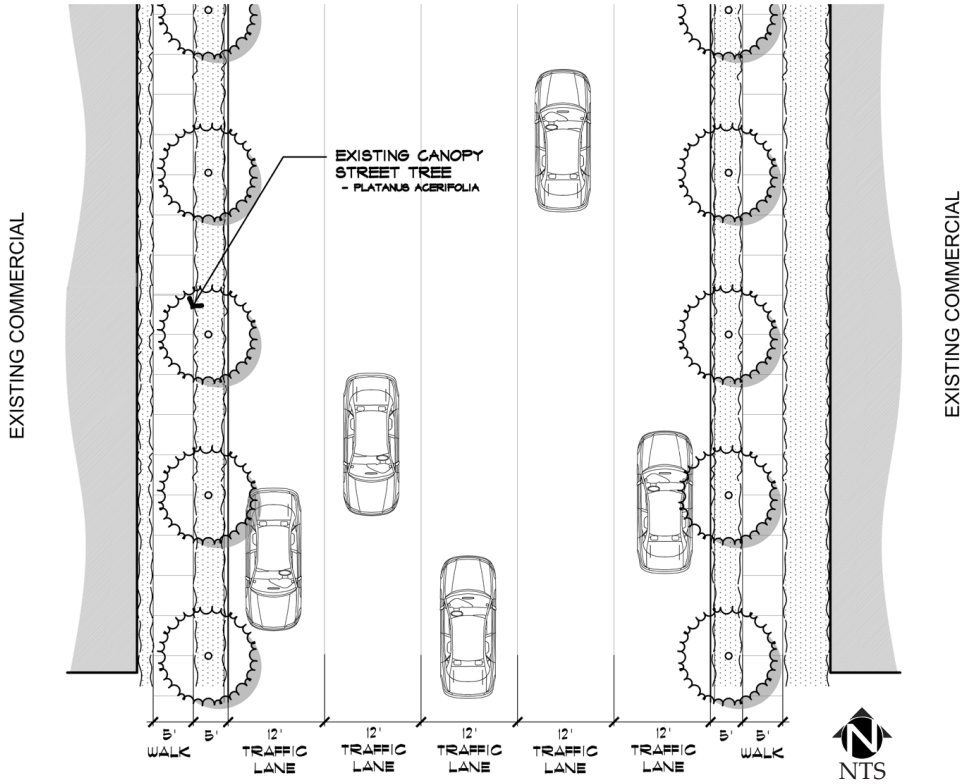


21. Via Alba - South Section (North of Ontario Center Parkway) Plan

Figure 3.8o: Via Alba - South Section (North of Ontario Center Parkway) Private Streetscape Section and Plan

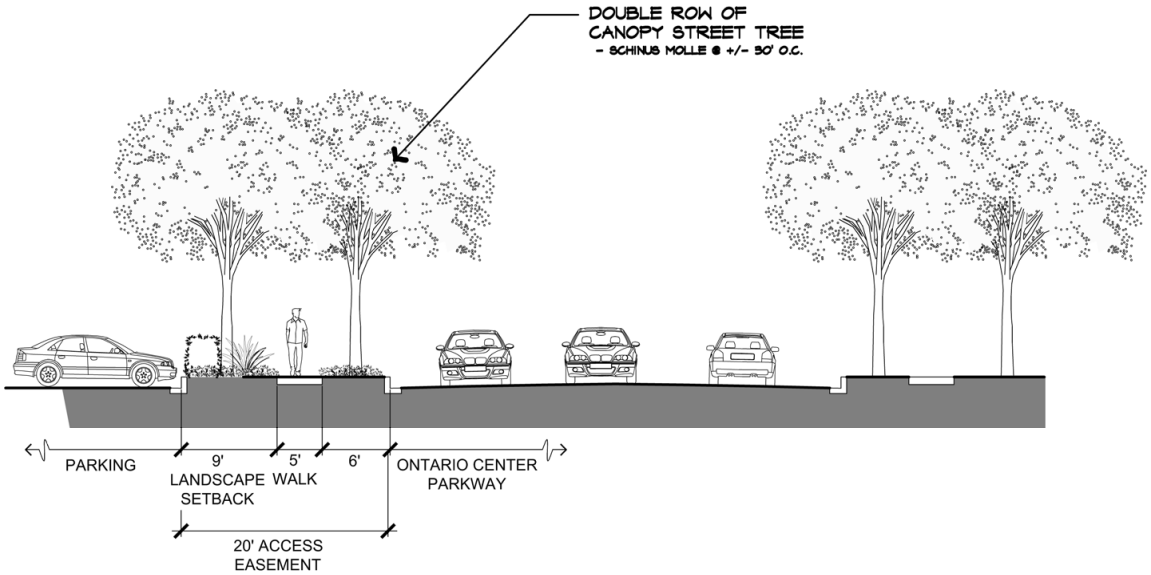


22. Via Turin Section

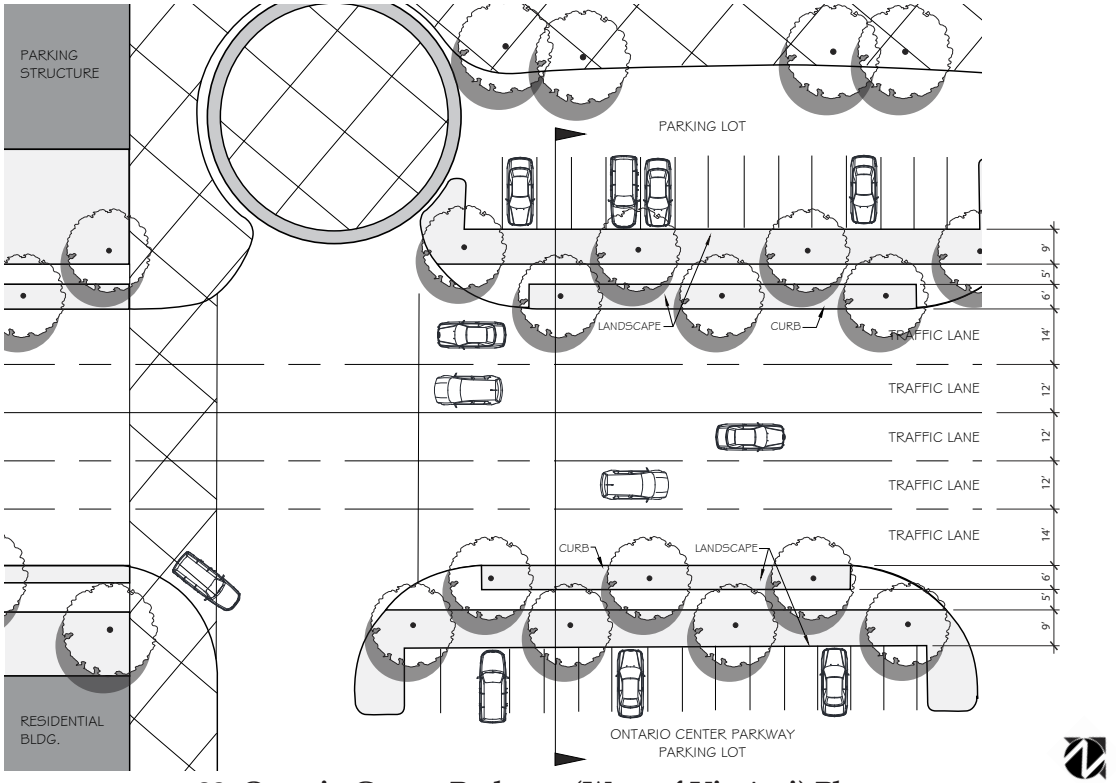


22. Via Turin Plan

Figure 3.8p: Via Turin Private Streetscape Section and Plan



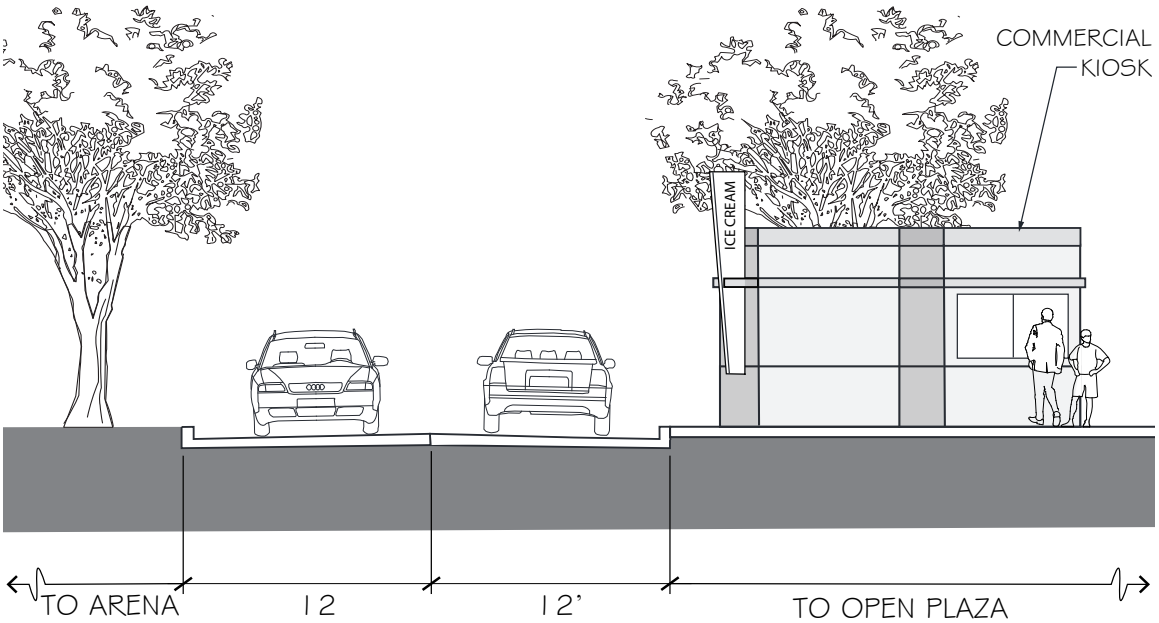
23. Ontario Center Parkway (West of Via Asti) Section



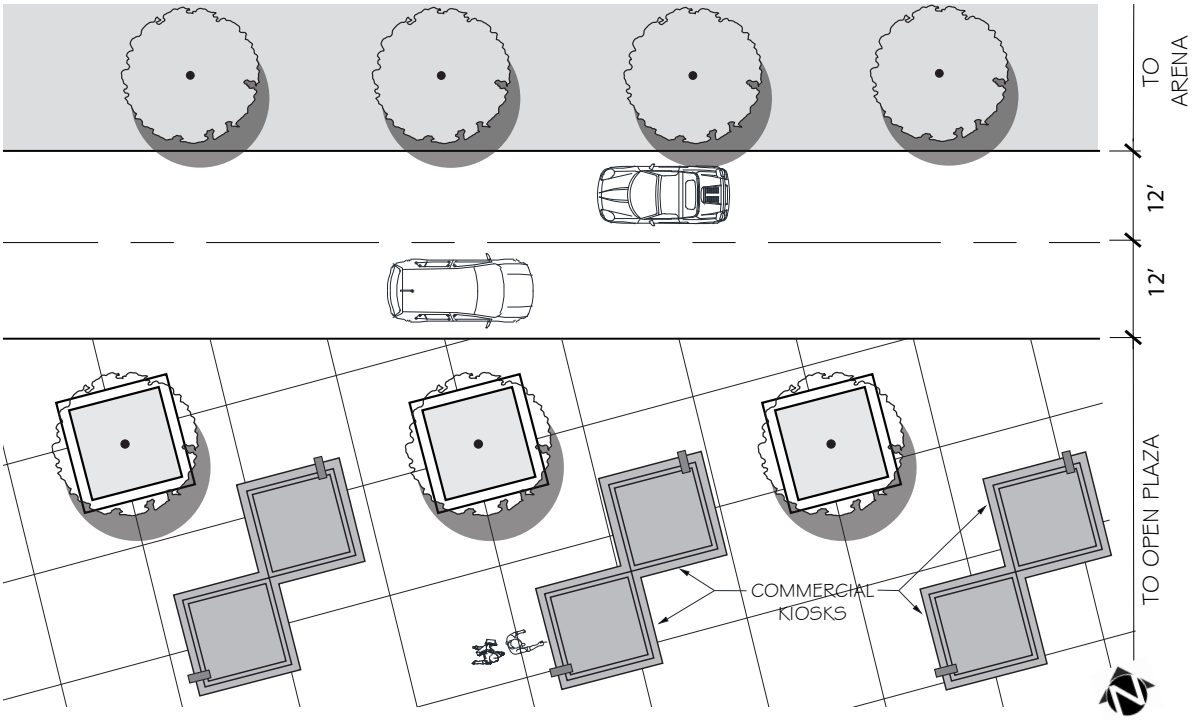
23. Ontario Center Parkway (West of Via Asti) Plan

NTS

Figure 3.8q: Ontario Center Parkway (West of Via Asti) Public Streetscape Section and Plan

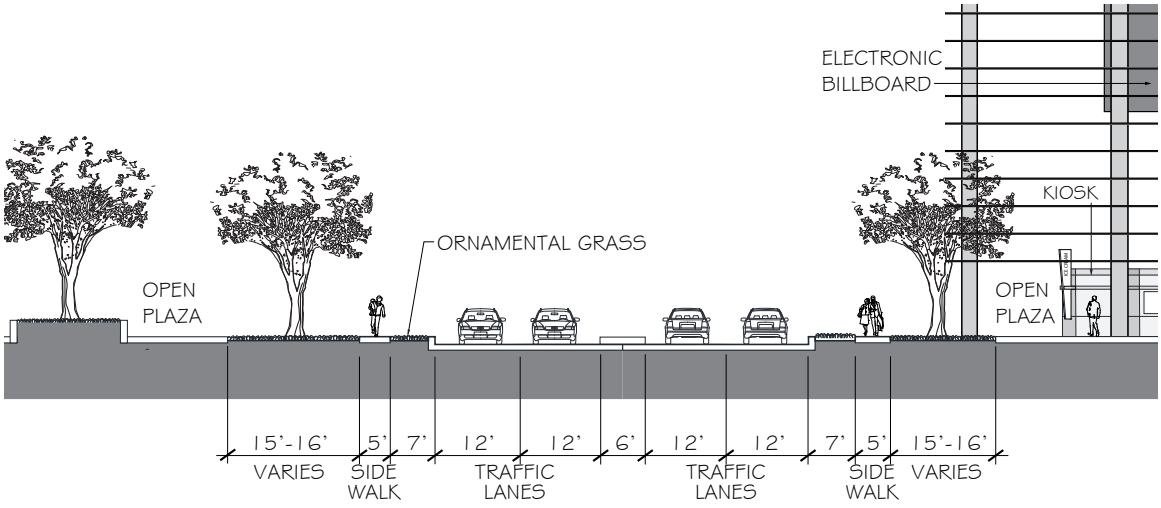


24. Shared Drive Between SA 18 & 19 (South of Toyota Arena) Section

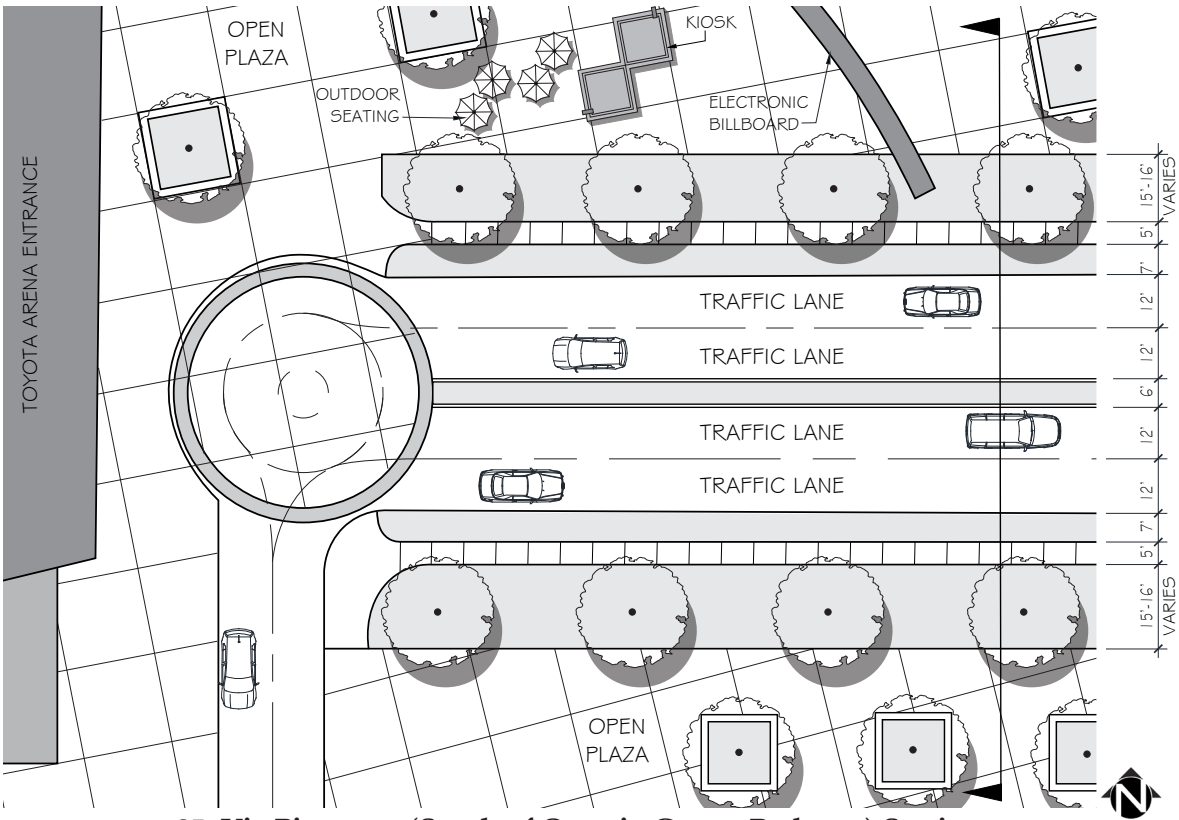


24. Shared Drive Between SA 18 & 19 (South of Toyota Arena) Plan

Figure 3.8r: Shared Drive Between SA 18 & 19 (South of Toyota Arena) Private Streetscape Section and Plan

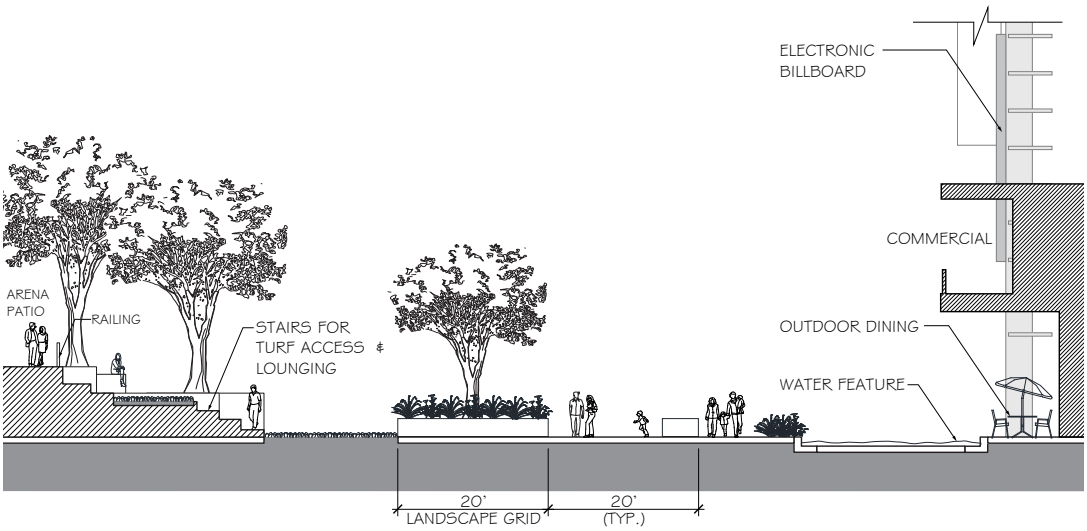


25. Via Piemonte (South of Ontario Center Parkway) Section

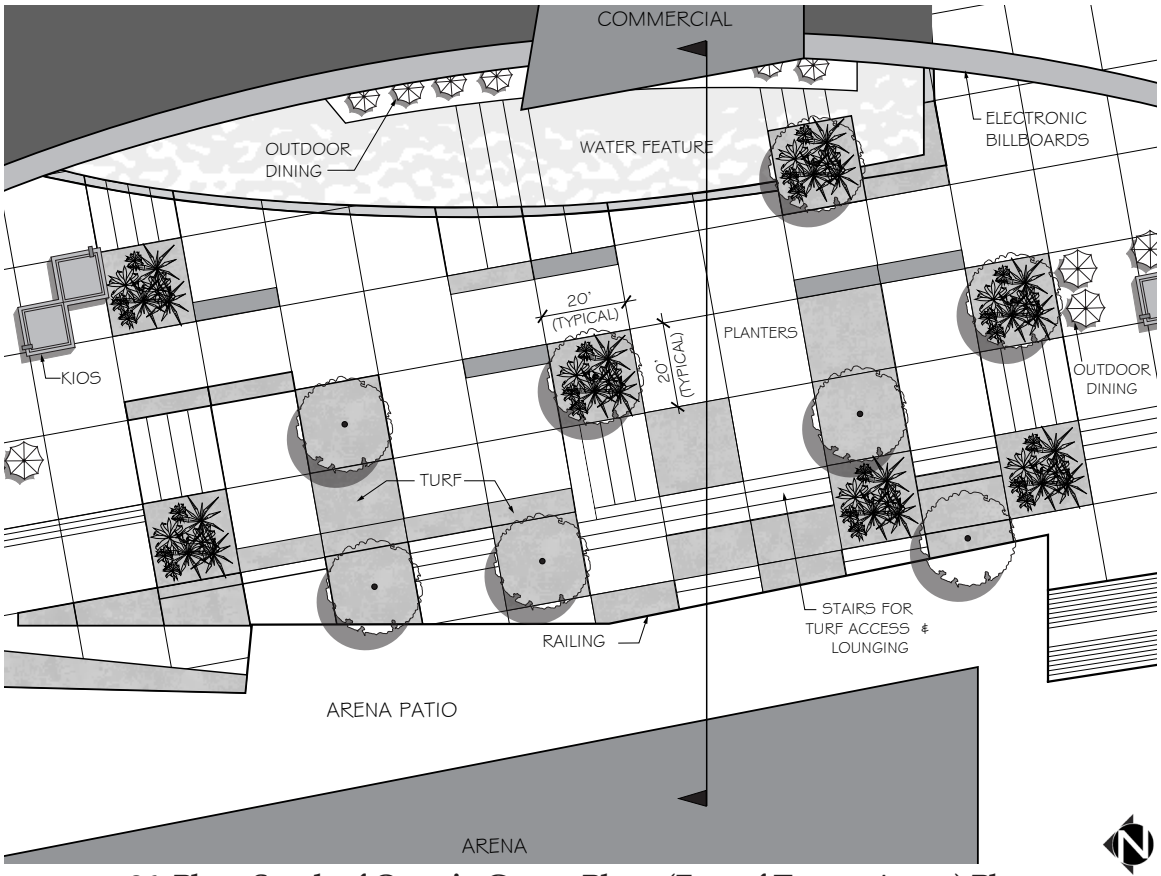


25. Via Piemonte (South of Ontario Center Parkway) Section NTS

Figure 3.8s: Shared Drive Between SA 17 & 18 (South of Toyota Arena) Private Streetscape Section and Plan

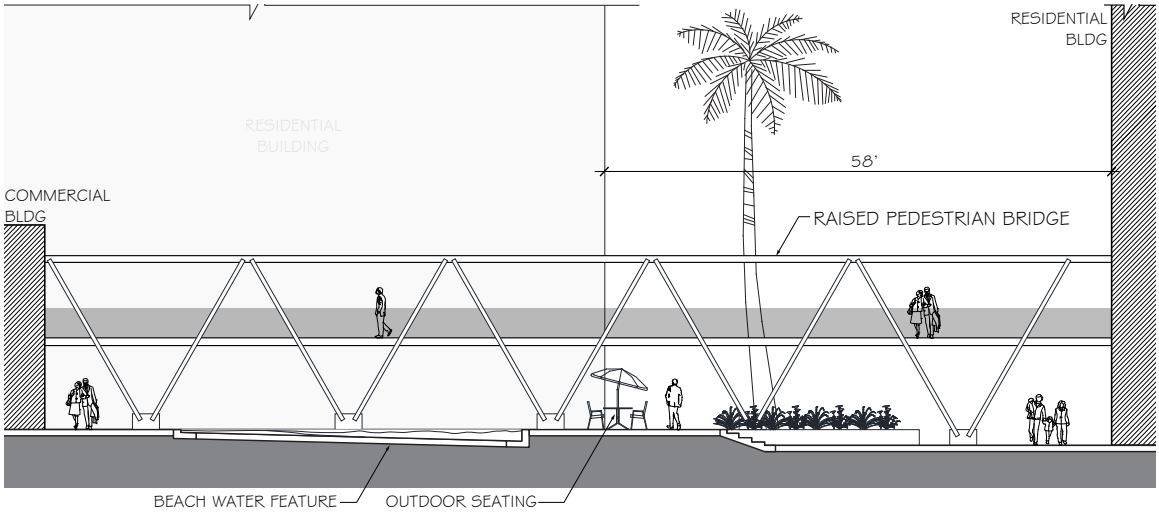


26. Plaza South of Ontario Canter Pkwy (East of Toyota Arena) Section

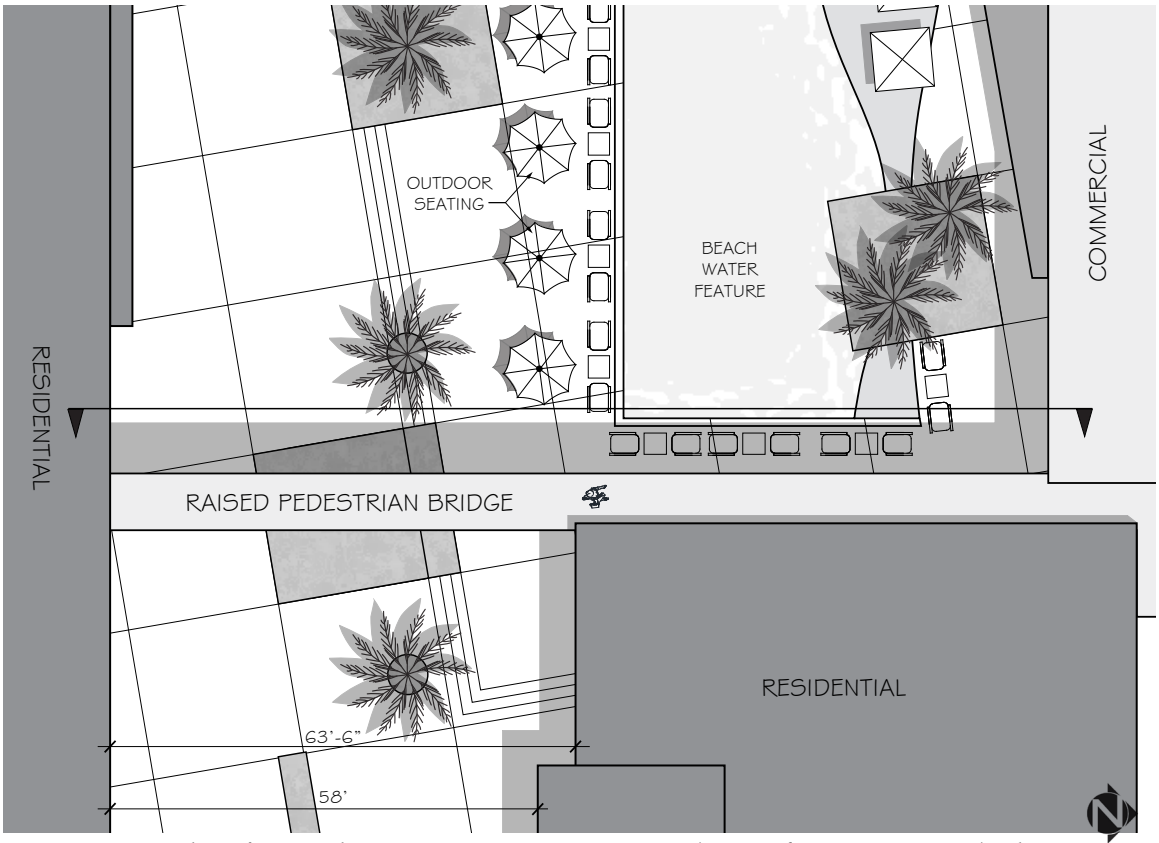


26. Plaza South of Ontario Canter Pkwy (East of Toyota Arena) Plan

Figure 3.8t: Plaza East of Toyota Arena Private Streetscape Section and Plan



27. Pedestrian Pathway Between SA 16 & 17 (East of Toyota Arena) Section



27. Pedestrian Pathway Between SA 16 & 17 (East of Toyota Arena) Plan NTS

Figure 3.8u: Pedestrian Pathway Between SA 16 & 17 (East of Toyota Arena) Private Streetscape Section and Plan

concepts to be implemented at each type of entry. Sufficient area on both sides of entry roadways should be reserved to allow for construction of entry statement features and associated landscaping. To these ends, 400 square feet in a roughly square configuration shall be reserved at each Primary entry intersection corner (800 square feet total, 400 square feet allocated to each intersection corner); 300 square feet in a roughly square configuration shall be reserved at Secondary entry intersection corner (600 square feet total, 300 square feet allocated to each intersection corner); and 200 square feet in a roughly square configuration shall be reserved at each Tertiary entry intersection corner (400 square feet total, 200 square feet allocated to each intersection corner). The entry designs will be submitted at the time of the development application.

OCSP Entry Treatments

Figure 3.9: Piemonte Overlay Entry Hierarchy also identifies the location of primary and secondary entries to the OCSP, which entries are shared intersections with the Piemonte Overlay at Ontario Center. At these locations, the Piemonte Overlay will integrate and complete entry statements and intersection treatments consistent with current requirements of the OCSP. Schematic designs and dimensional criteria for these OCSP entry treatments are presented in Figure 3.13: Existing OCSP Entry Statement. Please refer also to related discussions presented in Section 3.8.4 Signs.

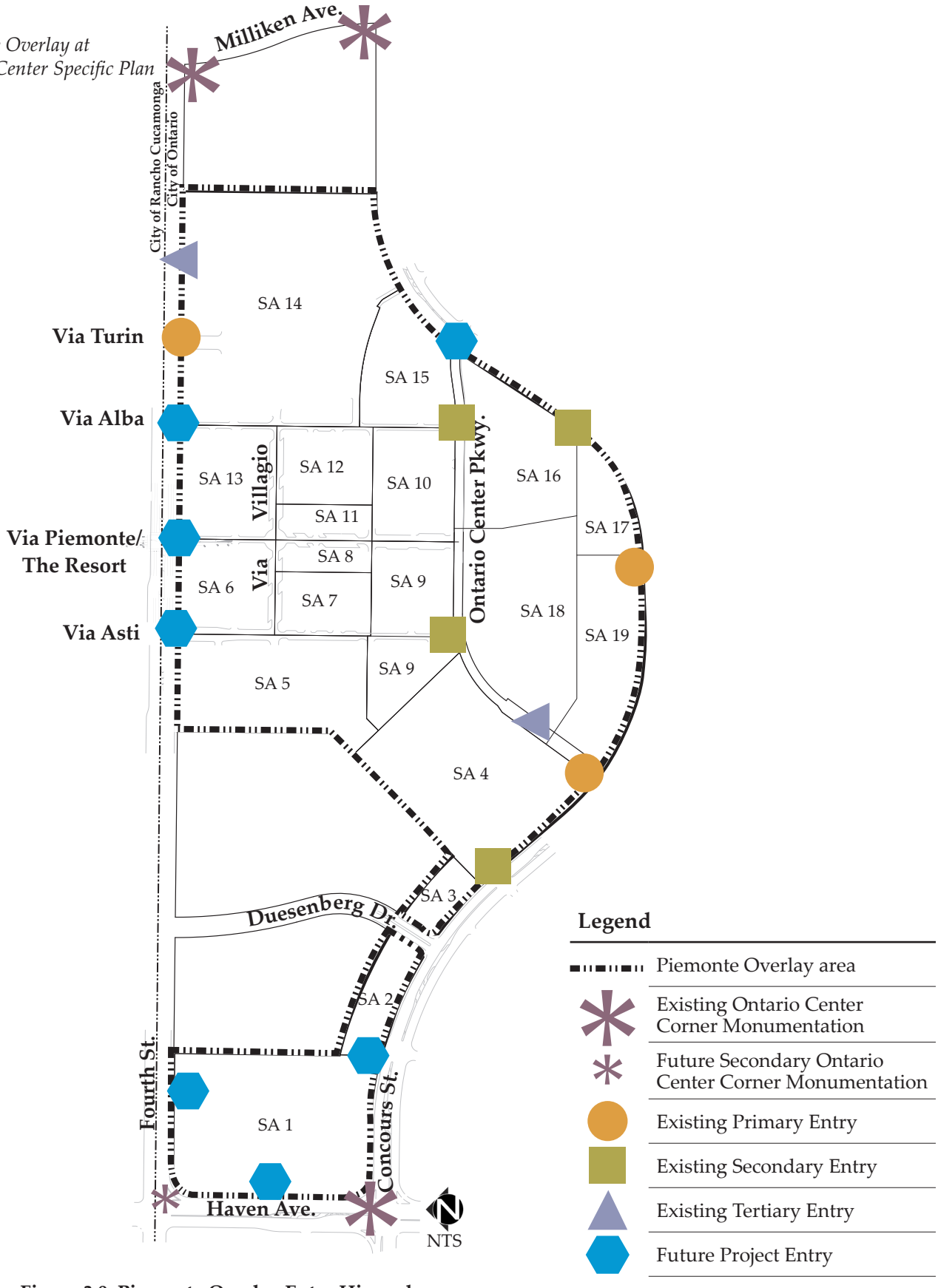
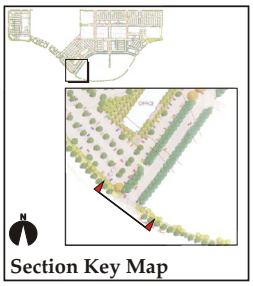


Figure 3.9: Piemonte Overlay Entry Hierarchy



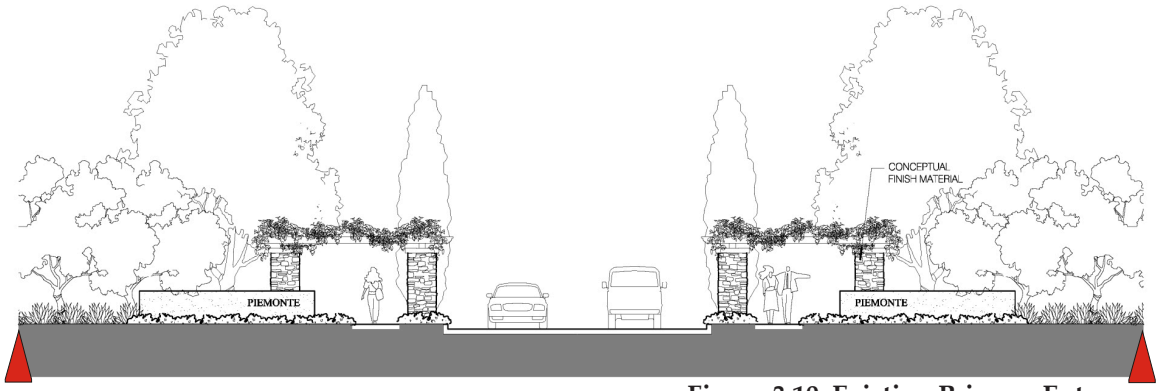
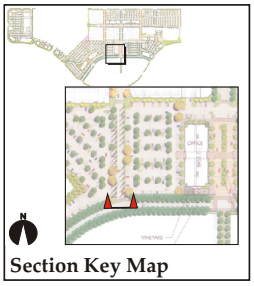


Figure 3.10: Existing Primary Entrance



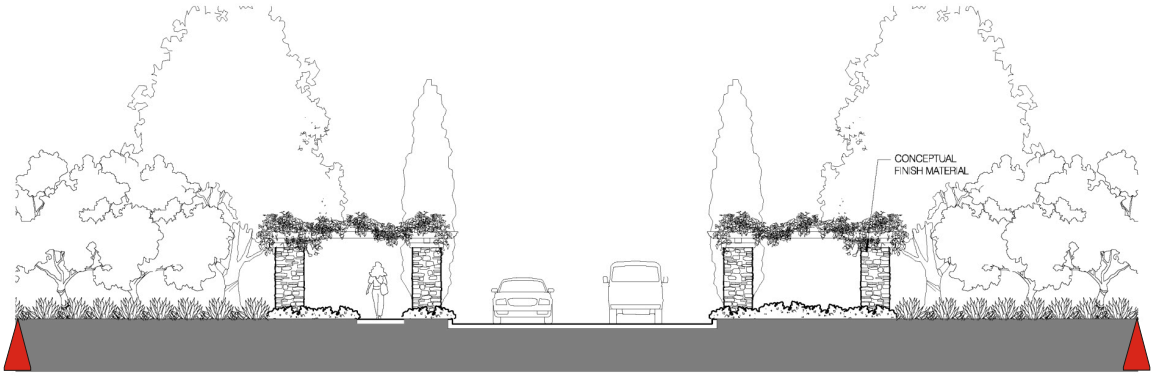
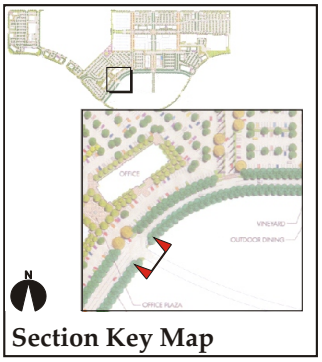


Figure 3.11: Existing Secondary Entrance



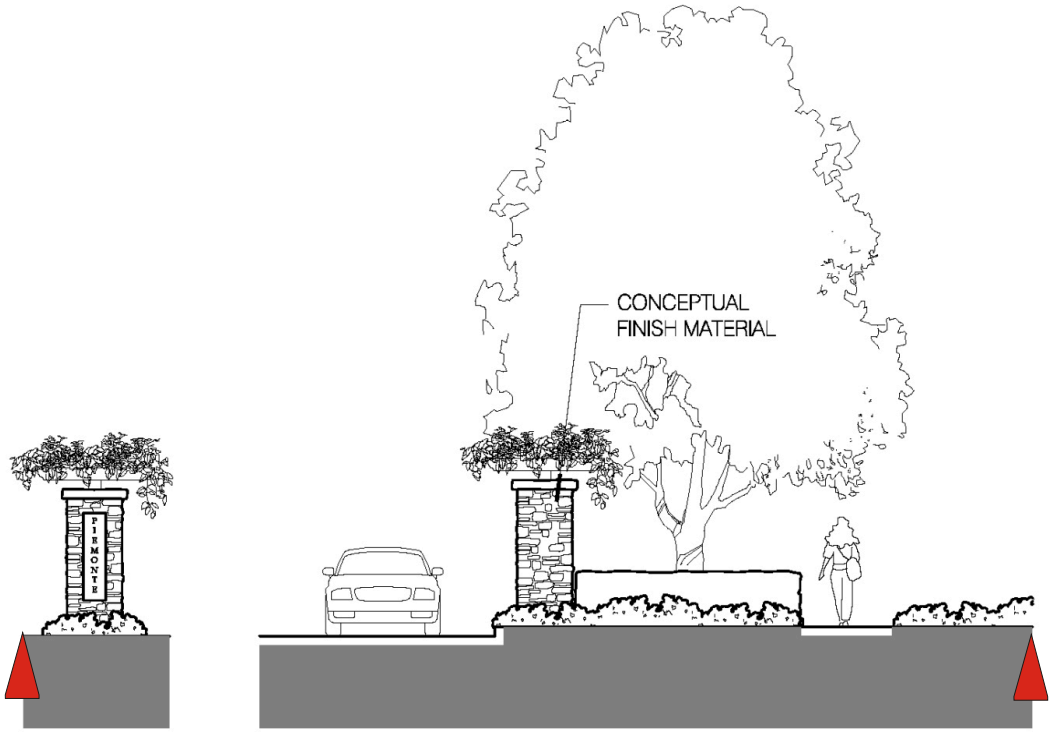


Figure 3.12: Existing Tertiary Entrance

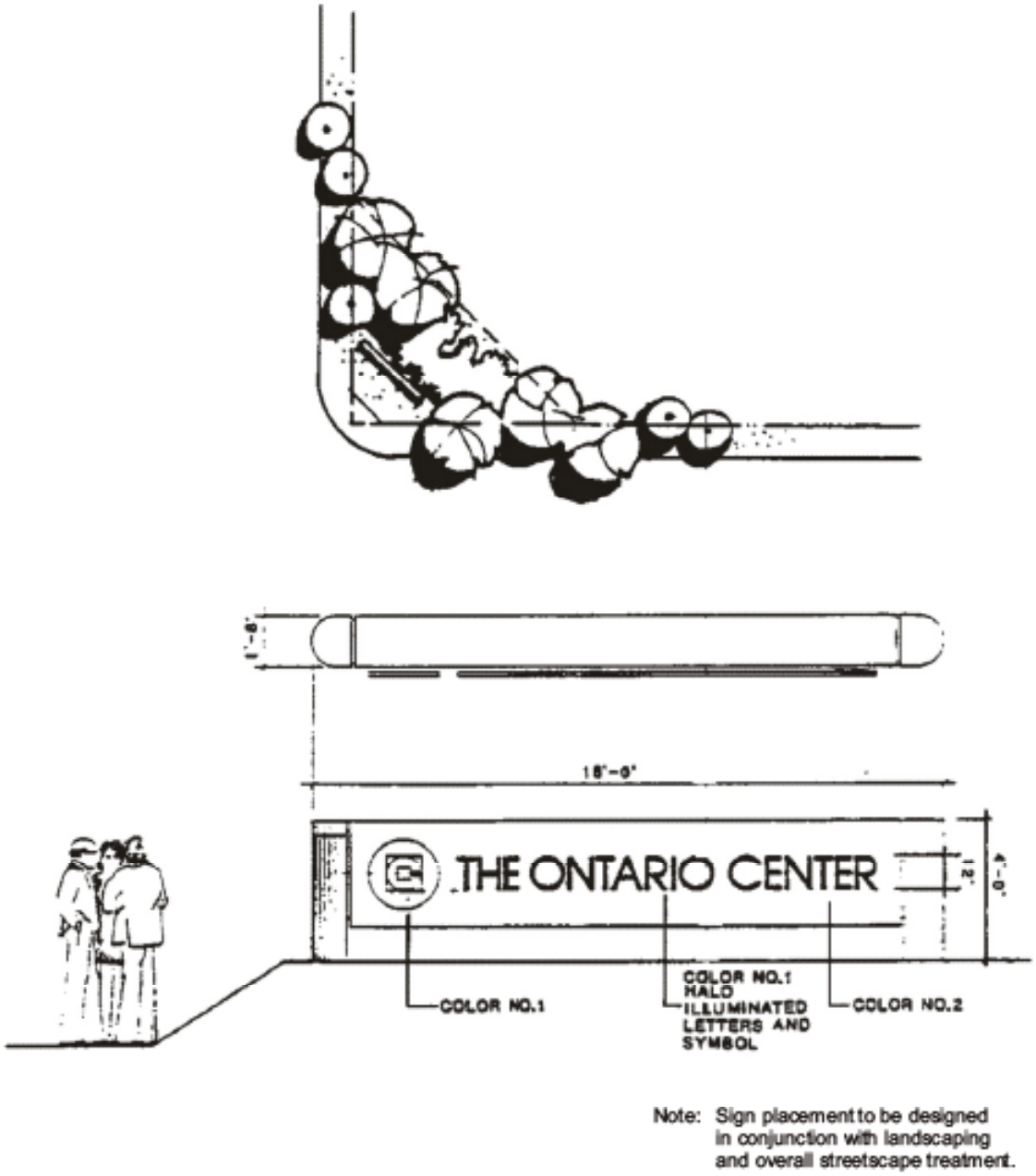


Figure 3.13: Existing OCSP Entry Statement

3.8.2 Landscape/Streetscape Development Regulations

3.8.2.1 General Landscape and Planting Requirements

General landscape/streetscape development regulations presented below are representative of area-wide requirements of the OCSP and shall guide the selection and installation of landscape improvements within the Overlay:

- Shrubs shall be 5 gallon minimum.
- All street trees shall be planted and staked per City of Ontario Standards. All trees receive separate tree bubbler irrigation.
- Trees shall be planted in minimum sizes and ratios presented in Table 3.7: Piemonte Overlay Tree Planting Schedule.

Table 3.7: Piemonte Overlay Tree Planting Schedule

Minimum Tree Size Mix	
Minimum Percent Mix of Required Trees	**Size**
10%	48-inch box or larger
15%	36-inch box
25%	24-inch box
50%	15-gallon
Minimum Tree Species Mix	
Number of Trees Proposed	**Number of Tree Species Required**
20 or fewer	2
21 to 30	3
31 to 40	4
More than 40	5

Tree planting ratios for major streets shall be:

- Primary tree species: 40 percent
- Secondary tree species: 60 percent
- Trees in parkways and medians shall be at an average ratio of 4 trees per 100 linear feet of frontage unless otherwise specified.

Planting for major street medians and parkway shall be, ground cover, ornamental grasses and shrubs. In addition to the above requirements, 15 percent of the median area shall be devoted to cobble treatment. Exceptions to the above requirements may be granted by the City.

Staking and guying of all trees shall be in accord with City standards. Where appropriate, vines or suitable shrubs shall be used throughout the Piemonte Overlay for graffiti deterrence. Replacement of dead or broken plant material shall be the responsibility of the property owner. All landscaped areas within the Overlay shall be maintained to City standards. All landscape and irrigation plans shall be submitted to, and approved by, the City. Changes in the landscape, irrigation plans, or plant materials may be substituted as necessary by the City.

3.8.2.2 Public Streetscape

Each public street along the perimeter of the Overlay has a set of designated primary trees, complemented by a range of subordinate (or secondary) tree plantings. The previous Figures 3-9 and Figure 3.8n: Via Turin Private Streetscape Section and Plan and Figures 3-11 and Figure 3.8l: Via Alba - Middle Section (South of Via Villagio) Private Streetscape Section and Plan schematically present how the streetscape was implemented along these streets. Significant elements identified within these Figures include a meandering sidewalk, bordered on both sides by shrubs, groundcover, ornamental grass, and primary and secondary trees. Ornamental grass and trees will be located between the sidewalk and street pavement. Trees, shrubbery and groundcover will be located behind the sidewalk. Refer to Appendix E for the Applicable OCSP Planting Matrix for these streets.

3.8.2.3 Private Streetscape

Each private drive within the Piemonte Overlay also has designated primary and secondary tree plantings refer to Table 3.8: Private Street Planting Matrix and Table 3.9: Internal Trees for the species allowed for each drive.

Table 3.8: Private Street Planting Matrix

Species		Primary Entrance Statement	Secondary Entrance Statement	Via Asti	Via Piemonte	Via Alba	Via Villagio
Latin name	Common name						
Citrus species	NCN			X		X	
Cupressus sempervirens	Italian Cypress	X	X			X	
Olea europaea	Fruitless Olive			X	X		X
Quercus suber	Cork Oak			X	X		
Phoenix canariensis	Canary Island Date Palm				X		X
Phoenix dactylifera	Date Palm				X		
Pinus canariensis	Canary Island Pine					X	
Pittosporum undulatum	Victorian Box			X		X	
Platanus acerifolia	London Plane			X			X
Washingtonia filiferia	California Fan Palm	X	X	X		X	X

Table 3.9: Internal Trees

Latin name	Common name
Trees	
Arbutus 'Marina'	Strawberry Tree
Bambusa oldhamii	Clumping Giant Timber Bamboo
Bauhinia purpurea	Orchid Tree
Cercidium hybrid 'Desert Museum'	Hybrid Palo Verde
Citrus sinensis	Orange Tree
Eucalyptus citriodora	Lemon Scented Gum
Jacaranda mimosifolia	Jacaranda
Koelreuteria paniculata	Golden Rain Tree
Lagerstroemia indica	Crape Myrtle
Magnolia grandiflora 'D.D. Blanchard'	Southern Magnolia
Magnolia grandiflora 'Little Gem'	Southern Magnolia
Michelia champaca 'Alba'	White Fragrant Himalayan Champaca
Olea europaea	Olive
Pinus caneriensis	Canary Island Pine
Pyrus calleryana 'Chanticleer'	Chanticleer Pear
Rhus lancea	African Sumac
Strelitzia nicholai	Giant Bird-of-Paradise
Tristania conferta	Brisbane Box
Palms	
Archontophoenix cunninghamiana	King Palm
Brahea armata var. Clara	Droopy Mexican Blue Fan Palm
Chamaerops humilis	Mediterranean Fan Palm
Cycas revoluta	Sago Palm
Syagrus romanzoffianum	Queen Palm

3.8.2.4 Plant Palette/Planting Matrix

Table 3.10: Shrub Plant Palette for Parkways and Streetscapes and Table 3.11: Shrub Plant Palette for Internal Courtyards and Landscape Areas Not Adjacent to Streetscapes lists environmentally sustainable plant materials are also allowed within the Overlay to reinforce the architectural and land use planning themes. Plant varieties as indicated above will be employed in varying combinations throughout the Overlay.

Table 3.10: Shrub Plant Palette for Parkways and Streetscapes

Latin name	Common name
Acacia cognata 'Cousin Itt'	Little River Wattle
Agapanthus africanus	Lily-of-the-Nile
Agave 'Blue Flame'	Blue Flame Agave
Aloe arborescens	Tree Aloe
Aloe bainesii (barberae)	N.C.N.
Aloe vera	Medicinal Aloe
Buxus microphylla japonica	Japanese Boxwood
Callistemon viminalis 'LittleJohn'	Dwarf Bottlebrush
Carex species	Blue Sedge
Carissa grandiflora 'Green Carpet'	Natal Plum
Citrus Kumquat Hybrid 'Tavares'	Kumquat
Cordyline australis 'Red Star'	Red Grass Palm
Dianella tasmanica 'Silver Streak'	Silver Streak Flax Lily
Feijoa sellowiana	Pineapple Guava
Hemerocallis 'Dwarf Red'	Day Lily
Ilex crenata 'Sky Pencil'	Sky Pencil Ilex
Juncus patens	California Gray Rush
Juniperus scopulorum 'Skyrocket'	Skyrocket Juniper
Leucodendron 'Jester'	Sunshine Conebrush
Leucophyllum langmaniae 'Lynn's Legacy'	Lynn's Legacy Texas Ranger
Leymus condensatus 'Canyon Prince'	Canyon Prince Wild Rye
Ligustrum japonicum 'Texanum'	Wax Leaf Privet
Lomandra longifolia 'LM300'	Breeze Dwarf Mat Rush
Moraea bicolor	Fortnight Lily
Olea europaea 'Montra' P.P.#6266	Little Ollie Dwarf Olive
Pelargonium hortorum	Common Geranium
Pennisetum 'Fairy Tails'	Fairy Tails Fountain Grass
Penstemon 'Firebird'	Beard Tongue
Pittosporum Species	Tobira
Podocarpus elongatus 'Monmal'	Icee Blue Yellow-Wood
Rhaphiolepis species	Indian Hawthorne
Rosa f. 'Trumpeter'	Trumpeter Rose
Rosa x 'Noare'	Flower Carpet Red Groundcover Rose
Strelizia reginae	Bird-of-Paradise
Tecoma stans 'Sierra Apricot'	Sierra Apricot

Table 3.11: Shrub Plant Palette for Internal Courtyards and Landscape Areas Not Adjacent to Streetscapes

Latin name	Common name
Acacia cognata 'Cousin Itt'	Little River Wattle
Agapanthus africanus	Lily-of-the-Nile
Aloe arborescens	Tree Aloe
Aloe bainesii (barberae)	N.C.N.
Aloe vera	Medicinal Aloe
Buxus microphylla japonica	Japanese Boxwood
Callistemon viminalis 'LittleJohn'	Dwarf Bottlebrush
Carex species	Blue Sedge
Carissa grandiflora 'Green Carpet'	Natal Plum
Citrus Kumquat Hybrid 'Tavares'	Kumquat
Cordyline australis 'Red Star'	Red Grass Palm
Dianella tasmanica 'Silver Streak'	Silver Streak Flax Lily
Feijoa sellowiana	Pineapple Guava
Hemerocallis 'Dwarf Red'	Day Lily
Ilex crenata 'Sky Pencil'	Sky Pencil Ilex
Juncus patens	California Gray Rush
Juniperus scopulorum 'Skyrocket'	Skyrocket Juniper
Leucodendron 'Jester'	Sunshine Conebrush
Leucophyllum langmaniae 'Lynn's Legacy'	Lynn's Legacy Texas Ranger
Leymus condensatus 'Canyon Prince'	Canyon Prince Wild Rye
Ligustrum japonicum 'Texanum'	Wax Leaf Privet
Lomandra longifolia 'LM300'	Breeze Dwarf Mat Rush
Moraea bicolor	Fortnight Lily
Olea europaea 'Montra' P.P.#6266	Little Ollie Dwarf Olive
Pelargonium hortorum	Common Geranium
Pennisetum 'Fairy Tails'	Fairy Tails Fountain Grass
Penstemon 'Firebird'	Beard Tongue
Pittosporum Species	Tobira
Podocarpus elongatus 'Monmal'	Icee Blue Yellow-Wood
Rhaphiolepis species	Indian Hawthorne
Rosa f. 'Trumpeter'	Trumpeter Rose
Rosa x 'Noare'	Flower Carpet Red Groundcover Rose
Strelizia reginae	Bird-of-Paradise
Tecoma stans 'Sierra Apricot'	Sierra Apricot

3.8.2.5 Other Elements

Design and development standards applicable to other features represented within the Overlay area are discussed below.

Parking Lot/Streetscape Interface

As provided for under the OCSP to implement the informal landscape concept proposed along the major arterials within the Piemonte Overlay parking setbacks within the Overlay may be averaged.

Limited Use Areas

Standard limited use areas shall be maintained within the Piemonte Overlay as required by the City Engineering Department. Limited use areas restrict development and obstructions proximate to intersections, thereby establishing adequate site distances and promoting pedestrian and vehicular safety.

Retaining Walls

It is anticipated that certain areas of the Piemonte will require construction of expansive retaining walls which will be exposed to public view. Screenwalls may also be introduced where protection from intrusive views may be warranted. The following standards will be observed for expansive walls constructed within the Overlay:

- Visual impact of walls should be minimized by limiting wall heights to five (5) feet whenever possible.
- Walls will be stepped to allow for screen planting whenever possible.

Landscape Grading

Landscaped areas within the Overlay area will be graded as swales to the maximum extent practicable in order to maximize conservation of irrigation water and natural rainfall run-off.

3.8.3 Piemonte Open Space and Urban Recreational Opportunities

The Piemonte Overlay has a unique opportunity to provide an amazing active open space amenity, due to the connection and adjacency to the Arena. Several of the private streets have been designed so they can easily be closed off to vehicular traffic, thereby creating a pedestrian open air mall.

Special events and festivals, along with farmer's markets, would benefit from this flexible urban activity. Most useful, however, would be pre- and post-game celebrations extending up from the Arena. Physically expanding the connection to the restaurants and retail component, which will be directly located east and south of the Arena and just one block to the north, will not only create an economic benefit, but more importantly foster a social connection among event attendess and other visitors; as well as create a hub of activity.

3.8.4 Signs

The following discussions identify visual attributes of, and define the standards for, signs within the Piemonte Overlay. The intent is to permit flexibility of design consistent with the proposed mix of land uses, and to provide a cohesive system of signs that are visually coordinated and aesthetically pleasing.

Various signs and monumentation within the Piemonte Overlay will provide identity and reinforce the land use plan and architectural design of the proposal. Sign design and details will relate to the architectural character, support the overall design concept, and reflect the proposed varied architectural styles.

The Sign Design Guidelines and Sign Regulations presented below constitute the basis of the Master Sign Program for the Piemonte Overlay, which Program is subject to review and approval by the City as provided in Chapter 4. The Master Sign Program will illustrate and demonstrate thematic integration of signs within the overall design, as well as internal compatibility of signs with each other, and with other elements. Further, as verified by the City through the review

processes, all signage will comply with applicable provisions of the Manual on Uniform Traffic Control Devices (MUCTD).

The Master Sign Program will be developed concurrent with design of each individual Project. As a minimum, a draft of the Master Sign Program will be provided to the City for review prior to issuance of the first building permit within the applicable project site, with final approval of the Master Sign Program to be accomplished prior to issuance of the first Certificate of Occupancy. Signs proposed for individual development projects within the Piemonte Overlay will be reviewed by the Planning Department/City for consistency with the Piemonte Sign Program.

3.8.4.1 Sign Design Guidelines

The following Sign Design Guidelines will establish and reinforce the identity of the Overlay, and provide a cohesive informational and directional graphic system. The detailing and style of signs shall relate to the architectural themes proposed, and shall support the Piemonte development concept while contributing to the overall ambience.

Thematic Character

Interesting and colorful signs will serve to attract patrons and facilitate desired circulation within the Piemonte. Signs will also establish and reinforce the development character within the Piemonte Overlay. The goals of the Piemonte sign guidelines are to:

- Foster variety in signs, including variety of size, design, placement, detail, shape and color.
- Encourage the use of design elements which interpret and incorporate thematic architectural elements.

To achieve these goals, the following guidelines will be followed in the design and implementation of signs within the Piemonte Overlay:

- Signs shall exhibit a varied mix of designs, colors, shapes, materials, and

fabrication technologies to reinforce the architectural themes. For example, modern office buildings within the Overlay will introduce signs evidencing modern designs, and which interpret architectural styles materials and styles of the buildings they (the signs) identify. The use of certain common sign colors, design elements, and/or language (e.g., "XYZ Business at Piemonte"), will lend to a cohesive sense of the Piemonte Overlay.

- Monument entry signs shall be integrated into cohesive landscape treatments.

Sign Categories

The following general categories of signs will be implemented in the Piemonte Overlay.

Perimeter Identity Signs

- **Perimeter Monumentation.** Entry and perimeter statements identifying the overall property and corporate identifications as applicable, consisting of vertical or horizontal monument signs which are integrated into landscape features.
- **Perimeter and Tenant Identification Signs.** Signs and identification statements denoting the Piemonte Overlay, as well as illuminated logos and tenant images which are integrated into building facades and roof edges.
- **Perimeter Directional Signs.** Directional signs located on the perimeter of Piemonte Overlay.

Internal Directional/Informational Signs

- **Site Circulation Signs.** Signs which facilitate pedestrian and vehicle circulation and assist drivers to identify areas within the Overlay while reinforcing the overall Overlay. The character of these signs will reflect the varied architectural themes employed within Overlay.
- **Interior Banners.** System of pole-mounted banners for identification purposes. It is anticipated that banners would be employed primarily in the more informal settings of the Commercial areas.

- **Regulatory Signs.** Regulatory signs will be provided consistent with City requirements. To the extent feasible, these signs will continue and interpret the Overlay architectural and landscape/streetscape themes.

Tenant Signs

Tenant signs will reflect individual occupancies, as determined by specific user requirements, including but not limited to: corporate logos, colors, and sign configurations. As a component of the City's development review process, tenant signs will be evaluated for consistency with these guidelines.

Digital Advertising Signs

Digitial Advertising Signs are allowed within the plaza area east of the Arena building, in the general area between Subareas 16 and 18, and Subareas 17 and 19. The signs will be a series of LED Billboard Screens and located in highly visible, high traffic, outdoor plaza and pedestrian corridor. The Digital Adversiting Signs may display products, brands, and businesses associated with the commercial uses in the development as well as offsite advertisements, City sponsored events, and public service announcements. An approved Master Sign Program shall be required in accordance with the Ontario Development Code to establish development standards for design, sign area, location, and use.

3.2.8.2 Sign Regulations

Sign regulations are organized to address the two (2) primary categories of signs within the Piemonte as described above: Perimeter Identity Signs and Internal Informational/Directional Signs. Individual tenant improvements signs will be addressed as a component of City's review processes for individual development proposals within the Piemonte Overlay. Of primary concern are the visual attributes of internal signs, and public perception of the signs as seen from off-site vantages.

Perimeter Identity Signs

The purpose of the Perimeter Identity Signs is to provide identification of the Piemonte Overlay at the edges and entrances and primary tenants. The character and details of these signs will interpret and reinforce general architectural themes of the Piemonte Overlay and will incorporate elements consistent with the design expressions common to prevailing architectural style(s). Perimeter Identity Signs shall be implemented consistent with the following guidelines:

Perimeter Entry Monumentation

Entry monumentation will be provided at each of the Overlay's perimeter entrances. (Please refer to the SPA topical discussion of Entry Statements). Monument signs provided at the development entrances will incorporate and reflect architectural themes exhibited by structures within the Piemonte Overlay. These signs may incorporate corporate identifiers, electronic graphics or similar visual displays. Detailed dimensions and locations of perimeter entry monument signs will be as provided for within the Piemonte Sign Program.

Perimeter Project and Tenant Identification

Perimeter and tenant identification statements will consist of horizontal or vertical monuments integrated into landscaping features along perimeter roadways. Content may include the development name and logo and names and logos of major tenants. Detailed dimensions and locations of perimeter and tenant identification monument signs will be as provided for within the Piemonte Sign Program.

Perimeter Directional Signs

Perimeter directional signs will typically be fabricated metal panels on posts, or panels mounted to lighting standards. Dimensions and general locations of perimeter directional signs will be as provided for within the Piemonte Sign Program.

Internal Informational/Directional Signs

Internal Informational/Directional Signs shall be limited to the following:

- **Vehicular Circulation**. Directional signs associated with on-site roadways and traffic circulation system.
- **Pedestrian Circulation**. Directional signs associated with on-site pedestrian walkways and corridors.
- **Interior Banners**. Banners or similar informal signs may be implemented throughout the Piemonte as a means of introducing color, variety, and as a unifying thematic element.
- **Parking Zone Markers**. Signs mounted on permanent poles to identify parking areas.

Other Regulatory Signs

Other regulatory signs, e.g., traffic controls signs, access control signs, will be provided throughout the Piemonte Overlay consistent with City or other applicable agency requirements.

Internal informational/directional signs will reflect the varied architectural themes and styles that are proposed throughout the Project. With the exception of signs mandated by City or other ordinances, dimensions and area of all Internal Informational/Directional Signs shall be as provided for within the Piemonte Sign Program.

3.8.5 Lighting

3.8.5.1 Lighting Design Guidelines

Lighting themes and fixtures will lend a varied ambience to the nighttime appearance of the Piemonte Overlay, while providing illumination that is consistent with customary municipal safety standards. A combination of light fixtures will be used to illuminate surfaces such as roadways, parking areas and walkways, as well as landscape areas and building facades. The overall effect to be achieved is a balanced composition of lighting elements consisting of warm color light for architecture and cool color light for landscaping. The utilization of varying shades of white light will bring out the most desirable color characteristics of each.

Illumination for roadways will be provided by decorative poles that are compatible with the architectural character of the Piemonte Overlay and its surroundings. Light sources will be energy-efficient fixtures selected for their durability and reliability. Finishes will be complementary to architectural and landscaping components.

Parking areas will receive "cut-off" luminaries that shield against light trespass. The fixtures will be pole-mounted and shall include optics which will allow all appropriate areas to receive an average light level of approximately 1.5 foot candles. Fixtures will be energy-efficient LED or other code compliant lights.

Facade lighting will consist of energy-efficient LED, metal halide, fluorescent, and incandescent sources. The goal will be to accent architectural building details, and to create a unified appearance for all structures. Layers of light from multiple sources will help to control contrasts and to enhance 3-dimensional perspectives.

Low level path lighting and illuminated bollards will be used to accent walkways, plazas, paseos and other pedestrian access areas. Fluorescent sources are most desirable for this type of lighting.

Metal halide and fluorescent fixtures are the primary light source that will be used to highlight planting and trees. The intent is to bring out the green of tree canopies as well as the vibrant colors of seasonal plants at grade level.

Project signs may be internally or externally illuminated, consistent with provisions of the Piemonte Sign Program.

3.8.5.2 Lighting Development Standards

All lighting along public roadways will comply with applicable City and OCSP requirements (as modified by this Overlay). Lighting and light fixtures within the Piemonte Overlay shall conform to the following standards:

- The use of lighting should be integrally designed as part of the built environment and should reflect a balance for the lighting needs with the contextual ambient light level and surrounding nighttime characteristics of the community.
- Lighting designs should be designed to minimize glare, light trespass, energy conservation, and to maintain dark skies.
- Full cut-off fixtures, mounting heights, and shielding should be utilized to effectively control glare and light trespass where possible.
- Lighting standards should support the overall intended theme of the Project.
- Lighting should be both aesthetically pleasing as well as functional.
- Lighting should meet all code requirements to properly achieve appropriate coverage.
- Lighting should provide a sense of safety and security for all site users.

All lighting within the Piemonte Overlay will be implemented and operated in conformance with Section 6.01.015.N.13 of the Ontario Development Code.

4.0 ADMINISTRATION

4.1 INTRODUCTION

Approval of the Piemonte Overlay Specific Plan Amendment (2022) indicates acceptance by the City of Ontario City Council of the general framework for the development of the Piemonte Overlay property. Part of that framework establishes specific development standards that constitute the zoning regulations for the Piemonte Overlay. The provisions contained herein regulate development within the Specific Plan area, and provide the process for review and approval of development projects within the Overlay area.

4.2 SEVERABILITY

If any portion of this Specific Plan Overlay document is declared to be invalid or ineffective in whole or in part, such decision shall not affect the validity of the remaining portions thereof. The legislative body hereby declares that they would have enacted these regulations and each portion thereof irrespective of the fact that any one or more portions be declared invalid or ineffective.

4.3 MINOR MODIFICATIONS TO THE OVERLAY

The City recognizes that modifications to the text and exhibits of this document may be needed over time. The following minor modifications to this document may be process as Specific Plan Minor Amendments, pursuant to Ontario Development Code Section 4.02.080; the reviewing authority however shall have the discretion to defer any such request for modification to the Planning Commission or City Council.

- Expansions or reductions of the net acreage covered within a Subarea.
- A decrease in development intensity/density (non-residential square footage, lodging rooms, and/or residential units).
- Modification of design criteria such as architectural details, landscape

treatments, plant matrices, fencing, lighting, and entry treatments.

- Implementation of alternative landscape materials, wall materials, wall alignment, entry monument design, and streetscape design that are generally consistent with the conceptual design guidelines contained within this Overlay.
- Modifications to Architectural Design Guidelines, such as variation of materials within a particular architectural style and variations in materials and colors.
- Modifications to Signage requirements.
- Final infrastructure facility sizing and precise location of dry utilities, water, sewer, and storm drainage improvements when directed by the City Engineer.
- Roadway alignment when the changes are warranted. Revisions to exhibits which do not substantially change the intent of the Specific Plan.
- Modification and deletions to the list of allowed uses.
- Specific modifications of a similar nature to those listed above which are deemed minor by the Planning Director, which are in keeping with the intent of this Specific Plan and which are in conformance with the City of Ontario General Plan.

4.4 AMENDMENTS TO THE OVERLAY

Amendments to the Overlay may be requested by the applicant or the City pursuant to Section 65453(a) of the Government Code. Amendments shall be processed pursuant to the provisions of the Government Code for Specific Plan Amendments and Section 4.01.035 Specific Plans and Amendments of the Ontario Development Code.

In the event the proposed amendment requires supplemental environmental analysis pursuant to the California Environmental Quality Act (CEQA), the applicant(s) are responsible for preparing the necessary CEQA documentation.

4.5 SUBDIVISION MAPS

Approval of subdivision maps may occur concurrently or subsequent to the adoption of the Overlay. All tentative and final subdivision maps shall be reviewed and approved pursuant to Division 2.02, Application Filing and Processing, and Division 6.08, Subdivisions, of the Ontario Development Code and consistent with the applicable provisions of the Land Use, Infrastructure, Development Regulations, and Design Guidelines adopted as part of the Overlay.

4.6 DEVELOPMENT REVIEW PROCESS

Development proposals within the Piemonte Overlay area are subject to review and approval by the City of Ontario through the City's review processes discussed below.

4.6.1 Development Plans

Development proposals shall be submitted to the City for consideration, pursuant to the provisions of the Development Code Division 2.02 and Division 4.02. Development Plans shall be substantially consistent with the Overlay and associated exhibits. Applications and appeals related to Development Plan Review shall conform to requirements of the Ontario Development Code.

Through the Development Plan review process, development of individual proposals will be evaluated for consistency with the land uses, facilities configurations, and Design Guidelines and Development Regulations established under the Overlay. Development Plan review will consider and evaluate such details as building architecture, design, location and orientation, development intensity, and circulation/site access.

4.6.2 Development Capacity Conversion

Any conversion of remaining development capacity shall be processed at the same time as the applicable development plan.

4.7 CONDITIONAL USE PERMIT

Conditional Use Permits shall be required in accordance with Table 5.02-1: Land Use Matrix of the Ontario Development Code. Conditional uses shall be processed pursuant to the requirements of Section 4.02.015 Conditional Use Permits of the Ontario Development Code. Conditional Use Permits adjacent to residential uses shall consider and address the following residential/commercial interface issues during the review process:

1. Parking
   - Guest
   - Personal spaces being used
2. Traffic
   - Blocked streets
   - Arena/restaurant events
3. Noise
   - People
   - Traffic/Motorcycles
   - Horns
   - Music
   - Arguments
4. Late Night Activities
   - Every night until 2 am
5. Security
   - Unwanted element
   - Sheer number of people in area
   - Strangers
6. Lack of Privacy
   - Walking
   - Jogging

- Dog Walking

7. Trash Pickup
   - Early morning noise
8. Deliveries
   - Large trucks
   - Times of day
9. Lighting
   - Overall light – amount of light
   - Lights shining in windows
10. Odors/Smell/Health
    - Kitchens/food
    - Flies and bugs
    - Rats and rodents
11. View/Appearance
    - Back of house
    - Loading areas
    - Wash out areas
12. Physical Damage
    - Walls
    - Buildings
    - Gates
    - Landscape

4.8 APPEALS

An appeal from any determination, decision, or requirement of staff, City, or Planning Commission shall conform to the appeal procedures established by Division 2.04 Appeals of the Ontario Development Code.

5.0 GENERAL PLAN CONSISTENCY

California Government Code (Title 7, Division 1, Chapter 3, Article 8, Section 65450-65457) permits the adoption and administration of Specific Plans as an implementation tool for elements contained in the local General Plan. Specific Plans must demonstrate consistency in regulations, guidelines, and programs with the goals and policies set forth in the General Plan.

The Piemonte Overlay has been prepared in conformance with the goals and policies of The Ontario Plan (TOP) Policy Plan (General Plan). The policy analysis in this Chapter describes the manner in which the Overlay complies with TOP Goals and Polices applicable to the development.

Policy Plan Goals and Policies	Overlay Consistency
LAND USE ELEMENT	
GOAL LU 1: A community that has a spectrum of housing types and price ranges that match the jobs in the City and that make it possible for people to live and work in Ontario and maintain a quality of life.	
LU 1-1 Strategic Growth. We concentrate growth in strategic locations that help create place and identify, maximizes available and planned infrastructure, and foster the development of transit.	The Overlay area is located within the Ontario Center Specific Plan (OCSP) identified in The Ontario Plan and will rely on available infrastructure. The Overlay will adhere to current approved City of Ontario Infrastructure Master Plans.
LU 1-2 Sustainable Community Strategy. We integrate state, regional and local Sustainable Community/Smart Growth principles into the development and entitlement process.	Sustainable Community/Smart Growth principles are incorporated into Land Use Plan. Pedestrian sidewalks connect the mix of land uses within the OCSP. The project will contain many energy efficient features.
LU 1-3 Adequate Capacity. We require adequate infrastructure and services for all development.	The Overlay is located in an area where planned infrastructure and public facilities have been constructed to ensure that adequate roadways and public utilities including sewer, water and drainage facilities along with parks and other public facilities are provided to serve the Overlay area.
LU 1-4 Mobility. We require development and urban design, where appropriate, that reduces reliance on the automobile and capitalizes on multi-modal transportation opportunities. (Link to Mobility Element Policy M 3-3)	The mix of residential and commercial land uses within the Overlay are within walkable distance reducing the reliance on the automobile..
LU 1-5 Jobs-Housing Balance. We coordinate land use, infrastructure, and transportation planning and analysis with regional, county and other local agencies to further regional and subregional goals for jobs-housing balance. (Link to Community Economics Element Policy CE1-1)	N/A
LU 1-6 Complete Community. We incorporate a variety of land uses and building types in our land use planning efforts that result in a complete community where residents at all stages of life, employers, workers and visitors have a wide spectrum of choices of where they can live, work, shop and recreate within Ontario. (Link to Complete Community Section of Community Economics Element)	The Overlay plans for a complete infill community with a mix of residential, commercial, and offices where residents can live, work, shop and recreate at adjacent areas.

Policy Plan Goals and Policies	Overlay Consistency
LU 1-7 Revenues and Costs. We require future amendments to our Land Use Plan to be accompanied by analyses of fiscal impacts. (Link to Community Economics Policy CE3-2)	N/A
GOAL LU 2: Compatibility between a wide range of uses.	
LU 2-1 Land Use Decisions. We minimize adverse impacts on adjacent properties when considering land use and zoning requests.	All development will be reviewed through the City's Development Plan process. Parking demand is carefully reviewed to minimize impacts on adjacent properties.
LU 2-2 Buffers. We require new uses to provide mitigation or buffers between existing uses where potential adverse impacts could occur. (Link to Community Design)	N/A
LU 2-3 Hazardous Uses. We regulate the development of industrial and similar uses that use, store, produce or transport toxic substances, air emissions, other pollutants or hazardous materials. (Link to Hazardous Materials & Waste including Policies S6-4 and S6-5)	N/A
LU 2-4 Regulation of Nuisances. We regulate the location, concentration and operations of potential nuisances.	N/A
LU 2-5 Regulation of Uses. We regulate the location, concentration and operations of uses that have impacts on surrounding land uses.	All development will be reviewed through the City's Development Plan and/or applicable CUP process.
LU 2-6 Infrastructure Compatibility. We require infrastructure to be aesthetically pleasing and in context with the community character.	The Overlay provides for an aesthetically pleasing streetscape concept.
LU 2-7 Inter-jurisdictional Coordination. We maintain an ongoing liaison with IEUA, LAWA, Caltrans, Public Utilities Commission, the railroads and other agencies to help minimize impacts and improve the operations and aesthetics of their facilities.	N/A
LU 2-8 Transitional Areas. We require development in transitional areas to protect the quality of life of current residents.	N/A
LU 2-9 Methane Gas Sites. We require sensitive land uses and new uses on former dairy farms or other methane-producing sites be designed to minimize health risks.	N/A

Policy Plan Goals and Policies	Overlay Consistency
GOAL LU3: Staff, regulations and processes that support and allow flexible response to conditions and circumstances in order to achieve the Vision.	
LU 3-1 Development Standards. We maintain clear development standards which allow flexibility to achieve our Vision.	The Overlay will set forth clear development standards compatible with the City's vision.
LU 3-2 Design Incentives. We offer design incentives to help projects achieve the Vision. (Link to Community Design)	N/A
LU 3-3 Land Use Flexibility. We consider uses not typically permitted within a land use category if doing so improves livability, reduces vehicular trips, creates community gathering places and activity nodes, and helps create identity.	The Overlay will be classified as mixed use to allow for flexible land use that will improve livability around the area by creating a pedestrian driven community, through open spaces, plazas, and entertainment.
Goal LU 4: Development that provides short-term value only when the opportunity to achieve our Vision can be preserved.	
LU 4-1 Commitment to Vision. We are committed to achieving our Vision but realize that it may take time and several interim steps to get there.	The Overlay master plan is designed to be developed in a series of phases to achieve the Vission around the Piemonte Overlay.
LU 4-2 Interim Development. We allow development in growth areas that is not immediately reflective of our ultimate Vision provided it can be modified or replaced when circumstances are right. We will not allow development that impedes, precludes or compromises our ability to achieve our Vision. (Link to Community Economics Policy CE2-3)	The Overlay development allows for areas to be utilized as temporary uses if it will facility and assist towards achieving the ultimate vision. Some areas can be used as immediate parking areas that can later be developed to achieve and accomodate the required parking.
LU 4-3 Infrastructure Timing. We require that the necessary infrastructure and services be in place prior to or concurrently with development.	Necessary infrastructure and services will be in place at occupancy.
GOAL LU5: Integrated airport facilities that minimize negative impacts to the community and maximize economic benefits.	
LU 5-1 Coordination with Airport Authorities. We collaborate with FAA, Caltrans Division of Aeronautics, airport owners, neighboring jurisdictions, and other shareholders in the preparation, update and maintenance of airport-related plans.	N/A
LU 5-2 Airport Planning Consistency. We coordinate with airport authorities to ensure The Ontario Plan is consistent with state law, federal regulations and/or adopted master plans and land use compatibility plans for the ONT and Chino Airport.	N/A

Policy Plan Goals and Policies	Overlay Consistency
LU 5-3 Airport Impacts. We work with agencies to maximize resources to mitigate the impacts and hazards related to airport operations.	N/A
LU 5-4 ONT Growth Forecast. We support and promote an ONT that accommodates 30 million annual passengers and 1.6 million tons of cargo per year, as long as the impacts associated with that level of operations are planned for and mitigated	N/A
LU 5-5 Airport Compatibility Planning for ONT. We create and maintain the Airport Land Use Compatibility Plan for ONT.	N/A
LU 5-6 Alternative Process. We fulfill our responsibilities and comply with state law with regard to the Alternative Process for proper airport land use compatibility planning.	N/A
LU 5-7 ALUCP Consistency and Land Use Regulations. We comply with state law that requires general plans, specific plans and all new development to be consistent with the policies and criteria set forth within an Airport Land Use Compatibility Plan for any public use airport.	The Overlay is located within the Airport Influence Areas of Ontario International Airport. Section 2.1.2 notifies the reader to refer to the ONT ALUCP.
LU 5-8 Chino Airport. We will support the creation and implementation of the Airport Land Use Compatibility Plan for Chino Airport.	N/A

HOUSING ELEMENT

Goal H1: Stable neighborhoods of quality housing, ample community services and public facilities, well-maintained infrastructure, and public safety that foster a positive sense of identity

H 1-1 Housing Rehabilitation. We support the rehabilitation, maintenance, and improvement of single-family, multiple-family, and mobile homes through code compliance, removal of blight where necessary, and provision of rehabilitation assistance where feasible.	N/A
H 1-2 Neighborhood Conditions. We direct efforts to improve the long-term sustainability of neighborhoods through comprehensive planning, provision of neighborhood amenities, rehabilitation and maintenance of housing, and community building efforts.	Our mixed-use project combines residential and commercial uses which will help vitalize an underutilized area.

Policy Plan Goals and Policies	Overlay Consistency
H 1-3 Community Amenities. We shall provide adequate public services, infrastructure, open space, parking and traffic management, pedestrian, bicycle and equestrian routes and public safety for neighborhoods consistent with City master plans and neighborhood plans.	The Overlay allows for plaza areas to be publicly accessible community amenities and encourages engagement with the adjacent commercial ues.
H 1-4 Historical Preservation. We support the preservation and enhancement of residential structures, properties, street designs, lot configurations, and other reminders of Ontario's past that are considered to be local historical or cultural resources.	N/A
H 1-5 Neighborhood Identity. We strengthen neighborhood identity through creating parks and recreational outlets, sponsoring neighborhood events and encouraging resident participation in the planning and improvement of their neighborhoods.	N/A
GOAL H_2: Diversity of types of quality housing that are affordable to a range of household income levels, accommodate changing demographics, and support and reinforce the economic sustainability of Ontario.	
H 2-1 Corridor Housing. We revitalize transportation corridors by encouraging the production of higher density residential and mixed-uses that are architecturally, functionally and aesthetically suited to corridors.	The design guidelines and development standards provide for development suited for adjacency to corridors. The proposed high density housing is also suitable for the adjacent Haven and Fourth Streets high traffic corridors.
2-2 Historic Downtown. We foster a vibrant historic downtown through facilitating a wide range of housing types and affordability levels for households of all ages, housing preferences, and income levels.	N/A
H 2-3 Ontario Airport Metro Center. We foster a vibrant, urban, intense and highly amenitized community in the Ontario Airport Metro Center Area through a mix of residential, entertainment, retail and office-oriented uses.	The Overlay allows for a mix of residential, entertainment, retail and potentially office-oriented uses centered around the Arena.
H 2-4 New Model Colony. We support a premier lifestyle community in the New Model Colony distinguished by diverse housing, highest design quality, and cohesive and highly amenitized neighborhoods.	N/A
H 2-5 Housing Design. We require architectural excellence through adherence to City design guidelines, thoughtful site planning, environmentally sustainable practices and other best practices.	The Overlay has its own design guidelines to achieve architectural excellence.

Policy Plan Goals and Policies	Overlay Consistency
H 2-6 Infill Development. We support the revitalization of neighborhoods through the construction of higher-density residential developments on underutilized residential and commercial sites.	The Overlay allows for development on underutilized residential and commercial sites, including high density residential developments.
Goal H3: A City regulatory environment that balances the need for creativity and excellence in residential design, flexibility and predictability in the project approval process, and the provision of an adequate supply and prices of housing.	
H 3-1 Incentives. We maintain incentive programs that can be offered to projects that provide benefits to the community such as exceptional design quality, economic advantages, environmental sustainability, or other benefits that would otherwise be unrealized.	N/A
H 3-2 Flexible Standards. We allow flexibility in the application of residential and mixed-use development standards in order to gain benefits such as exceptional design quality, economic advantages, sustainability, or other benefits that would otherwise be unrealized.	This Overlay provides flexibility in design to allow the most exceptional design quality.
H 3-3 Development Review. We maintain a residential development review process that provides certainty and transparency for project stakeholders and the public, yet allows for the appropriate review to facilitate quality housing development.	N/A
H 3-4 Financial Incentives. We consider financial incentives to facilitate and encourage the production, rehabilitation or improvement of housing, or provision of services where such activity furthers housing and community-wide goals.	N/A
GOAL H4: Increased opportunities for low and moderate income households and families to afford and maintain quality ownership and rental housing opportunities, including move-up opportunities.	
H 4-1 Preservation of Affordable Apartments. We strive to facilitate the preservation of the affordability of publicly assisted apartments for lower income households through financial assistance, technical assistance, rehabilitation, and collaborative partnerships.	N/A
H 4-2 Homeownership Opportunities. We increase and expand homeownership rates for lower and moderate income households by offering financial assistance, low-interest loans and educational resources, and by working in collaboration with partnerships.	N/A

Policy Plan Goals and Policies	Overlay Consistency
H 4-3 Rental Assistance. We support the provision of rental assistance for individuals and families earning extremely low, very low, and low income with funding from the state and federal government.	N/A
H 4-4: Mixed-income Housing. We encourage the integration of affordable housing in the New Model Colony, Ontario Airport Metro Center Area, and existing neighborhoods.	The Overlay provides for apartment living. The proposed rent range will include rents affordable to more moderate income residents.
H 4-5 Collaborative Partnerships. We support collaborative partnerships of nonprofit organizations, affordable housing developers, major employers, and for-profit developers to produce affordable housing.	N/A
H 4-6 Fair Housing. We further fair housing by prohibiting discrimination in the housing market and providing education, support, and enforcement services to address discriminatory practices	N/A
Goal H5: A full range of housing types and community services that meet the special housing needs for all individuals and families in Ontario, regardless of income level, age or other status.	
H 5-1 Senior Housing. We support the development of accessible and affordable senior housing and provide financial assistance for seniors to maintain and improve their homes.	N/A
H 5-2 Family Housing. We support the development of larger rental apartments that are appropriate for families with children, including, as feasible, the provision of services, recreation and other amenities.	The Overlay allows residential two- and three-bedroom apartments that will have access to children friendly amenities.
H 5-3 Disabled People. We increase the supply of permanent, affordable and accessible housing for people with disabilities, and provide assistance to allow them to maintain and improve their homes	Residential development in the Overlay project area will comply with ADA standards.
H 5-4 Homeless People. We partner with non-profit partners to provide emergency shelters, transitional housing, permanent supportive housing, and supportive services for people who are homeless.	N/A
H 5-5 Supportive Services. We financially support organizations, as feasible, that provide support services that meet the needs of those with special needs and further the greatest level of independence.	N/A

Policy Plan Goals and Policies	Overlay Consistency
H 5-6 Partnerships. We collaborate with non-profit organizations, private developers, employers, government agencies and other interested parties to develop affordable housing and provide support services.	N/A
PARKS AND RECREATION ELEMENT	
Goal PR1: A system of safe and accessible parks that meets the needs of the community.	
PR 1-1 Access to Parks. We strive to provide a park and/or recreational facility within walking distances (1/4 mile) of every residence.	All residents will have access to a range of on-site amenities including plazas, gathering areas, playgrounds, pools and gyms.
PR 1-2 Adjacency to Schools. We examine locating parks adjacent to school sites to promote joint-use opportunities.	N/A
PR 1-3 Funding. We shall seek outside, one-time sources of funding for capital improvements and reserve ongoing City funds primarily for operations and maintenance.	N/A
PR 1-4 Joint-use Opportunities. In areas where there is a need but no City recreational facility, we explore joint-use opportunities. (e.g., school sites).	N/A
PR 1-5 Acreage Standard. We strive to provide 5 acres of parkland (public and private) per 1,000 residents.	Park fees will be paid at the time of building permits to assist the City in its park efforts.
PR 1-6 Private Parks. We expect development to provide a minimum of 2 acres of developed private park space per 1,000 residents.	Park fees will be paid at the time of building permits.
PR 1-7 Special Needs/Universal Design. We attempt to provide recreational opportunities at parks for people of all ages and abilities.	N/A
PR 1-8 Renovation. We examine renovating existing facilities prior to building replacement facilities.	N/A
PR 1-9 Phased Development. We require parks be built in new communities before a significant proportion of residents move in.	Park fees will be paid at the time of building permits.
PR 1-10 Master Plans for Individual Park Facilities. We require an individual park master plan for parks in excess of 10 acres.	N/A

Policy Plan Goals and Policies	Overlay Consistency
PR 1-11 Environmental Function of Parks. We require new parks to meet environmental management objectives.	N/A
PR 1-12 Trails. We promote connections between parks and local trails including those managed by other public agencies.	N/A
PR 1-13 Equestrian Trails. We require the design, construction and maintenance of equestrian trails in Rural Residential designated areas.	N/A
PR 1-14 Multi-family Residential Developments. We require that new multi-family residential developments of five or more units provide recreational facilities or open space, in addition to paying adopted impact fees.	The Overlay requires that all multi-family developments within the Overlay provide private recreational areas for residents of the development in addition to the payment of park fees at the time of building permits.
PR 1-15 Trail Connectivity. We strengthen and improve equestrian, bike and multipurpose trail connections within the City and work to improve trail connections into adjacent jurisdictions.	N/A
PR 1-16 Equestrian Master Plan. We use Homer Briggs Park as the primary focal point for the development of a Master Plan of Equestrian Trails in the Rural Residential area.	N/A

ENVIRONMENTAL RESOURCES ELEMENT

GOAL ER1: A reliable and cost effective system that permits the City to manage its diverse water resources and needs.

ER 1-1 Local Water Supply. We increase local water supplies to reduce our dependence on imported water.	N/A
ER 1-2 Matching Supply to Use. We match water supply and quality to the appropriate use.	N/A
ER 1-3 Conservation. We require conservation strategies that reduce water usage.	All Overlay development will meet CALGreen low flow fixture requirements. All irrigation systems will be designed per State and/ or the City of Ontario's Water Conservation Ordinance and utilize the existing reclaimed water infrastructure system. Landscaped areas within the Overlay area will be graded as swales to the maximum extent practicable in order to maximize conservation of irrigation water and natural rainfall run-off.

Policy Plan Goals and Policies	Overlay Consistency
ER 1-4 Supply-Demand Balance. We require that available water supply and demands be balanced.	N/A
ER 1-5 Groundwater Management. We protect groundwater quality by incorporating strategies that prevent pollution, require remediation where necessary, capture and treat urban run-off, and recharge the aquifer.	The Overlay development will comply with all applicable regulations in regards to protecting groundwater quality.
ER 1-6 Urban Run-off Quantity. We encourage the use of low impact development strategies to intercept run-off, slow the discharge rate, increase infiltration and ultimately reduce discharge volumes to traditional storm drain systems.	Overlay development shall be designed to retain and in-filter, harvest and use or biotreat the Design Capture Volume of surface run-off, on-site, to comply with the current requirements of the San Bernardino County NPDES Stormwater Program's Water Quality Management (WQMP) for new development projects.
ER 1-7 Urban Run-off Quality. We require the control and management of urban run-off, consistent with Regional Water Quality Control Board regulations.	Overlay Development is obligated to minimize the impacts of urban run-off, through the implementation of on-site and off-site Low Impact Development (LID) Site Design Best Management Practices (BMPs) which retain/ in-filter, harvest and use, or biotreat the average 2-year, 24-hour storm run-off volume (85th percentile storm event) from the project, consistent with Regional Water Quality Control Board regulations as part of the County-wide NPDES Permit.
ER 1-8 Wastewater Management. We require the management of wastewater discharge and collection consistent with waste discharge requirements adopted by the Regional Water Quality Control Board.	The project is obligated to comply with wastewater discharge and collection requirements adopted by the Regional Water Quality Control Board.
Goal ER2: A cost effective, integrated waste management system that meets or exceeds state and federal recycling and waste diversion mandates.	
ER 2-1 Waste Diversion. We shall meet or exceed AB 939 requirements.	All development will comply with City construction waste diversion requirements.
ER 2-2 Hazardous and Electronic Wastes. We prohibit the disposal of hazardous and electronic waste into the municipal waste stream pursuant to state law.	N/A
ER 2-3 Purchase Products Made from Recycled Materials. We purchase recycled-content products where it is cost effective	N/A

Policy Plan Goals and Policies	Overlay Consistency
GOAL ER3: Cost-effective and reliable energy system sustained through a combination of low impact building, site and neighborhood energy conservation and diverse sources of energy generation that collectively helps to minimize the region's carbon footprint.	
ER 3-1 Conservation Strategy. We require conservation as the first strategy to be employed to meet applicable energy-saving standards.	All development within the Overlay will meet California's stringent CALGreen and Energy Codes.
ER 3-2 Green Development- Communities. We require the use of best practices identified in green community rating systems to guide the planning and development of all new communities.	The Overlay contains a broad mix of land uses, and density as identified in the best practices of several rating systems.
ER 3-3 Building and Site Design. We require new construction to incorporate energy efficient building and site design strategies, which could include appropriate solar orientation, maximum use of natural daylight, passive solar and natural ventilation.	All development within the Overlay will meet California's stringent CALGreen and Energy Codes.
ER 3-4 Green Development– Public Buildings. We require all new and substantially renovated City buildings in excess of 10,000 square feet achieve a LEED Silver Certification standard, as determined by the U.S. Green Building Council.	N/A
ER 3-5 Fuel Efficient and Alternative Energy Vehicles and Equipment. We purchase and use vehicles and equipment that are fuel efficient and meet or surpass state emissions requirements and/or use renewable sources of energy	N/A
ER 3-6 Generation. Renewable Sources. We promote the use of renewable energy sources to serve public and private sector development.	N/A
GOAL ER4: Improved indoor and outdoor air quality and reduced locally generated pollutant emissions.	
ER 4-1 Land Use. We reduce GHG and other local pollutant emissions through compact, mixed use, and transit-oriented development and development that improves the regional jobs-housing balance.	The Overlay provides for compact mix of uses that improves the regional jobs-housing balance.
ER 4-2 Sensitive Land Uses. We prohibit the future siting of sensitive land uses, within the distances defined by the California Air Resources Board for specific source categories, without sufficient mitigation.	N/A

Policy Plan Goals and Policies	Overlay Consistency
ER 4-3 Greenhouse Gases (GHG) Emissions Reductions. We will reduce GHG emissions in accordance with regional, state and federal regulations.	The Overlay complies with regional, state and federal regulations.
ER 4-4 Indoor Air Quality. We will comply with State Green Building Codes relative to indoor air quality.	Overlay development will be required to comply with all State laws in regards to indoor air quality.
ER 4-5 Transportation. We promote mass transit and non-motorized mobility options (e.g. walking, biking) to reduce air pollutant emissions.	Overlay development includes a variety of pedestrian and bicycle paths that is consistent with a walkable master plan.
ER4-6 Particulate Matter. We support efforts to reduce particulate matter to meet State and Federal Clean Air Standards.	N/A
ER4-7 Other Agency Collaboration. We collaborate with other agencies within the South Coast Air Basin to improve regional air quality at the emission source.	N/A
ER 4-8 Tree Planting. We protect healthy trees within the City and plant new trees to increase carbon sequestration and help the regional/local air quality.	Where possible, healthy existing street trees will be protected. Additional trees will be planted within the Overlay per the landscape standards and requirements.
Goal ER5 Protected high value habitat and farming and mineral resource extraction activities that are compatible with adjacent development.	
ER 5-1 Habitat Conservation Areas. We support the protection of biological resources through the establishment, restoration and conservation of high quality habitat areas.	N/A
ER 5-2 Entitlement and Permitting Process. We comply with state and federal regulations regarding protected species.	N/A
ER 5-3 Right to Farm. We support the right of existing farms to continue their operations within the New Model Colony.	N/A
ER 5-4 Transition of Farms. We protect both existing farms and sensitive uses around them as agricultural areas transition to urban uses.	N/A
ER 5-5 Mining Operations. We prohibit future mining operations where the resource extraction activities are incompatible with existing or proposed adjacent land uses.	N/A

Policy Plan Goals and Policies	Overlay Consistency
COMMUNITY ECONOMICS ELEMENT	
GOAL CE1: A complete community that provides for all incomes and stages of life.	
CE 1-1 Jobs-Housing Balance. We pursue improvement to the Inland Empire's balance between jobs and housing by promoting job growth that reduces the regional economy's reliance on out-commuting.	The Overlay allows for mixed land uses of commercial, office, and residential to promote job growth in the area.
CE 1-2 Jobs and Workforce Skills. We use our economic development resources to: 1) attract jobs suited for the skills and education of current and future City residents; 2) work with regional partners to provide opportunities for the labor force to improve its skills and education; and 3) attract businesses that increase Ontario's stake and participation in growing sectors of the regional and global economy. (Link to Social Resource Policy SR2-2)	N/A
CE 1-3 Regional Approach to Workforce Development. We work with our partners to provide workforce training and development services throughout the region recognizing that Ontario employers rely on workers living outside of the City.	N/A
CE 1-4 Business Retention and Expansion. We continuously improve two-way communication with the Ontario business community and emphasize customer service to existing businesses as part of our competitive advantage.	N/A
CE 1-5 Business Attraction. We proactively attract new and expanding businesses to Ontario in order to increase the City's share of growing sectors of the regional and global economy.	N/A
CE 1-6 Diversity of Housing. We collaborate with residents, housing providers and the development community to provide housing opportunities for every stage of life; we plan for a variety of housing types and price points to support our workforce, attract business and foster a balanced community.	The Overlay provides smaller studio to 3-bedroom apartments that will serve a diversity of households and incomes.
CE 1-7 Retail Goods and Services. We seek to ensure a mix of retail businesses that provide the full continuum of goods and services for the community.	The Overlay allows for an exciting mix of retail businesses.

Policy Plan Goals and Policies	Overlay Consistency
CE 1-8 Regional Attraction. We encourage the development and programming of regional, cultural, and entertainment destinations in Ontario. (Link to Social Resources Entertainment and Culture Policy SR5-4)	The Overlay vision encourages a regional entertainment destination around the Arena.
CE 1-9 Regional Leadership. We provide leadership for public, quasi-public, and private-sector partners that help Ontario and its residents and businesses realize our goals and achieve our Vision.	N/A
CE 1-10 Life-Long Education. We work with our partners who provide life-long learning to ensure that our residents and workforce have access to education at all stages of life. (Link to Social Resources-Education SR2-1)	N/A
CE 1-11 Socioeconomic Trends. We continuously monitor, plan for, and respond to changing socioeconomic trends.	N/A
CE 1-12 Circulation. We continuously plan and improve public transit and non-vehicular circulation for the mobility of all, including those with limited or no access to private automobiles. (Link to Mobility Public Transit)	Existing bus routes are located on adjacent streets to the Overlay, allowing residents and patrons of commercial development easy access to alternative means of transportation.
CE 1-13 Safety and Security. We invest in public safety and communicate our successes because the perception and reality of safety and security are necessary prerequisites for private investment and economic growth. (Link to Safety Element)	N/A
GOAL CE2: A City of distinctive neighborhoods, districts, and corridors, where people choose to be.	
CE 2-1 Development Projects. We require new development and redevelopment to create unique, high-quality places that add value to the community. (Link to Community Design Element)	The Overlay sets forth criteria for creating high-quality places and development. In particular, residential development expressed in a contemporary architectural vernacular will be unique to Ontario.
CE 2-2 Development Review. We require those proposing new development and redevelopment to demonstrate how their projects will create appropriately unique, functional and sustainable places that will compete well with their competition within the region.	The Overlay provides standards and guidelines to create unique, functional and sustainable places.

Policy Plan Goals and Policies	Overlay Consistency
CE 2-3 Interim Development. We require interim development that does not reflect the long-term Vision, be limited in scale of development so that the investment can be sufficiently amortized to make Vision-compatible redevelopment financially feasible.	N/A
CE 2-4 Protection of Investment. We require that new development and redevelopment protect existing investment by providing architecture and urban design of equal or greater quality.	The Overlay provides a framework for high quality architecture and urban design.
CE 2-5 Private Maintenance. We require adequate maintenance, upkeep, and investment in private property because proper maintenance on private property protects property values. (Link to Community Design Policy CD5-1)	There is an existing Piemonte at Ontario Center Property Owners Association that maintains the private drives.
CE 2-6 Public Maintenance. We require the establishment and operation of maintenance districts or other vehicles to fund the long-term operation and maintenance of the public realm whether on private land, in rights-of-way, or on publicly-owned property. (Link to Community Design Policy CD 5-1)	N/A
Goal CE3 Decision-making deliberations that incorporate the full short-term and long-term economic and fiscal implications of proposed City Council actions.	
CE 3-1 Fiscal Impact Disclosure. We require requests for City Council action to disclose the full fiscal impacts, including direct and indirect costs.	N/A
CE 3-2 General Plan Amendments. We require those proposing General Plan amendments to disclose reasonably foreseeable impacts through a fiscal analysis.	N/A
CE 3-3 Long-Term Funding Disclosure. We require those requesting City support or funding for projects or programs to disclose if and how they can be continued without further City support.	N/A
CE 3-4 Improving Fiscal Decision-Making. We periodically assess the accuracy of projections for staff time and City resources and use the assessment results to improve our fiscal decision-making process.	N/A
CE 3-5 Sustainable Development. We recognize impacts to municipal finances as an element of sustainability, and we require claims of sustainability to assess fiscal impacts.	N/A

Policy Plan Goals and Policies	Overlay Consistency
CE 3-6 Fully Funded Liability. We require long-term liabilities, such as retiree medical benefits, employee accrued leave balances and self insured liability claims, to be fully funded to ensure sound, long-term fiscal health.	N/A
CE 3-7 Programmatically Balanced Budget. We require that the annual budget include appropriations allocated in a manner to meet the goal of the programmatically balanced budget.	N/A
CE 3-8 Budget Margins. We require that the adopted budget for revenue and expenditures reflect sufficient budget margins to minimize negative impacts to City services due to economic uncertainties.	N/A
CE 3-9 Complete Comparative Context. We require that our annual budget process provide the complete comparative context for proposed new and increased funding so decision makers can fully understand the trade-offs among budget choices.	N/A
SAFETY ELEMENT	
Goal S1: Minimized risk of injury, loss of life, property damage and economic and social disruption caused by earthquake-induced and other geologic hazards.	
S 1-1: Implementation of Regulations and Standards. We require that all new habitable structures be designed in accordance with the most recent California Building Code adopted by the City, including provisions regarding lateral forces and grading.	All habitable buildings within the Overlay will be required to meet the California Building Code.
S 1-2 Entitlement and Permitting Process. We follow state guidelines and the California Building Code to determine when development proposals must conduct geotechnical and geological investigations.	All habitable buildings within the Overlay will be required to meet the California Building Code.
S 1-3 Continual Update of Technical Information. We maintain up-to-date California Geological Survey seismic hazard maps.	N/A
S 1-4 Seismically Vulnerable Structures. We conform to state law regarding unreinforced masonry structures.	N/A

Policy Plan Goals and Policies	Overlay Consistency
GOAL S2 Minimized risk of injury, loss of life, property damage and economic and social disruption caused by flooding and inundation hazards.	
S 2-1 Entitlement and Permitting Process. We follow State guidelines and building code to determine when development proposals require hydrological studies prepared by a State-certified engineer to assess the impact that the new development will have on the flooding potential of existing development down-gradient.	N/A
S 2-2 Flood Insurance. We will limit development in flood plains and participate in the National Flood Insurance Program.	N/A
S 2-3 Facilities that Use Hazardous Materials. We comply with state and federal law and do not permit facilities using, storing, or otherwise involved with substantial quantities of on-site hazardous materials to be located in the 100 year flood zone unless all standards of elevation, flood proofing and storage have been implemented to the satisfaction of the Building Department.	N/A
S 2-4 Prohibited Land Uses. We prohibit the development of new essential and critical facilities in the 100-year floodplain.	N/A
S 2-5 Storm Drain System. We maintain and improve the storm drain system to minimize flooding. (Link to Environmental Resources)	N/A
S 2-6 Use of Flood Control Facilities. We encourage joint use of flood control facilities as open space or other types of recreational facilities.	N/A
Goal S3: Reduced risk of death, injury, property damage and economic loss due to fires, accidents and normal everyday occurrences through prompt and capable emergency response.	
S 3-1 Prevention Services. We proactively mitigate or reduce the negative effects of fire, hazardous materials release, and structural collapse by implementing the adopted Fire Code.	All buildings and site design will comply with the California Fire Code.
S 3-2 Community Outreach. We provide education to local schools and community groups to promote personal and public safety.	N/A

Policy Plan Goals and Policies	Overlay Consistency
S 3-3 Fire and Emergency Medical Services. We maintain sufficient fire stations, equipment and staffing to respond effectively to emergencies.	N/A
S 3-4 Special Team Services. We maintain effective special rescue services.	N/A
S 3-5 Emergency Communication Services. We maintain a 9-1-1 emergency communication and dispatch center.	N/A
S 3-6 Interagency Cooperation. In order to back up and supplement our capabilities to respond to emergencies, we participate in the California Fire Rescue and Mutual Aid Plan.	N/A
S 3-7 Water Supply and System Redundancy. We monitor our water system to manage firefighting water supplies.	N/A
S 3-8: Fire Prevention through Environmental Design. We require new development to incorporate fire prevention consideration in the design of streetscapes, sites, open space and buildings. (Link to Community Design Element)	All development within the Overlay incorporates fire prevention considerations in the design of streetscapes, sites, open spaces and buildings and will be verified for compliance during the review process.
S 3-9 Resource Allocation. We analyze fire data to evaluate the effectiveness of our fire prevention and reduction strategies and allocate resources accordingly.	N/A
Goal S4 An environment where noise does not adversely affect the public's health, safety, and welfare.	
S 4-1 Noise Mitigation. We utilize the City's Noise Ordinance, building codes and subdivision and development codes to mitigate noise impacts.	All habitable buildins withing the Overlay will be required to meet the City's Noise Ordinance, California Building Code and subdivision and develoment codes to mitigate noise impact.
S 4-2 Coordination with Transportation Authorities. We collaborate with airport owners, FAA, Caltrans, SANBAG, SCAG, neighboring jurisdictions, and other transportation providers in the preparation and maintenance of, and updates to transportation-related plans to minimize noise impacts and provide appropriate mitigation measures.	N/A

Policy Plan Goals and Policies	Overlay Consistency
S 4-3 Airport Noise Mitigation. We aggressively pursue funding and utilize programs to reduce effects of aircraft noise in impacted areas of our community. (Link to Land Use Element and Quiet Home Program)	N/A
S 4-4 Truck Traffic. We manage truck traffic to minimize noise impacts on sensitive land uses. (Link to Mobility Element)	N/A
S 4-5 Roadway Design. We design streets and highways to minimize noise impacts.	N/A
S 4-6 Airport Noise Compatibility. We utilize information from Airport Land Use Compatibility Plans to prevent the construction of new noise sensitive land uses within airport noise impact zones.	The Overlay complies with the ALUCP for Ontario International Airport.
Goal S5: Reduced risk of injury, property damage and economic loss resulting from windstorms and wind- related hazards.	
S 5-1 Backup Power in Critical Facilities. We require backup power be maintained in critical facilities.	N/A
S 5-2 Dust Control Measures. We require the implementation of Best Management Practices for dust control at all excavation and grading project.	Construction within the Overlay will comply with all mitigation measures identified in the project EIR with regard to dust control.
S 5-3 Grading in High Winds. We prohibit excavation and grading during strong wind conditions, as defined by the Building Code.	The Overlay complies with the Building Code.
Goal S6 Reduced potential for hazardous materials exposure and contamination.	
S 6-1 Disclosure and Notification. We enforce disclosure laws that require all users, producers, and transporters of hazardous materials and wastes to clearly identify the materials that they store, use or transport.	N/A
S 6-2 Response to Hazardous Materials Releases. We respond to hazardous materials incidents and coordinate these services with other jurisdictions.	N/A
S 6-3 Safer Alternatives. We minimize our use of hazardous materials by choosing non-toxic alternatives that do not pose a threat to the environment.	N/A

Policy Plan Goals and Policies	Overlay Consistency
S 6-4 Safe Storage and Maintenance Practices. We require that the users of hazardous materials be adequately prepared to prevent and mitigate hazardous materials releases.	N/A
S 6-5 Location of Hazardous Material Facilities. We regulate facilities that will be involved in the production, use, storage or disposal of hazardous materials, pursuant to federal, state, county, and local regulations, so that impacts to the environment and sensitive land uses are mitigated.	N/A
S 6-6 Location of Sensitive Land Uses. We prohibit new sensitive land uses from locating within airport Safety Zones and near existing sites that use, store, or generate large quantities of hazardous materials. (Link to Land Use Element)	N/A
S 6-7 Household Hazardous Waste. We support the proper disposal of household hazardous substances.	N/A
S 6-8 Mitigation and Remediation of Groundwater Contamination. We actively participate in local and regional efforts directed at both mitigating environmental exposure to contaminated groundwater and taking action to clean up contaminated groundwater once exposure occurs.	N/A
S 6-9 Remediation of Methane. We require development to assess and mitigate the presence of methane, per regulatory standards and guidelines.	N/A
Goal S7: Neighborhoods and commercial and industrial districts that are kept safe through a multi-faceted approach of prevention, suppression, community involvement and a system of continuous monitoring.	
S 7-1 Police Unit Response. We respond to calls for service in a timely manner.	N/A
S 7-2 Community Oriented Problem Solving (C.O.P.S.). We support and maintain the mission of COPS to identify and resolve community problems.	N/A
S 7-3 Prevention Services. We provide crime prevention programs targeted to youth, parents, seniors, businesses, and neighborhoods.	N/A

Policy Plan Goals and Policies	Overlay Consistency
S 7-4: Crime Prevention through Environmental Design (CPTED). We require new development to incorporate CPTED in the design of streetscapes, sites, open spaces and buildings.	All new development will be reviewed and approved pursuant to the provisions of the City's Subdivision Ordinance and Development Plan Review process which provides for review by the City's Police Department and that may require the development to incorporate CPTED in the design of streetscapes, sites, and buildings.
S 7-5 Interdepartmental Coordination. We utilize all City departments to help reduce crime and promote public safety.	N/A
S 7-6 Partnerships. We partner with other local, state and federal law enforcement agencies and private security providers to enhance law enforcement service to Ontario.	N/A
S 7-7 Resource Allocation. We analyze crime data to evaluate the effectiveness of crime prevention and reduction strategies and allocate resources accordingly.	N/A
MOBILITY ELEMENT	
GOAL M1: A system of roadways that meets the mobility needs of a dynamic and prosperous Ontario.	
M 1-1: Roadway Design and Maintenance. We require our roadways to: • Comply with federal, state and local design and safety standards. • Meet the needs of multiple transportation modes and users. • Handle the capacity envisioned in the Functional Roadway Classification Plan. • Maintain a peak hour Level of Service (LOS) E or better at all intersections. • Be compatible with the streetscape and surrounding land uses. • Be maintained in accordance with best practices and our Right-of-Way Management Plan.	The Overlay complies with federal, state and local design and safety standards. It is consistent with the requirements of the City's Functional Roadway Classification Plan.
M 1-2: Mitigation of Impacts. We require development to mitigate its traffic impacts.	All development will implement all traffic mitigation measures, standard conditions and project design features identified in the project EIR.

Policy Plan Goals and Policies	Overlay Consistency
M 1-3 Roadway Improvements. We work with Caltrans, SANBAG and others to identify, fund and implement needed improvements to roadways identified in the Functional Roadway Classification Plan.	N/A
M 1-4 Adjacent Jurisdictions. We work with neighboring jurisdictions to meet our level of service standards at the City limits.	Street improvements along 4th Street will have been approved by the City of Rancho Cucamonga.
GOAL M_2: A system of trails and corridors that facilitate and encourage bicycling and walking.	
M 2-1 Bikeway Plan. We maintain our Multipurpose Trails & Bikeway Corridor Plan to create a comprehensive system of on- and off-street bikeways that connect residential areas, businesses, schools, parks, and other key destination points.	Existing bike lanes on public streets will remain.
M 2-1 Bikeway Plan. We maintain our Multipurpose Trails & Bikeway Corridor Plan to create a comprehensive system of on- and off-street bikeways that connect residential areas, businesses, schools, parks, and other key destination points.	N/A
M 2-3: Pedestrian Walkways. We require walkways that promote safe and convenient travel between residential areas, businesses, schools, parks, recreation areas, and other key destination points. (Link to Community Design CD 3-1)	Pedestrian walkways are planned throughout the Overlay area, promoting safe and convenient travel between destination points.
M 2-4 Network Opportunities. We explore opportunities to expand the pedestrian and bicycle networks. This includes consideration of utility easements, levees, drainage corridors, road right-of-ways, medians and other potential options.	N/A
GOAL M_3: A public transit system that is a viable alternative to automobile travel and meets the basic transportation needs of the transit dependent.	
M 3-1 Transit Partners. We maintain a proactive working partnership with transit providers to ensure that adequate public transit service is available.	N/A
M 3-2 Transit Facilities at New Development. We require new development to provide transit facilities, such as bus shelters, transit bays and turnouts, as necessary.	Transit facilities are located on adjacent or nearby streets.

Policy Plan Goals and Policies	Overlay Consistency
M 3-3 Transit-Oriented Development. We may provide additional development-related incentives to those inherent in the Land Use Plan for projects that promote transit use.	N/A
M 3-4 Bus Rapid Transit (BRT) Corridors. We work with regional transit agencies to implement BRT service to target destinations and along corridors, as shown in the Transit Plan.	N/A
M 3-5 Light Rail. We support extension of the Metro Rail Gold Line to Ontario, and will work to secure station locations adjacent to the Meredith site and at the proposed multimodal transit center.	N/A
M 3-6 Metrolink Expansion. We advocate expansion of Metrolink service to include the Downtown and the multimodal transit center.	N/A
M 3-7 High Speed Rail. We encourage the development of high-speed rail systems that would enhance regional mobility in Southern California and serve the City of Ontario.	N/A
M 3-8 Feeder Systems. We work with regional transit agencies to secure convenient feeder service from the Metrolink station and the proposed multimodal transit center to employment centers in Ontario.	N/A
M 3-9 Ontario Airport Metro Center Circulator. We will explore development of a convenient mobility system, including but not limited to shuttle service, people mover, and shared car system, for the Ontario Airport Metro Center.	N/A
M 3-10 Multimodal Transit Center. We intend to ensure the development of a multimodal transit center near LAONT airport to serve as a transit hub for local buses, BRT, the Gold Line, high-speed rail, the proposed Ontario Airport Metro Center circulator and other future transit modes.	N/A
M 3-11 Transit and Community Facilities. We require the future development of community-wide serving facilities to be sited in transit-ready areas that can be served and made accessible by public transit. Conversely, we plan (and coordinate with other transit agencies to plan) future transit routes to serve existing community facilities.	N/A

Policy Plan Goals and Policies	Overlay Consistency
Goal M4 An efficient flow of goods through the City that maximizes economic benefits and minimizes negative impacts	
M 4-1 Truck Routes. We designate and maintain a network of City truck routes that provide for the effective transport of goods while minimizing negative impacts on local circulation and noise-sensitive land uses, as shown in the Truck Routes Plan.	N/A
M 4-2 Regional Participation. We work with regional and subregional transportation agencies to plan and implement goods movement strategies, including those that improve mobility, deliver goods efficiently and minimize negative environmental impacts (Link to Environmental Resources Policy ER4-3)	N/A
M 4-3 Railroad Grade Separations. We eliminate at-grade rail crossings identified on the Functional Roadway Classification Plan.	N/A
M 4-4 Environmental Considerations. We support efforts to reduce/eliminate the negative environmental impacts of goods movement.	N/A
M 4-5 Air Cargo. We support and promote a LAONT airport that accommodates 1.6 million tons of cargo per year, as long as the impacts associated with that level of operations are planned for and mitigated.	N/A
Goal M5 A proactive leadership role to help identify and facilitate implementation of strategies that address regional transportation challenges.	
M 5-1 Regional Leadership. We maintain a leadership role to help identify and implement potential solutions to long-term regional transportation problems.	N/A
M 5-2 Land Use Compatibility with Regional Transportation Facilities. We work with LAWA, railroads, Caltrans, SANBAG, and other transportation agencies to minimize impacts.	N/A
Goal LU5: Integrated airport systems and facilities that minimize negative impacts to the community and maximize economic benefits.	
LU 5-1 Coordination with Airport Authorities. We collaborate with FAA, Caltrans Division of Aeronautics, airport owners, neighboring jurisdictions, and other shareholders in the preparation, update and maintenance of airport-related plans.	N/A

Policy Plan Goals and Policies	Overlay Consistency
LU 5-2 Airport Planning Consistency. We coordinate with airport authorities to ensure The Ontario Plan is consistent with state law, federal regulations and/or adopted master plans and land use compatibility plans for the ONT and Chino Airport.	N/A
LU 5-3 Airport Impacts. We work with agencies to maximize resources to mitigate the impacts and hazards related to airport operations.	N/A
LU 5-4 ONT Growth Forecast. We support and promote an ONT that accommodates 30 million annual passengers and 1.6 million tons of cargo per year, as long as the impacts associated with that level of operations are planned for and mitigated.	N/A
LU 5-5 Airport Compatibility Planning for ONT. We create and maintain the Airport Land Use Compatibility Plan for ONT.	N/A
LU 5-6 Alternative Process. We fulfill our responsibilities and comply with state law with regard to the Alternative Process for proper airport land use compatibility planning.	N/A
LU 5-7 ALUCP Consistency with Land Use Regulations. We comply with state law that requires general plans, specific plans and all new development be consistent with the policies and criteria set forth within an Airport Land Use Compatibility Plan for any public use airport.	The Overlay is located within the Airport Influence Areas of Ontario International Airport. Section 2.1.2. notifies the reader to refer to ONT ALUCP.
LU 5-8 Chino Airport. We will support the creation and implementation of the Airport Land Use Compatibility Plan for Chino Airport.	N/A
COMMUNITY DESIGN ELEMENT	
GOAL CD1: A dynamic, progressive city containing distinct neighborhoods and commercial districts that foster a positive sense of identity and belonging among residents, visitors, and businesses.	
CD1-1 City Identity. We take actions that are consistent with the City being a leading urban center in Southern California while recognizing the diverse character of our existing viable neighborhoods.	N/A
CD 1-2 Growth Areas. We require development in growth areas to be distinctive and unique places within which there are cohesive design themes.	The Design Guidelines set forth a clear and cohesive design theme by providing a set of unique design criteria for site planning, architectural styles, landscaping, and walls and fences.

Policy Plan Goals and Policies	Overlay Consistency
CD 1-3 Neighborhood Improvement. We require viable existing residential and non-residential neighborhoods to be preserved, protected, and enhanced in accordance with our land use policies.	N/A
CD 1-4 Transportation Corridors. We will enhance our major transportation corridors within the City through landscape, hardscape, signage and lighting.	N/A
CD 1-5 View Corridors. We require all major north-south streets be designed and redeveloped to feature views of the San Gabriel Mountains, which are part of the City's visual identity and a key to geographic orientation. Such views should be free of visual clutter, including billboards and may be enhanced by framing with trees.	Haven Avenue provides view of the San Gabriel Mountains.
GOAL CD_2: A high level of design quality resulting in public spaces, streetscapes, and developments that are attractive, safe, functional and district.	
CD 2-1: Quality Architecture. We encourage all development projects to convey visual interest and character through: • building volume, massing, and height to provide appropriate scale and proportion; • a true architectural style which is carried out in plan, section and elevation through all aspects of the building and site design and appropriate for its setting; and • exterior building materials that are visually interesting, high quality, durable, and appropriate for the architectural style.	The Design Guidelines set forth a clear and cohesive design theme by providing a set of unique design criteria for architecture, landscaping, and walls and fences.

Policy Plan Goals and Policies	Overlay Consistency
CD 2-2 Neighborhood Design. We create distinct residential neighborhoods that are functional, have a sense of community, emphasize livability and social interaction, and are uniquely identifiable places through such elements as: • a pattern of smaller, walkable blocks that promote access, activity and safety; • variable setbacks and parcel sizes to accommodate a diversity of housing types; • traffic calming measures to slow traffic and promote walkability while maintaining acceptable fire protection and traffic flows; • floor plans that encourage views onto the street and de-emphasize the visual and physical dominance of garages (introducing the front porch as the "outdoor living room"}, as appropriate; and • landscaped parkways, with sidewalks separated from the curb.	The Design Guidelines provide for distinct residential neighborhoods that are functional, have a sense of community, emphasize livability and social interaction, and are uniquely identifiable places.
CD 2-3 Commercial Centers. We desire commercial centers to be distinctive, pedestrian friendly, functional and vibrant with a range of businesses, places to gather, and connectivity to the neighborhoods they serve.	The Design Guidelines set forth a clear and cohesive design theme for pedestrian-friendly, vibrant retail areas.
CD 2-4 Mixed Use, Urban Office and Transit Serving Areas. We require mixed use, urban office and transit serving areas to be designed and developed as pedestrian oriented "villages" that promote a vibrant, comfortable and functional environment.	The Design Guidelines set forth a clear and cohesive design theme for pedestrian-friendly, vibrant retail areas.
CD 2-5: Streetscapes. We design new and, when necessary, retrofit existing streets to improve walkability, bicycling and transit integration, strengthen connectivity, and enhance community identity through improvements to the public right of way such as sidewalks, street trees, parkways, curbs, street lighting and street furniture.	The Circulation Plan is designed to accommodate pedestrians, bicycles and autos.

Policy Plan Goals and Policies	Overlay Consistency
CD 2-6: Connectivity. We promote development of local street patterns and pedestrian networks that create and unify neighborhoods, rather than divide them, and create cohesive and continuous corridors, rather than independent "islands" through the following means: local street patterns that provide access between subdivisions and within neighborhoods and discourage through traffic; a local street system that is logical and understandable for the user. A grid system is preferred to avoid circuitous and confusing travel paths between internal neighborhood areas and adjacent arterials; and neighborhoods, centers, public schools, and parks that are linked by pedestrian greenways open space networks. These may also be used to establish clear boundaries between distinct neighborhoods and/or centers.	The Circulation Plan is designed for connectivity that unifies neighborhoods and promotes walkability.
CD 2-7: Sustainability. We collaborate with the development community to design and build neighborhoods, streetscapes, sites, outdoor spaces, landscaping and buildings to reduce energy demand through solar orientation, maximum use of natural daylight, passive solar and natural ventilation, building form, mechanical and structural systems, building materials and construction techniques.	All buildings will meet or exceed California's stringent CALGreen and California Energy Codes reducing energy demand.
CD 2-8: Safe Design. We incorporate defensible space design into new and existing developments to ensure the maximum safe travel and visibility on pathways, corridors, and open space and at building entrances and parking areas by avoiding physically and visually isolated spaces, maintenance of visibility and accessibility, and use of lighting.	The Overlay encourages "eyes on the street" for neighborhood safety and security.
CD 2-9: Landscape Design. We encourage durable landscaping materials and designs that enhance the aesthetics of structures, create and define public and private spaces, and provide shade and environmental benefits.	The Overlay landscape enhances the aesthetics of structures, creates and defines public and private spaces, and provides shade.
CD 2-10 Surface Parking Areas. We require parking areas visible to or used by the public to be landscaped in an aesthetically pleasing, safe and environmentally sensitive manner. Examples include shade trees, pervious surfaces, urban run-off capture and infiltration, and pedestrian paths to guide users through the parking field.	The Overlay contains guidelines for surface parking areas.

Policy Plan Goals and Policies	Overlay Consistency
CD 2-11: Entry Statements. We encourage the inclusion of amenities, signage and landscaping at the entry to neighborhoods, commercial centers, mixed use areas, industrial developments, and public places that reinforce them as uniquely identifiable places.	The Overlay contains guidelines for neighborhood entries and monumentation.
CD 2-12: Site and Building Signage. We encourage the use of sign programs that utilize complementary materials, colors, and themes. Project signage should be designed to effectively communicate and direct users to various aspects of the development and complement the character of the structures.	The Overlay contains guidelines for neighborhood entries and monumentation.
CD 2-13 Entitlement Process. We work collaboratively with all stakeholders to ensure a high degree of certainty in the efficient review and timely processing of all development plans and permits.	N/A
CD 2-14 Availability of Information. We provide easy access to information for developers, builders and the public about design quality, construction quality, and sustainable building practices.	N/A
CD 2-15 Leverage Professional and Trade Organizations. We support excellence in design and construction quality through collaboration with trade and professional organizations that provide expertise, resources and programs for developers, builders and the public.	N/A
GOAL CD3: Vibrant urban environments that are organized around intense buildings, pedestrian and transit areas, public plazas, and linkages between and within developments that are conveniently located, visually appealing, and safe during all hours.	
CD 3-1 Design. We require that pedestrian, vehicular, bicycle and equestrian circulation on both public and private property be coordinated and designed to maximize safety, comfort and aesthetics. (Link to Bicycle and Pedestrians Section of the Mobility Element and Policies M2-3 and M2-4)	The Overlay is designed for pedestrian accessibility throughout the community through a network of on-street sidewalks, plazas, and other open space designs. Bicycle corridors are located on Haven Avenue, and Fourth Street and on Inland Empire Boulevard to the south of the Overlay.

Policy Plan Goals and Policies	Overlay Consistency
CD 3-2 Connectivity Between Streets, Sidewalks, Walkways and Plazas. We require landscaping and paving be used to optimize visual connectivity between streets, sidewalks, walkways and plazas for pedestrians.	Landscaping and paving are used to maintain a visual connectivity between streets, sidewalks, and walkways for pedestrians.
CD 3-3 Building Entrances. We require all building entrances to be accessible and visible from adjacent streets, sidewalks or public open spaces. (Link to Safety Element Policy S 7-4)	The Overlay guidelines for doors and entries promote the interface between public and private spaces.
CD 3-4 Ground Floor Usage of Commercial Buildings. We create lively pedestrian streetscapes by requiring the location of uses, such as shopping, galleries, restaurants, etc., on ground floors adjacent to sidewalks.	The Overlay allows for lively pedestrian streetscapes.
CD 3-5 Paving. We require sidewalks and road surfaces to be of a type and quality that contributes to the appearance and utility of streets and public spaces.	Sidewalks and landscaping contribute to the appearance of streets and public spaces.
CD 3-6 Landscaping. We utilize landscaping to enhance the aesthetics, functionality and sustainability of streetscapes, outdoor spaces and buildings.	The landscape guidelines enhance the streetscapes and outdoor spaces.
CD 3-7 Transit Stops. We require transit stops be well lit, safe, appealing to and accessible by pedestrians.	N/A
Goal CD4: Historic buildings, streets, landscapes and neighborhoods, as well as the story of Ontario's people, businesses, and social and community organizations, that have been preserved and serve as a focal point for civic pride and identity.	
CD 4-1 Cultural Resource Management. We update and maintain an inventory of historic sites and buildings, professional collections, artifacts, manuscripts, photographs, documents, maps and other archives.	N/A
CD 4-2 Collaboration with Property Owners and Developers. We educate and collaborate with property owners and developers to implement strategies and best practices that preserve the character of our historic buildings, streetscapes and unique neighborhoods.	N/A
CD 4-3 Collaboration with Outside Agencies. We pursue opportunities to team with other agencies, local organizations and non-profits in order to preserve and promote Ontario's heritage.	N/A

Policy Plan Goals and Policies	Overlay Consistency
CD 4-4 Incentives. We use the Mills Act and other federal, state, regional and local programs to assist property owners with the preservation of select properties and structures.	N/A
CD 4-5 Adaptive Reuse. We actively promote and support the adaptive reuse of historic sites and buildings to preserve and maintain their viability.	N/A
CD 4-6 Promotion of Public Involvement in Preservation. We engage in programs to publicize and promote the City's and the public's involvement in preservation efforts.	N/A
CD 4-7 Public Outreach. We provide opportunities for our residents to research and learn about the history of Ontario through the Planning Department, Museum of History and Art, Ontario and the Robert E. Ellingwood Model Colony History Room.	N/A
GOAL CD_5: A sustained level of maintenance and improvement of properties, buildings and infrastructure that protects the property values and encourages public and private investments.	
CD 5-1 Maintenance of Buildings and Property. We require all public and privately owned buildings and property (including trails and easements) to be properly and consistently maintained.	There is an existing Piemonte at Ontario Center Property Owners Association that maintains the private drives.
CD 5-2 Maintenance of Infrastructure. We require the continual maintenance of infrastructure.	There is an existing Piemonte at Ontario Center Property Owners Association that maintains the private drives.
CD 5-3 Improvements to Property & Infrastructure. We provide programs to improve property and infrastructure.	N/A
CD 5-4 Neighborhood Involvement. We encourage active community involvement to implement programs aimed at the beautification and improvement of neighborhoods.	N/A
SOCIAL SERVICES ELEMENT	
Goal SR_1: A community where residents have access to information, services and goods that improve their health and well being.	
SR 1-1 Partnering for Healthcare. We work with healthcare providers, and local, regional, state and federal agencies to attract and retain a diversity of affordable, quality healthcare and facilities for the entire community.	N/A

Policy Plan Goals and Policies	Overlay Consistency
SR 1-2 Nutrition Choices. We support the promotion of healthy nutritional food choices in the community.	N/A
SR 1-3 Health Education. We promote health education, including disease prevention, mental health, nutrition and physical fitness.	N/A
SR 1-4 Physical Activity. We encourage activities and community design that improve the physical fitness of our community members.	N/A
Goal SR2: A range of educational and training opportunities for residents and workers of all ages and abilities that improves their life choices and provides a skilled workforce for our businesses.	
SR 2-1 Educational Partners. We partner with educational institutions throughout the region in order to expand the range and quality of educational offerings available to the community.	N/A
SR 2-2 Workforce Training. We will work with industrial organizations, businesses and educational institutions to create opportunities for workforce training.	N/A
SR 2-3 Joint Use of Facilities. We partner with public and private educational institutions to jointly use facilities for both City and educational purposes.	N/A
SR 2-4 Access to Schools. We work with local and regional partners to improve the safety in and around schools and to improve access for citizens of all ages and abilities to schools and community services, such as after school and other programs.	N/A
SR 2-5 School Facilities. We plan and coordinate with school districts for designing and locating school facilities to meet the City's goals, such as for health, walkability, and safety and to minimize impacts to existing neighborhoods.	N/A
Goal SR3: A range of community and leisure programs and activities provided by public, private and non-profit organizations that meet the needs of the community's varied interests, age groups and abilities.	
SR 3-1 Partnerships. We partner with local and regional agencies, non-profit organizations and the private sector to provide a comprehensive range of community activities and events to citizens.	N/A

Policy Plan Goals and Policies	Overlay Consistency
SR 3-2 Needs Assessment. We track the needs and priorities for community services and look for ways to meet demands and avoid duplication of offerings.	N/A
SR 3-3 Program Outreach. We promote information about leisure activities, classes, special events and other services and activities to our community.	N/A
SR 3-4 Community Events. We plan and actively participate in regularly scheduled community events and seasonal or yearly citywide events.	N/A
SR 3-5 Community Activities as Crime Deterrents. We promote and participate in community activities as part of our crime prevention efforts. (Link to Safety Element Policy S7-3)	N/A
Goal SR4: City libraries that connect community members of all ages and abilities to a broad range of programs, communication and informational resources.	
SR 4-1 Community Needs. We identify and monitor community needs for library services, technologies and facilities, and tailor them to effectively meet those needs.	N/A
SR 4-2 Interagency Coordination. We leverage relationships with outside agencies, educational institutions and neighboring jurisdictions to share library resources to the benefit of Ontario residents.	N/A
SR 4-3 Library Outreach. We outreach to the community to increase the patronage of the library.	N/A
SR 4-4 Coordination with Other Community Services. We coordinate library programs with other recreational and community programs and facilities.	N/A
SR 4-5 Focal Points of the Community. We design and program Ontario's libraries as focal points for community engagement, including public outreach and community events.	N/A

Policy Plan Goals and Policies	Overlay Consistency
SR 4-6 Robert E. Ellingwood Model Colony History Room. We work with the Museum of History and Art, Ontario in order to collect, preserve and display artifacts and images from Ontario's heritage and connect the City's past to the present through the History Room.	N/A
Goal SR5: Local heritage, entertainment and cultural experiences that enrich the lives of Ontario's residents, workers, and visitors and serve to attract residents and businesses to the City.	
SR 5-1 Provision of Entertainment and Culture. We support a range of entertainment and cultural experiences such as public art, exhibitions and performances.	The Overlay allows for an entertainment district surrouding the Arena and would include a series of open plazas to encourage the possibility for public art, exhibitions and performances.
SR 5-2 Local Heritage Education. We partner with educational providers to promote culture and heritage. (Link to Historic Preservation Section of Community Design Element)	N/A
SR 5-3 Public Art. We encourage public art in buildings, parks, open spaces and other public and private spaces.	N/A
SR 5-4 Private-Public Sector Events. We partner with private and nonprofit sectors to provide and promote participation in cultural activities including fairs, festivals and other events geared to neighborhoods, the City as a whole and the region.	N/A
SR 5-5 Promotion of Ontario Artists and Musicians. We promote awareness of entertainment and culture produced in Ontario.	N/A

APPENDIX A - LEGAL DESCRIPTION

NO. OF PARCELS: 32
1 REMAINDER PARCEL
GROSS ACREAGE = 119.83
NET ACREAGE = 117.36

SHEET 1 OF 14 SHEETS

PARCEL MAP NO. 17550

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO,
STATE OF CALIFORNIA

BEING A SUBDIVISION OF ALL OF PARCEL 2 OF PARCEL MAP NO. 16056, AS PER MAP FILED IN BOOK 199, PAGES 96 AND 97 OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, AND ALL OF LOTS 1, 4, 5, AND ALL OF THE REMAINDER OF TRACT MAP NO. 16666, AS PER MAP FILED IN BOOK 302, PAGES 55 AND 56 OF MAPS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

LENNY GUYETT P.L.S. 7993
FEBRUARY 15, 2006

OWNER'S STATEMENT

WE HEREBY STATE THAT WE ARE ALL AND THE ONLY PARTIES HAVING ANY RECORD TITLE INTEREST IN THE LAND SUBDIVIDED AS SHOWN ON THE ANNEXED MAP, AND WE HEREBY CONSENT TO THE PREPARATION AND RECORDATION OF THIS PARCEL MAP.

WE HEREBY RESERVE FOR OURSELVES, OUR SUCCESSORS AND ASSIGNS A PRIVATE EASEMENT FOR STREET, PRIVATE UTILITY, AND MAINTENANCE PURPOSES IN, OVER, UNDER, AND ACROSS PRIVATE STREETS VIA ASTI, VIA PIEMONTE, VIA ALBA, VIA VILLAGIO, AND VIA TURIN AS SHOWN ON THE ANNEXED MAP.

WE HEREBY DEDICATE TO THE CITY OF ONTARIO FOR PUBLIC STREET AND UTILITY PURPOSES, ONTARIO CENTER PARKWAY AS SHOWN ON THE ANNEXED MAP.

WE HEREBY DEDICATE TO THE CITY OF ONTARIO A 10 FOOT EASEMENT FOR PEDESTRIAN ACCESS PURPOSES, TO BE MAINTAINED BY THE PROPERTY OWNERS, AS SHOWN ON THE ANNEXED MAP.

WE HEREBY DEDICATE TO THE CITY OF ONTARIO A 10.5 FOOT EASEMENT FOR PEDESTRIAN ACCESS AND PUBLIC UTILITY PURPOSES, TO BE MAINTAINED BY THE PROPERTY OWNERS, AS SHOWN ON THE ANNEXED MAP.

WE HEREBY DEDICATE TO THE CITY OF ONTARIO A PUBLIC EASEMENT FOR EMERGENCY ACCESS, AND PUBLIC UTILITY PURPOSES IN, OVER, UNDER, AND ACROSS PRIVATE STREETS VIA ASTI, VIA PIEMONTE, VIA ALBA, VIA VILLAGIO, AND VIA TURIN AS SHOWN ON THE ANNEXED MAP.

THE CITY OF ONTARIO, A CALIFORNIA MUNICIPAL CORPORATION

BY: _____
ROBERT HEITZMAN

THE ONTARIO REDEVELOPEMENT AGENCY, A PUBLIC BODY, CORPORATE AND POLITIC

BY: _____
ROBERT HEITZMAN

NOTARY ACKNOWLEDGMENT

STATE OF CALIFORNIA)
ss
COUNTY OF SAN BERNARDINO)

ON SEPTEMBER 11, 2006, BEFORE ME, Traci R McGinley, Notary, PERSONALLY APPEARED ROBERT HEITZMAN, PERSONALLY KNOWN TO ME (OR PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE) TO BE THE PERSON(S) WHOSE NAME(S) IS(ARE) SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/~~SHE/THEY~~ EXECUTED THE SAME IN HIS/~~HER/THEIR~~ AUTHORIZED CAPACITY(~~IES~~), AND THAT BY HIS/~~HER/THEIR~~ SIGNATURE(~~S~~) ON THE INSTRUMENT THE PERSON(~~S~~) OR THE ENTITY UPON BEHALF OF WHICH THE PERSON(~~S~~) ACTED, EXECUTED THE INSTRUMENT.

WITNESS MY HAND AND OFFICIAL SEAL

SIGNATURE _____
TRACI R. MCGINLEY

COMMISSION # 1483449
APRIL 13, 2008

NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE — MY COMMISSION EXPIRES

MY PRINCIPAL PLACE OF BUSINESS IS SAN BERNARDINO COUNTY.

NOTARY ACKNOWLEDGMENT

STATE OF CALIFORNIA)
ss
COUNTY OF SAN BERNARDINO)

ON SEPTEMBER 11, 2006, BEFORE ME, TRACI R. MCGINLEY, NOTARY, PERSONALLY APPEARED ROBERT HEITZMAN, PERSONALLY KNOWN TO ME (OR PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE) TO BE THE PERSON(~~S~~) WHOSE NAME(~~S~~) IS(~~ARE~~) SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/~~SHE/THEY~~ EXECUTED THE SAME IN HIS/~~HER/THEIR~~ AUTHORIZED CAPACITY(~~IES~~), AND THAT BY HIS/~~HER/THEIR~~ SIGNATURE(~~S~~) ON THE INSTRUMENT THE PERSON(~~S~~) OR THE ENTITY UPON BEHALF OF WHICH THE PERSON(~~S~~) ACTED, EXECUTED THE INSTRUMENT.

WITNESS MY HAND AND OFFICIAL SEAL

SIGNATURE _____
TRACI R. MCGINLEY

COMMISSION # 1483449
APRIL 13, 2008

NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE — MY COMMISSION EXPIRES

MY PRINCIPAL PLACE OF BUSINESS IS SAN BERNARDINO COUNTY.

ABANDONMENT NOTE

PURSUANT TO SECTION 66499.20-1/2 OF THE SUBDIVISION MAP ACT, THE FILING OF THIS MAP CONSTITUTES ABANDONMENT OF THAT CERTAIN EASEMENT FOR STREET AND HIGHWAY PURPOSES IN FAVOR OF THE CITY OF ONTARIO AS SHOWN ON TRACT MAP NO. 16666 IN BOOK 302, PAGES 55 AND 56 OF MAPS.

SIGNATURE OMISSION

THE SIGNATURE OF THE CITY OF ONTARIO, THE OWNER OF AN EASEMENT STORM DRAIN PURPOSES, DISCLOSED BY INSTRUMENT NO. 1989-210122, RECORDS OF SAN BERNARDINO COUNTY HAVE BEEN OMITTED UNDER THE PROVISIONS OF SECTION 66436 OF THE SUBDIVISION MAP ACT OF THE STATE OF CALIFORNIA. ITS INTEREST CANNOT RIPEN INTO A FEE.

SURVEYOR'S STATEMENT

I, LENNY GUYETT, HEREBY STATE THAT I AM A LICENSED LAND SURVEYOR OF THE STATE OF CALIFORNIA AND THAT THIS MAP, CONSISTING OF FOURTEEN SHEETS, IS A TRUE AND COMPLETE REPRESENTATION OF A SURVEY MADE BY ME OR UNDER MY DIRECTION IN MARCH 2005 AT THE REQUEST OF PANATTONI DEVELOPMENT, AND THAT ALL THE MONUMENTS SHOWN HEREON ARE OF THE CHARACTER AND OCCUPY THE POSITIONS INDICATED, OR WILL BE SET IN SUCH POSITIONS WITHIN ONE YEAR OF THE RECORDATION OF THIS MAP, IN COMPLIANCE WITH SECTION 66495 AND 66496 OF THE SUBDIVISION MAP ACT, AND ARE OR WILL BE SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED. I HEREBY STATE THAT THIS PARCEL MAP SUBSTANTIALLY CONFORMS TO THE APPROVED OR CONDITIONALLY APPROVED TENTATIVE MAP, IF ANY.

8/24/06
LENNY GUYETT, PLS 7993
REGISTRATION EXPIRES: 12-31-06

LICENSED LAND SURVEYOR — LENNY GUYETT — No. 7993 — Exp. 12/31/06 — STATE OF CALIFORNIA

CITY ENGINEER'S STATEMENT

I HEREBY STATE THAT I HAVE EXAMINED THIS MAP, AND THAT THE SUBDIVISION SHOWN HEREON IS SUBSTANTIALLY THE SAME AS IT APPEARED ON THE TENTATIVE MAP AND ANY APPROVED ALTERATIONS THEREOF, AND THAT ALL THE PROVISIONS OF THE SUBDIVISION MAP ACT AND THE CITY OF ONTARIO MUNICIPAL CODE HAVE BEEN COMPLIED WITH AND I AM SATISFIED THAT THIS MAP IS TECHNICALLY CORRECT.

8.30.06
JOHN P. SULLIVAN
CITY ENGINEER, R.C.E. 24079
CITY OF ONTARIO, CALIFORNIA
REGISTRATION EXPIRES: 12/31/07

REGISTERED PROFESSIONAL ENGINEER — JOHN P. SULLIVAN — No. 24079 — Exp. 12-31-07 — CIVIL — STATE OF CALIFORNIA

PLANNING COMMISSION'S STATEMENT

I DO HEREBY STATE THAT THE SUBDIVISION SHOWN ON THE ANNEXED MAP IS IN ACCORDANCE WITH THE TENTATIVE MAP APPROVED AT A MEETING OF THE PLANNING COMMISSION OF THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, HELD ON THE TWENTY-EIGHTH DAY OF FEBRUARY, 2006.

DATED: 8.29.06 BY: _____
JERRY L. BLUM
SECRETARY OF THE ONTARIO PLANNING COMMISSION

CITY COUNCIL'S STATEMENT

I HEREBY STATE THAT THE CITY COUNCIL OF THE CITY OF ONTARIO BY A MOTION, BY RESOLUTION, DULY SECONDED, PASSED AND APPROVED THE ANNEXED MAP ON THE 6TH DAY OF JUNE, 2006, AND ACCEPTED, SUBJECT TO THEIR IMPROVEMENT IN ACCORDANCE WITH CITY STANDARDS, THE FOLLOWING DEDICATIONS:
THE DEDICATION OF ONTARIO CENTER PARKWAY FOR STREET AND PUBLIC UTILITY PURPOSES AS SHOWN ON THE ANNEXED MAP;
EASEMENTS FOR EMERGENCY ACCESS, AND PUBLIC UTILITY PURPOSES IN, OVER, UNDER, AND ACROSS PRIVATE STREETS VIA ASTI, VIA PIEMONTE, VIA ALBA, VIA VILLAGIO, AND VIA TURIN AS SHOWN ON THE ANNEXED MAP;
A 10 FOOT EASEMENT FOR PEDESTRIAN ACCESS AS SHOWN ON THE ANNEXED MAP;
A 10.5 FOOT EASEMENT FOR PEDESTRIAN ACCESS AND PUBLIC UTILITY PURPOSES AS SHOWN ON THE ANNEXED MAP;
AND ALSO ACCEPTED THE ABANDONMENT OF THAT CERTAIN EASEMENT FOR STREET AND HIGHWAY PURPOSES IN FAVOR OF THE CITY OF ONTARIO AS SHOWN ON TRACT MAP NO. 16666 IN BOOK 302, PAGES 55 AND 56 OF MAPS, AND AS ALSO SHOWN ON ~~THE ANNEXED~~ THE ANNEXED MAP.

DATED: 08-31-06 BY: _____
TRACI R. MCGINLEY
CITY CLERK ASSISTANT
CITY OF ONTARIO, CALIFORNIA

CITY OF ONTARIO — INCORPORATED — DECEMBER — 1891 — CALIFORNIA

AUDITOR'S STATEMENT

I HEREBY ~~CERTIFY~~ STATE THAT ACCORDING TO THE RECORDS OF THIS OFFICE, AS OF THIS DATE, THERE ARE NO LIENS AGAINST THE REAL PROPERTY SHOWN UPON THE ANNEXED MAP FOR UNPAID STATE, COUNTY, MUNICIPAL OR LOCAL TAXES, OR SPECIAL ASSESSMENTS COLLECTED AS TAXES, EXCEPT TAXES OR SPECIAL ASSESSMENTS NOT YET PAYABLE, ESTIMATED TO BE $ 0 (EXEMPT).

LARRY WALKER, COUNTY AUDITOR/CONTROLLER
COUNTY OF SAN BERNARDINO

09/15/06 BY: _____
DATED: DEPUTY

BOARD OF SUPERVISOR'S STATEMENT

I HEREBY ~~CERTIFY~~ STATE THAT A BOND IN THE SUM OF $ 0 HAS BEEN EXECUTED AND FILED WITH THE BOARD OF SUPERVISORS ~~(OR AGENCY)~~ OF THE COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, CONDITIONED UPON THE PAYMENT OF ALL TAXES, STATE, COUNTY, MUNICIPAL, OR LOCAL, AND ALL SPECIAL ASSESSMENTS, COLLECTED AS TAXES, WHICH AT THE TIME OF FILING OF THE ANNEXED MAP WITH THE COUNTY RECORDER IS A LIEN AGAINST SAID PROPERTY, BUT NOT YET PAYABLE AND THAT THE SUBDIVIDER HAS FILED WITH ME A CERTIFICATE BY THE PROPER OFFICER GIVING HIS ESTIMATE OF THE AMOUNT OF SAID TAXES AND ASSESSMENTS, AND SAID BOND I HEREBY ACCEPTED.

SPECIAL
DENA M. SMITH
CLERK OF THE BOARD OF SUPERVISOR'S OF
THE COUNTY OF SAN BERNARDINO

09/15/06 BY: _____
DATED: DEPUTY

COUNTY RECORDER'S CERTIFICATE

THIS MAP HAS BEEN FILED UNDER DOCUMENT NUMBER 2006-0632192
THIS 15TH DAY OF SEPTEMBER 2006, AT 9:52 A.M. IN BOOK 210 OF PAGE 7-20
AT THE REQUEST OF FIRST AMERICAN TITLE,
IN THE AMOUNT OF $ 0.00
9:52AM
OF PARCEL MAPS

LARRY WALKER, COUNTY AUDITOR
THE COUNTY OF SAN BERNARDINO

9/15/06 BY: _____
DATED: DEPUTY

Order: Non-Order Search Doc: SB:P 216-7 — Page 1 of 14 — Created By: Scott Shelby Printed: 5/16/2013 10:12:02 AM PST

8/012

April 2022

SHEET 2 OF 14 SHEETS

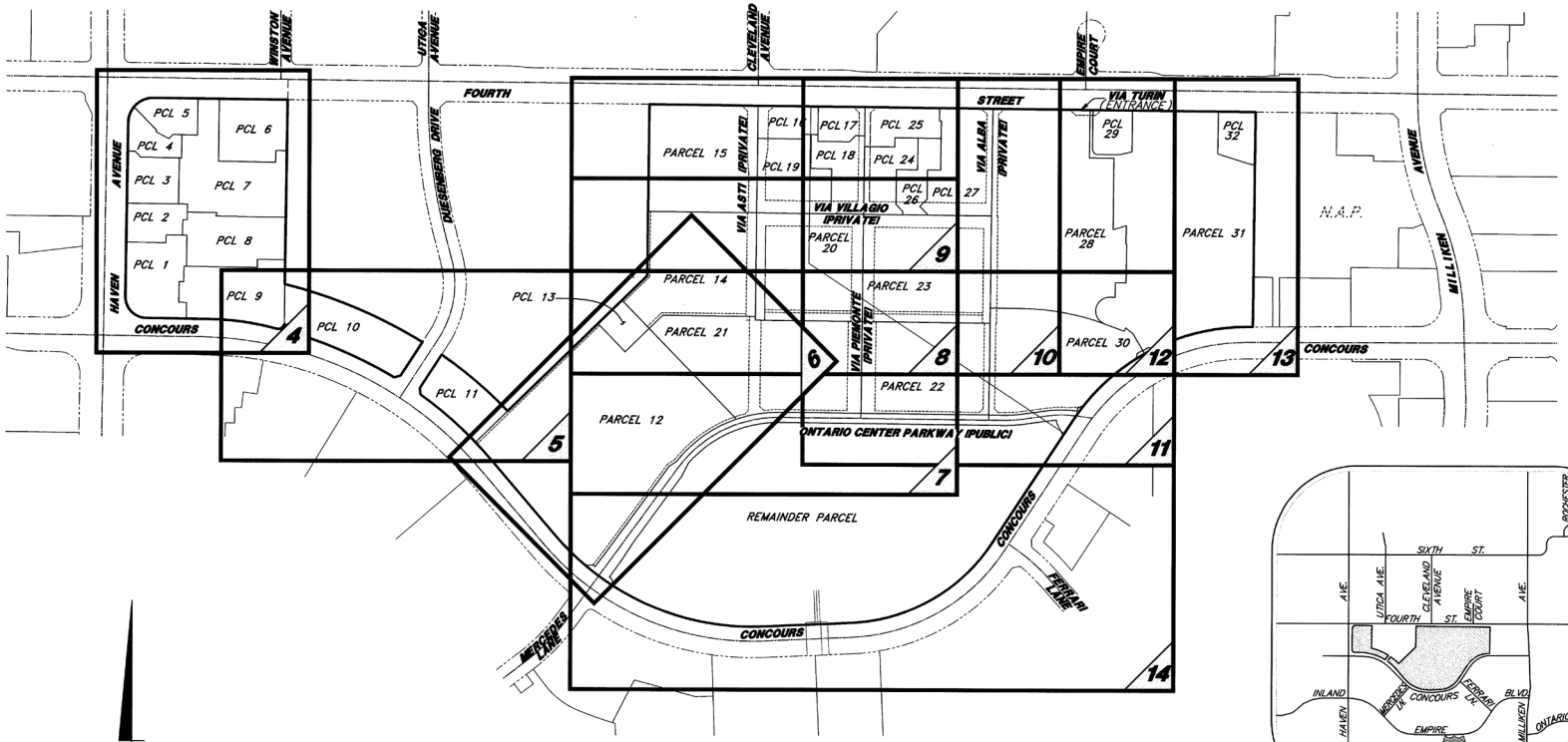
NO. OF PARCELS: 32
1 REMAINDER PARCEL
GROSS ACREAGE = 119.83
NET ACREAGE = 117.36

PARCEL MAP NO. 17550

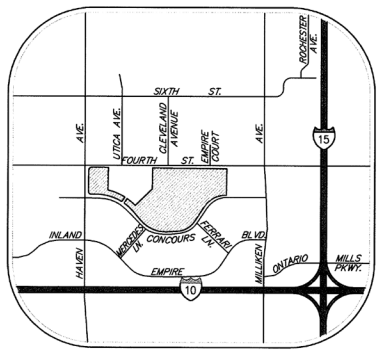
IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO,
STATE OF CALIFORNIA

BEING A SUBDIVISION OF ALL OF PARCEL 2 OF PARCEL MAP NO. 16056, AS PER MAP FILED IN BOOK 199, PAGES 96 AND 97 OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, AND ALL OF LOTS 1, 4, 5, AND ALL OF THE REMAINDER OF TRACT MAP NO. 16666, AS PER MAP FILED IN BOOK 302, PAGES 55 AND 56 OF MAPS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

LENNY GUYETT P.L.S. 7993
FEBRUARY 15, 2006



INDEX MAP



VICINITY MAP:
NOT TO SCALE

GRAPHIC SCALE

300 0 150 300 600 1200

(IN FEET)
1 inch = 300 ft.

216/8

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6/918

April 2022

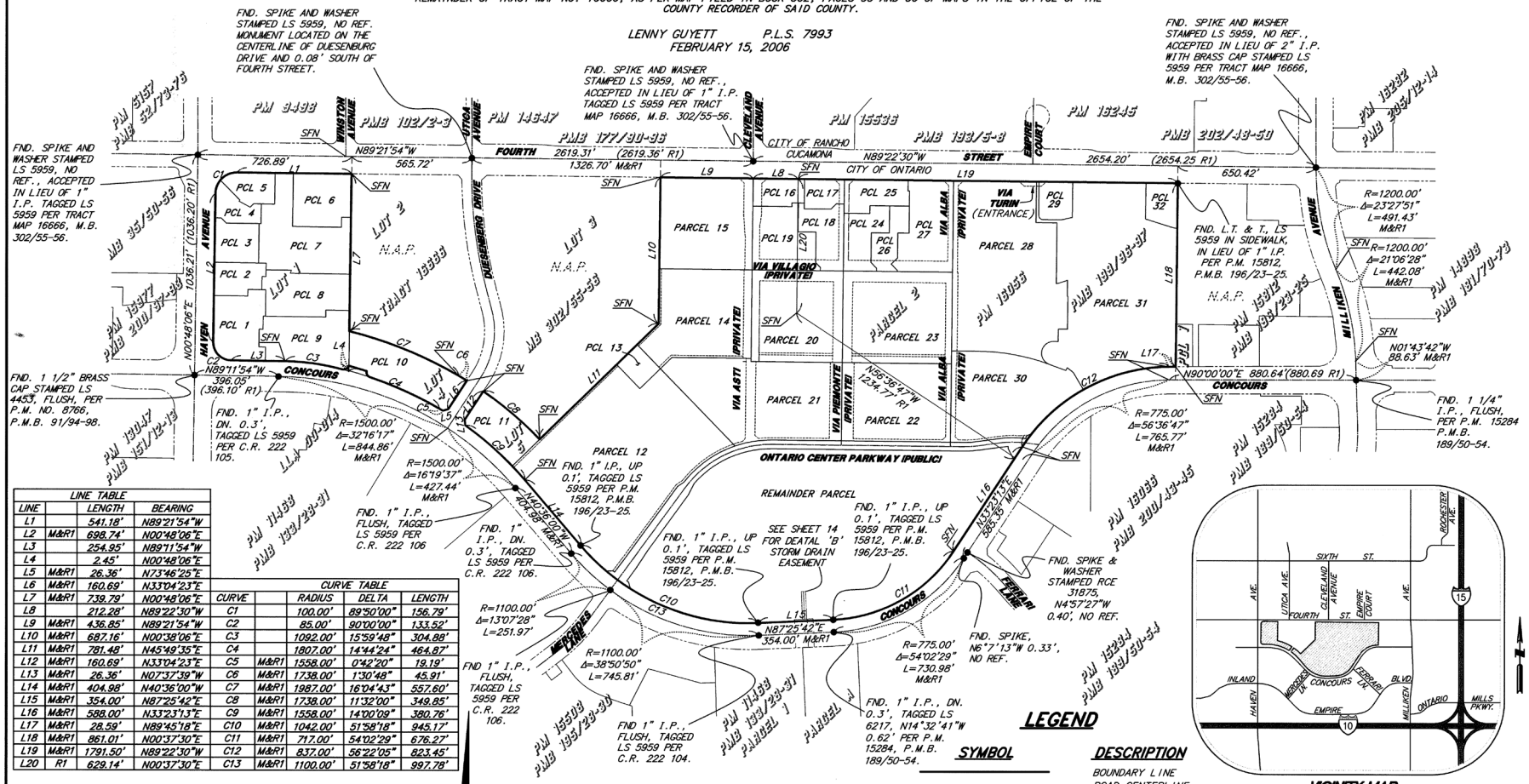
NO. OF PARCELS: 32
1 REMAINDER PARCEL
GROSS ACREAGE = 119.83
NET ACREAGE = 117.36

PARCEL MAP NO. 17550

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO,
STATE OF CALIFORNIA

BEING A SUBDIVISION OF ALL OF PARCEL 2 OF PARCEL MAP NO. 16056, AS PER MAP FILED IN BOOK 199, PAGES 96 AND 97 OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, AND ALL OF LOTS 1, 4, 5, AND ALL OF THE REMAINDER OF TRACT MAP NO. 16666, AS PER MAP FILED IN BOOK 302, PAGES 55 AND 56 OF MAPS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

LENNY GUYETT P.L.S. 7993
FEBRUARY 15, 2006



LINE TABLE			
LINE		LENGTH	BEARING
L1		541.18'	N89°21'54"W
L2	M&R1	698.74'	N00°48'06"E
L3		254.95'	N89°11'54"W
L4		2.45'	N00°48'06"E
L5	M&R1	26.36'	N73°46'25"E
L6	M&R1	160.69'	N33°04'23"E
L7	M&R1	739.79'	N00°48'06"E
L8		212.28'	N89°22'30"W
L9	M&R1	436.85'	N89°21'54"W
L10	M&R1	687.16'	N00°38'06"E
L11	M&R1	781.48'	N45°49'35"E
L12	M&R1	160.69'	N33°04'23"E
L13	M&R1	26.36'	N07°37'39"W
L14	M&R1	404.98'	N40°36'00"W
L15	M&R1	354.00'	N87°25'42"E
L16	M&R1	588.00'	N33°23'13"E
L17	M&R1	28.59'	N89°45'18"E
L18	M&R1	861.01'	N00°37'30"E
L19	M&R1	1791.50'	N89°22'30"W
L20	R1	629.14'	N00°37'30"E

CURVE TABLE				
CURVE		RADIUS	DELTA	LENGTH
C1		100.00'	89°50'00"	156.79'
C2		85.00'	90°00'00"	133.52'
C3		1092.00'	15°59'48"	304.88'
C4		1807.00'	14°44'24"	464.87'
C5	M&R1	1558.00'	0°42'20"	19.19'
C6	M&R1	1738.00'	1°30'48"	45.91'
C7	M&R1	1987.00'	16°04'43"	557.60'
C8	M&R1	1738.00'	11°32'00"	349.85'
C9	M&R1	1558.00'	14°00'09"	380.76'
C10	M&R1	1042.00'	51°58'18"	945.17'
C11	M&R1	717.00'	54°02'29"	676.27'
C12	M&R1	837.00'	56°22'05"	823.45'
C13	M&R1	1100.00'	51°58'18"	997.78'

GRAPHIC SCALE
300 0 150 300 600 1200
(IN FEET)
1 inch = 300 ft.

BASIS OF BEARINGS

BEARINGS ARE BASED UPON THE CENTERLINE OF HAVEN AVENUE AS BEING N00°48'06"E PER TRACT MAP 16666, RECORDED IN MB 302, PAGES 55 AND 56, SAN BERNARDIO COUNTY RECORDS.

LEGEND

SYMBOL	DESCRIPTION
	BOUNDARY LINE
	ROAD CENTERLINE
	RIGHT-OF-WAY
	PROPOSED EASEMENT
R1	INDICATES RECORD DATA PER TRACT MAP NO. 16666, M.B. 302/55-56
M	INDICATES MEASURED DISTANCE
SFN	INDICATES SEARCH FOUND NOTHING.
●	INDICATES FOUND MONUMENT AS NOTED. ALL FOUND MONUMENTS LOCATED WITHIN 0.02'+/- OF RECORD POSITION HAVE BEEN ACCEPTED AS RECORD POSITION HEREON.
○	INDICATES 1" I.P. & TAG OR NAIL & TAG "LS 7993" TO BE SET.
⊙	INDICATES 2" I.P. & TAG OR NAIL & TAG "LS 7993" TO BE SET.

VICINITY MAP:
NOT TO SCALE

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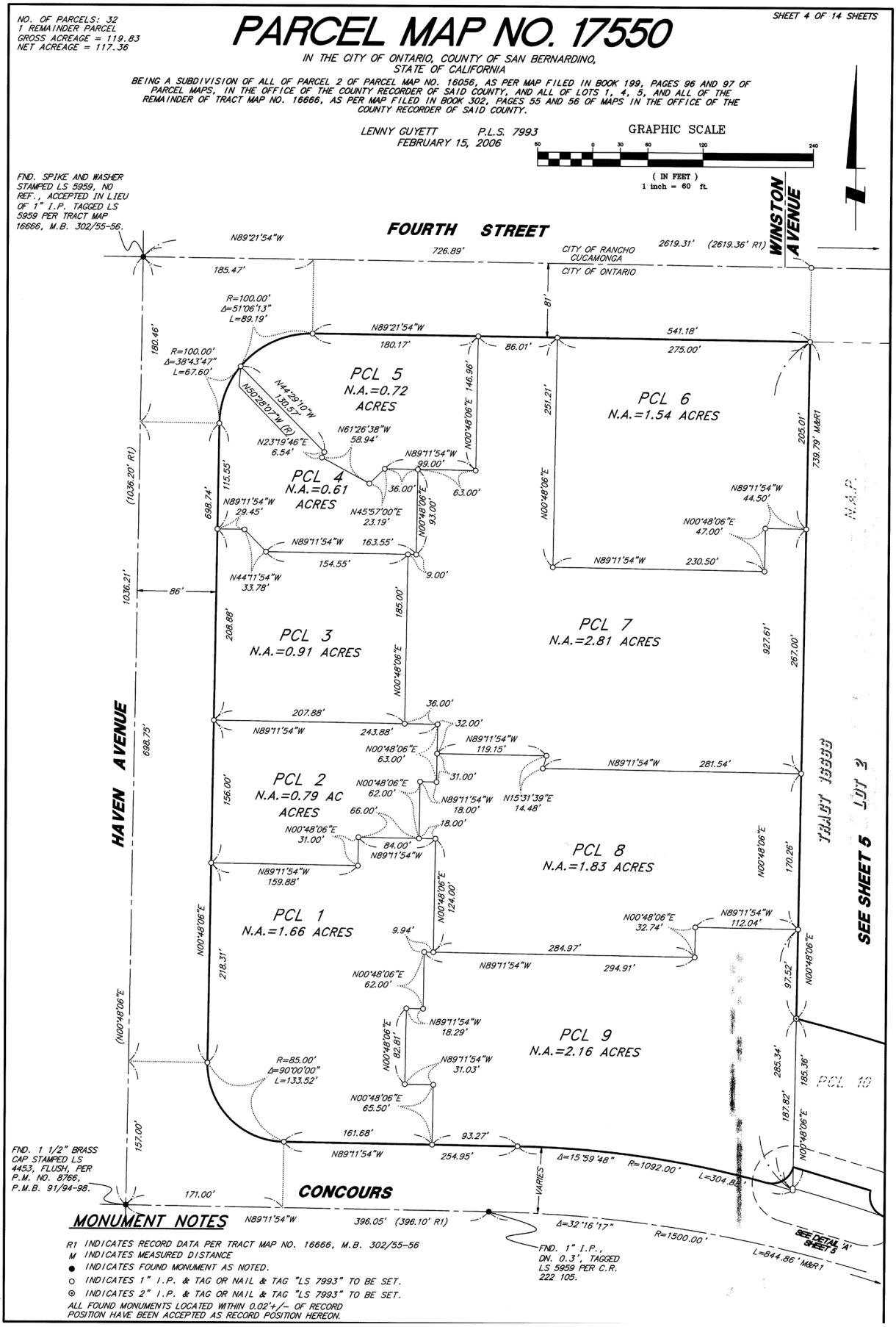

NO. OF PARCELS: 32
1 REMAINDER PARCEL
GROSS ACREAGE = 119.83
NET ACREAGE = 117.36
PARCEL MAP NO. 17550
SHEET 4 OF 14 SHEETS
IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA
BEING A SUBDIVISION OF ALL OF PARCEL 2 OF PARCEL MAP NO. 16056, AS PER MAP FILED IN BOOK 199, PAGES 96 AND 97 OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, AND ALL OF LOTS 1, 4, 5, AND ALL OF THE REMAINDER OF TRACT MAP NO. 16666, AS PER MAP FILED IN BOOK 302, PAGES 55 AND 56 OF MAPS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.
LENNY GUYETT P.L.S. 7993
FEBRUARY 15, 2006
GRAPHIC SCALE
(IN FEET)
1 inch = 60 ft.
FND. SPIKE AND WASHER STAMPED LS 5959, NO REF., ACCEPTED IN LIEU OF 1" I.P. TAGGED LS 5959 PER TRACT MAP 16666, M.B. 302/55-56.
FOURTH STREET
WINSTON AVENUE
CITY OF RANCHO CUCAMONGA
CITY OF ONTARIO
HAVEN AVENUE
CONCOURS
PCL 1 N.A.=1.66 ACRES
PCL 2 N.A.=0.79 AC ACRES
PCL 3 N.A.=0.91 ACRES
PCL 4 N.A.=0.61 ACRES
PCL 5 N.A.=0.72 ACRES
PCL 6 N.A.=1.54 ACRES
PCL 7 N.A.=2.81 ACRES
PCL 8 N.A.=1.83 ACRES
PCL 9 N.A.=2.16 ACRES
PCL 10
SEE SHEET 5
SEE DETAIL 'A' SHEET 5
FND. 1 1/2" BRASS CAP STAMPED LS 4453, FLUSH, PER P.M. NO. 8766, P.M.B. 91/94-98.
FND. 1" I.P., DN. 0.3', TAGGED LS 5959 PER C.R. 222 105.
MONUMENT NOTES
R1 INDICATES RECORD DATA PER TRACT MAP NO. 16666, M.B. 302/55-56
M INDICATES MEASURED DISTANCE
● INDICATES FOUND MONUMENT AS NOTED.
○ INDICATES 1" I.P. & TAG OR NAIL & TAG "LS 7993" TO BE SET.
⊙ INDICATES 2" I.P. & TAG OR NAIL & TAG "LS 7993" TO BE SET.
ALL FOUND MONUMENTS LOCATED WITHIN 0.02'+/- OF RECORD POSITION HAVE BEEN ACCEPTED AS RECORD POSITION HEREON.

11/918

April 2022

NO. OF PARCELS: 32
1 REMAINDER PARCEL
GROSS ACREAGE = 119.83
NET ACREAGE = 117.36

SHEET 5 OF 14 SHEETS

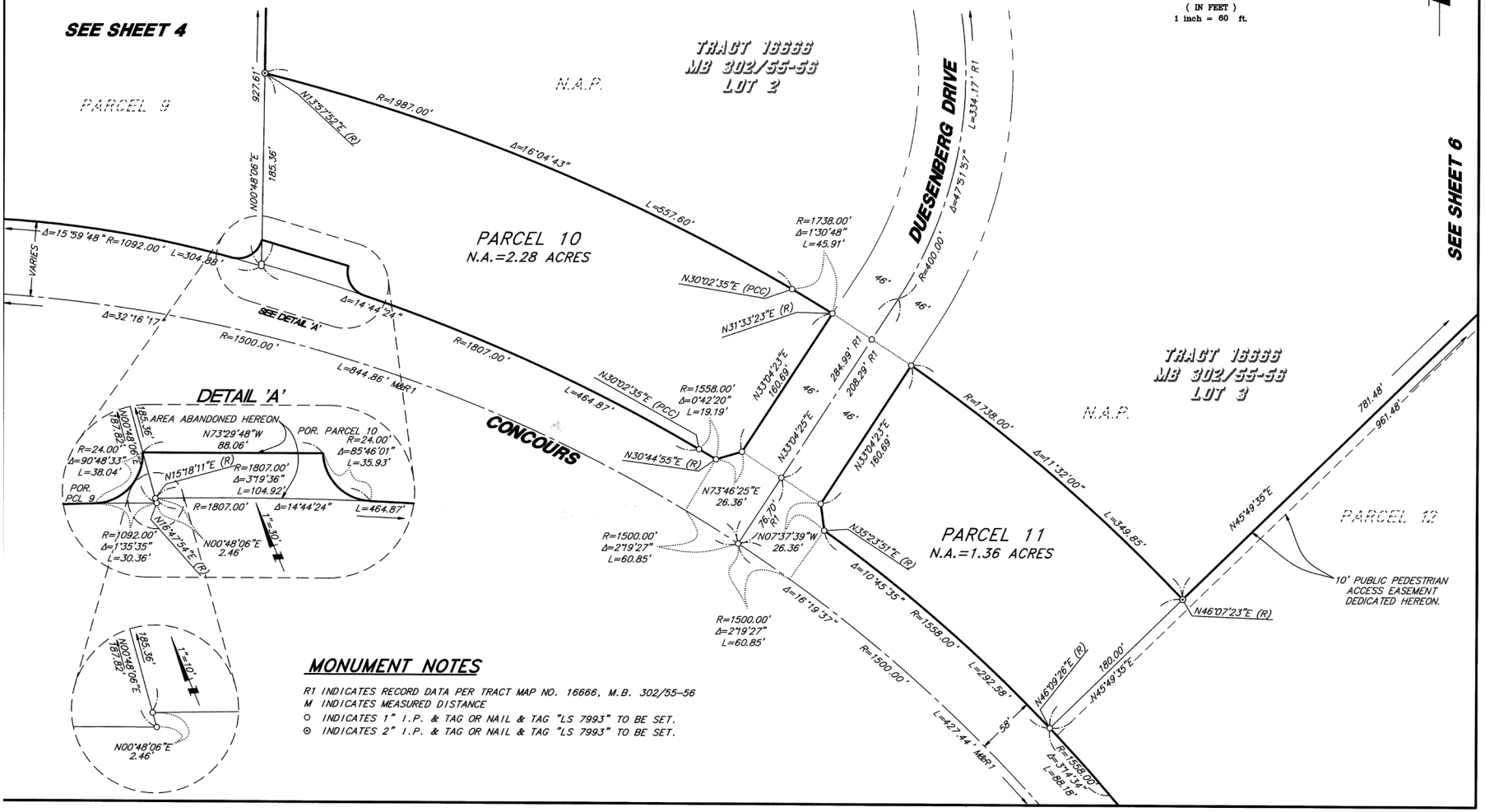
PARCEL MAP NO. 17550

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO,
STATE OF CALIFORNIA

BEING A SUBDIVISION OF ALL OF PARCEL 2 OF PARCEL MAP NO. 16056, AS PER MAP FILED IN BOOK 199, PAGES 96 AND 97 OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, AND ALL OF LOTS 1, 4, 5, AND ALL OF THE REMAINDER OF TRACT MAP NO. 16666, AS PER MAP FILED IN BOOK 302, PAGES 55 AND 56 OF MAPS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

LENNY GUYETT P.L.S. 7993
FEBRUARY 15, 2006

GRAPHIC SCALE
60 0 30 60 120 240
(IN FEET)
1 inch = 60 ft.



MONUMENT NOTES

R1 INDICATES RECORD DATA PER TRACT MAP NO. 16666, M.B. 302/55-56
M INDICATES MEASURED DISTANCE
○ INDICATES 1" I.P. & TAG OR NAIL & TAG "LS 7993" TO BE SET.
⊙ INDICATES 2" I.P. & TAG OR NAIL & TAG "LS 7993" TO BE SET.

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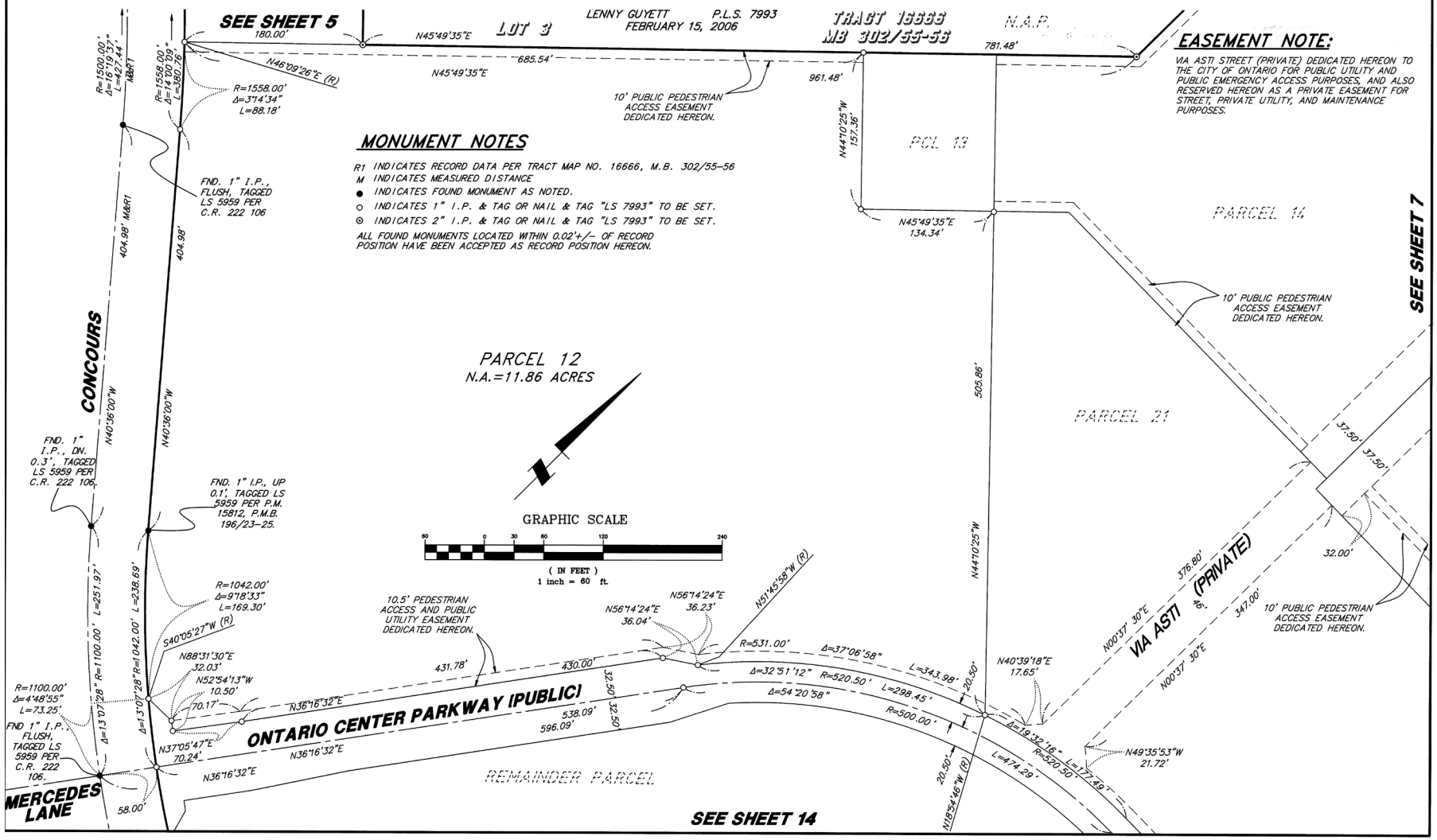
PARCEL MAP NO. 17550

SHEET 6 OF 14 SHEETS

NO. OF PARCELS: 32
1 REMAINDER PARCEL
GROSS ACREAGE = 119.83
NET ACREAGE = 117.36

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO,
STATE OF CALIFORNIA

BEING A SUBDIVISION OF ALL OF PARCEL 2 OF PARCEL MAP NO. 16056, AS PER MAP FILED IN BOOK 199, PAGES 96 AND 97 OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, AND ALL OF LOTS 1, 4, 5, AND ALL OF THE REMAINDER OF TRACT MAP NO. 16666, AS PER MAP FILED IN BOOK 302, PAGES 55 AND 56 OF MAPS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.



2/6/12

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SHEET 7 OF 14 SHEETS

NO. OF PARCELS: 32
1 REMAINDER PARCEL
GROSS ACREAGE = 119.83
NET ACREAGE = 117.36

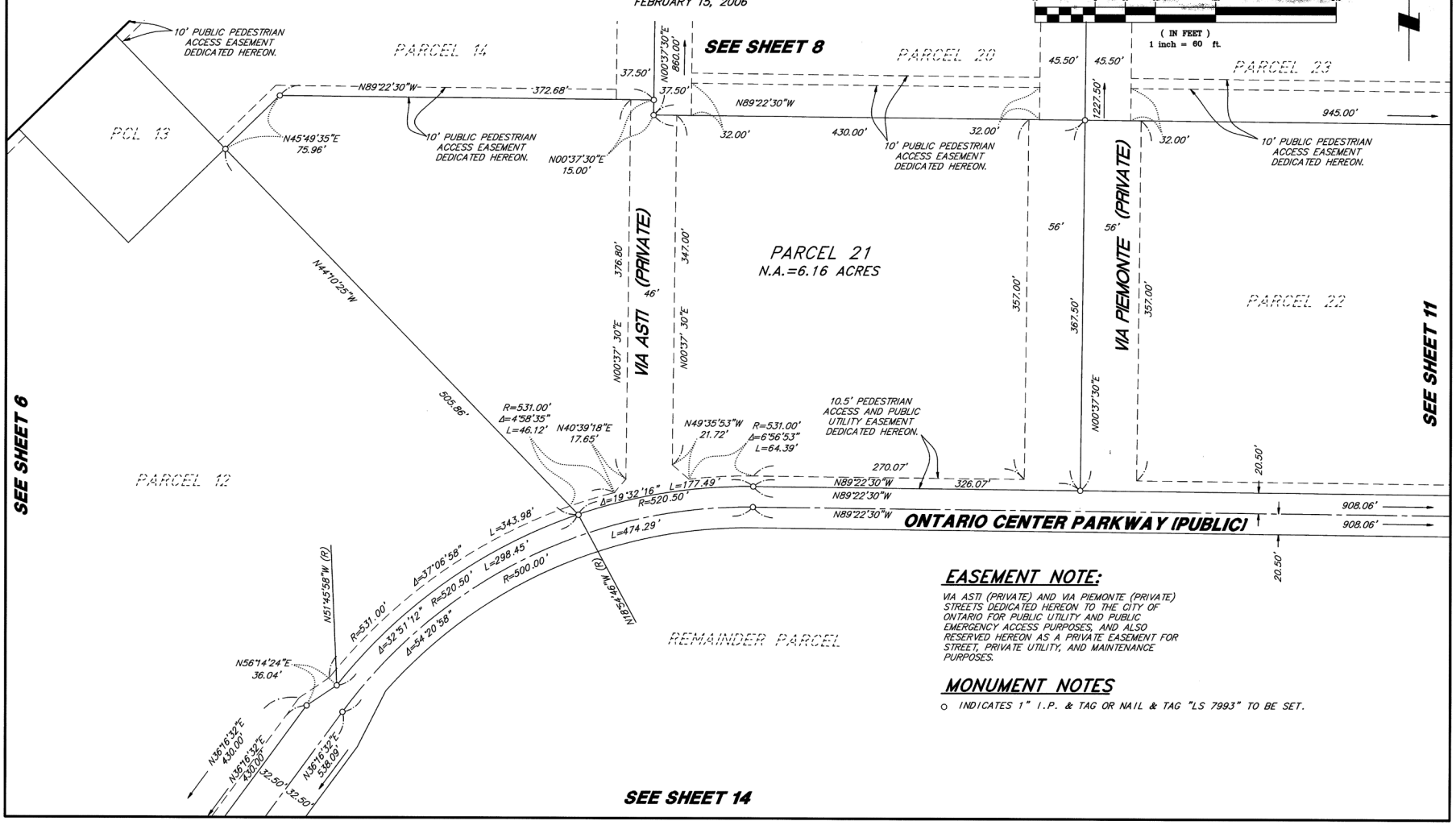
PARCEL MAP NO. 17550

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO,
STATE OF CALIFORNIA

BEING A SUBDIVISION OF ALL OF PARCEL 2 OF PARCEL MAP NO. 16056, AS PER MAP FILED IN BOOK 199, PAGES 96 AND 97 OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, AND ALL OF LOTS 1, 4, 5, AND ALL OF THE REMAINDER OF TRACT MAP NO. 16666, AS PER MAP FILED IN BOOK 302, PAGES 55 AND 56 OF MAPS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

LENNY GUYETT P.L.S. 7993
FEBRUARY 15, 2006

GRAPHIC SCALE
60 0 30 60 120 240
(IN FEET)
1 inch = 60 ft.



EASEMENT NOTE:

VIA ASTI (PRIVATE) AND VIA PIEMONTE (PRIVATE) STREETS DEDICATED HEREON TO THE CITY OF ONTARIO FOR PUBLIC UTILITY AND PUBLIC EMERGENCY ACCESS PURPOSES, AND ALSO RESERVED HEREON AS A PRIVATE EASEMENT FOR STREET, PRIVATE UTILITY, AND MAINTENANCE PURPOSES.

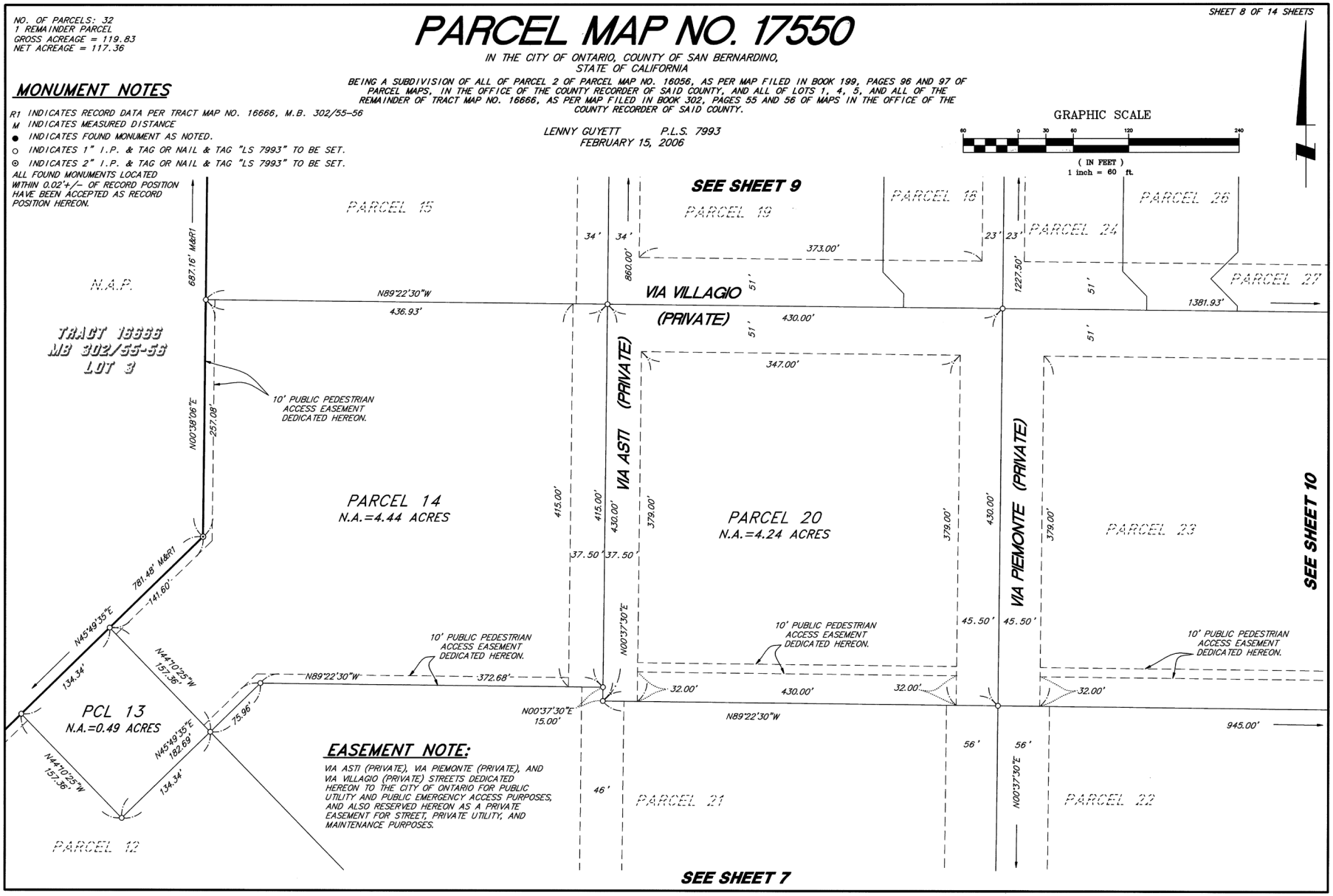
MONUMENT NOTES

○ INDICATES 1" I.P. & TAG OR NAIL & TAG "LS 7993" TO BE SET.

SEE SHEET 14

h1/91e

April 2022



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S1/01E

NO. OF PARCELS: 32
1 REMAINDER PARCEL
GROSS ACREAGE = 119.83
NET ACREAGE = 117.36

PARCEL MAP NO. 17550

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO,
STATE OF CALIFORNIA

BEING A SUBDIVISION OF ALL OF PARCEL 2 OF PARCEL MAP NO. 18056, AS PER MAP FILED IN BOOK 199, PAGES 96 AND 97 OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, AND ALL OF LOTS 1, 4, 5, AND ALL OF THE REMAINDER OF TRACT MAP NO. 16666, AS PER MAP FILED IN BOOK 302, PAGES 55 AND 56 OF MAPS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

LENNY GUYETT P.L.S. 7993
FEBRUARY 15, 2006

GRAPHIC SCALE
60 0 30 60 120 240
(IN FEET)
1 inch = 60 ft.

MONUMENT NOTES

R1 INDICATES RECORD DATA PER TRACT MAP NO. 16666, M.B. 302/55-56
○ INDICATES 1" I.P. & TAG OR NAIL & TAG "LS 7993" TO BE SET.
● INDICATES FOUND MONUMENT AS NOTED.
ALL FOUND MONUMENTS LOCATED WITHIN 0.02'+/- OF RECORD POSITION HAVE BEEN ACCEPTED AS RECORD POSITION HEREON.

FND. SPIKE AND WASHER STAMPED LS 5959, NO REF ACCEPTED IN LIEU OF 1"I.P. TAGGED LS 5959 PER TRACT MAP 16666, M.B. 302/55-56

CLEVELAND AVENUE (PRIVATE)

FOURTH STREET

CITY OF RANCHO CUCAMONGA
CITY OF ONTARIO

PARCEL 15
N.A.=4.31 ACRES

PARCEL 16
N.A.=0.70 ACRES

PARCEL 17
N.A.=0.58 ACRES

PARCEL 18
N.A.=1.11 ACRES

PARCEL 19
N.A.=1.85 ACRES

PARCEL 20

PARCEL 14

PARCEL 23

PARCEL 24

PARCEL 25

PARCEL 26

N.A.P.

TRACT 16666
MB 302/55-56
LOT 3

VIA ASTI (PRIVATE)

VIA VILLAGIO (PRIVATE)

VIA PIEMONTE (PRIVATE)

SEE SHEET 10

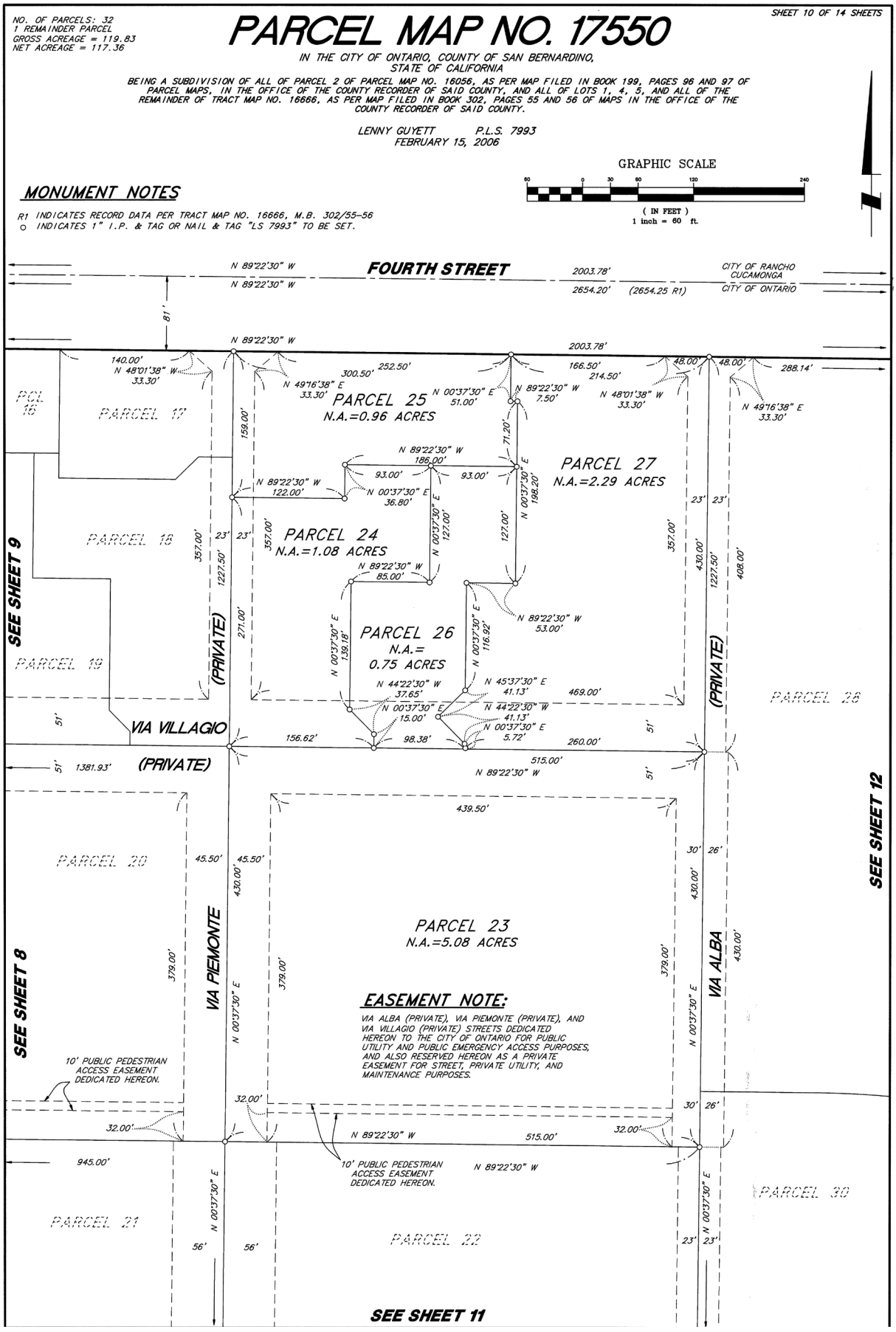
SEE SHEET 8

EASEMENT NOTE:

VIA ASTI (PRIVATE), VIA VILLAGIO (PRIVATE), AND VIA PIEMONTE (PRIVATE) STREETS DEDICATED HEREON TO THE CITY OF ONTARIO FOR PUBLIC UTILITY AND PUBLIC EMERGENCY ACCESS PURPOSES, AND ALSO RESERVED HEREON AS A PRIVATE EASEMENT FOR STREET, PRIVATE UTILITY, AND MAINTENANCE PURPOSES.

10' PUBLIC PEDESTRIAN ACCESS EASEMENT DEDICATED HEREON.

216/15


NO. OF PARCELS: 32
1 REMAINDER PARCEL
GROSS ACREAGE = 119.83
NET ACREAGE = 117.36
SHEET 10 OF 14 SHEETS
PARCEL MAP NO. 17550
IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA
BEING A SUBDIVISION OF ALL OF PARCEL 2 OF PARCEL MAP NO. 16056, AS PER MAP FILED IN BOOK 199, PAGES 96 AND 97 OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, AND ALL OF LOTS 1, 4, 5, AND ALL OF THE REMAINDER OF TRACT MAP NO. 16666, AS PER MAP FILED IN BOOK 302, PAGES 55 AND 56 OF MAPS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.
LENNY GUYETT P.L.S. 7993
FEBRUARY 15, 2006
GRAPHIC SCALE
(IN FEET)
1 inch = 60 ft.
MONUMENT NOTES
R1 INDICATES RECORD DATA PER TRACT MAP NO. 16666, M.B. 302/55-56
○ INDICATES 1" I.P. & TAG OR NAIL & TAG "LS 7993" TO BE SET.
FOURTH STREET
CITY OF RANCHO CUCAMONGA
CITY OF ONTARIO
PARCEL 25
N.A.=0.96 ACRES
PARCEL 27
N.A.=2.29 ACRES
PARCEL 24
N.A.=1.08 ACRES
PARCEL 26
N.A.=
0.75 ACRES
PARCEL 23
N.A.=5.08 ACRES
PARCEL 17
PARCEL 18
PARCEL 19
PARCEL 20
PARCEL 21
PARCEL 22
PARCEL 28
PARCEL 30
PCL 16
VIA VILLAGIO (PRIVATE)
VIA PIEMONTE (PRIVATE)
VIA ALBA (PRIVATE)
SEE SHEET 8
SEE SHEET 9
SEE SHEET 11
SEE SHEET 12
EASEMENT NOTE:
VIA ALBA (PRIVATE), VIA PIEMONTE (PRIVATE), AND VIA VILLAGIO (PRIVATE) STREETS DEDICATED HEREON TO THE CITY OF ONTARIO FOR PUBLIC UTILITY AND PUBLIC EMERGENCY ACCESS PURPOSES, AND ALSO RESERVED HEREON AS A PRIVATE EASEMENT FOR STREET, PRIVATE UTILITY, AND MAINTENANCE PURPOSES.
10' PUBLIC PEDESTRIAN ACCESS EASEMENT DEDICATED HEREON.
10' PUBLIC PEDESTRIAN ACCESS EASEMENT DEDICATED HEREON.

LI/DNE

April 2022

PARCEL MAP NO. 17550

NO. OF PARCELS: 32
1 REMAINDER PARCEL
GROSS ACREAGE = 119.83
NET ACREAGE = 117.36

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA

BEING A SUBDIVISION OF ALL OF PARCEL 2 OF PARCEL MAP NO. 16056, AS PER MAP FILED IN BOOK 199, PAGES 96 AND 97 OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, AND ALL OF LOTS 1, 4, 5, AND ALL OF THE REMAINDER OF TRACT MAP NO. 16666, AS PER MAP FILED IN BOOK 302, PAGES 55 AND 56 OF MAPS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

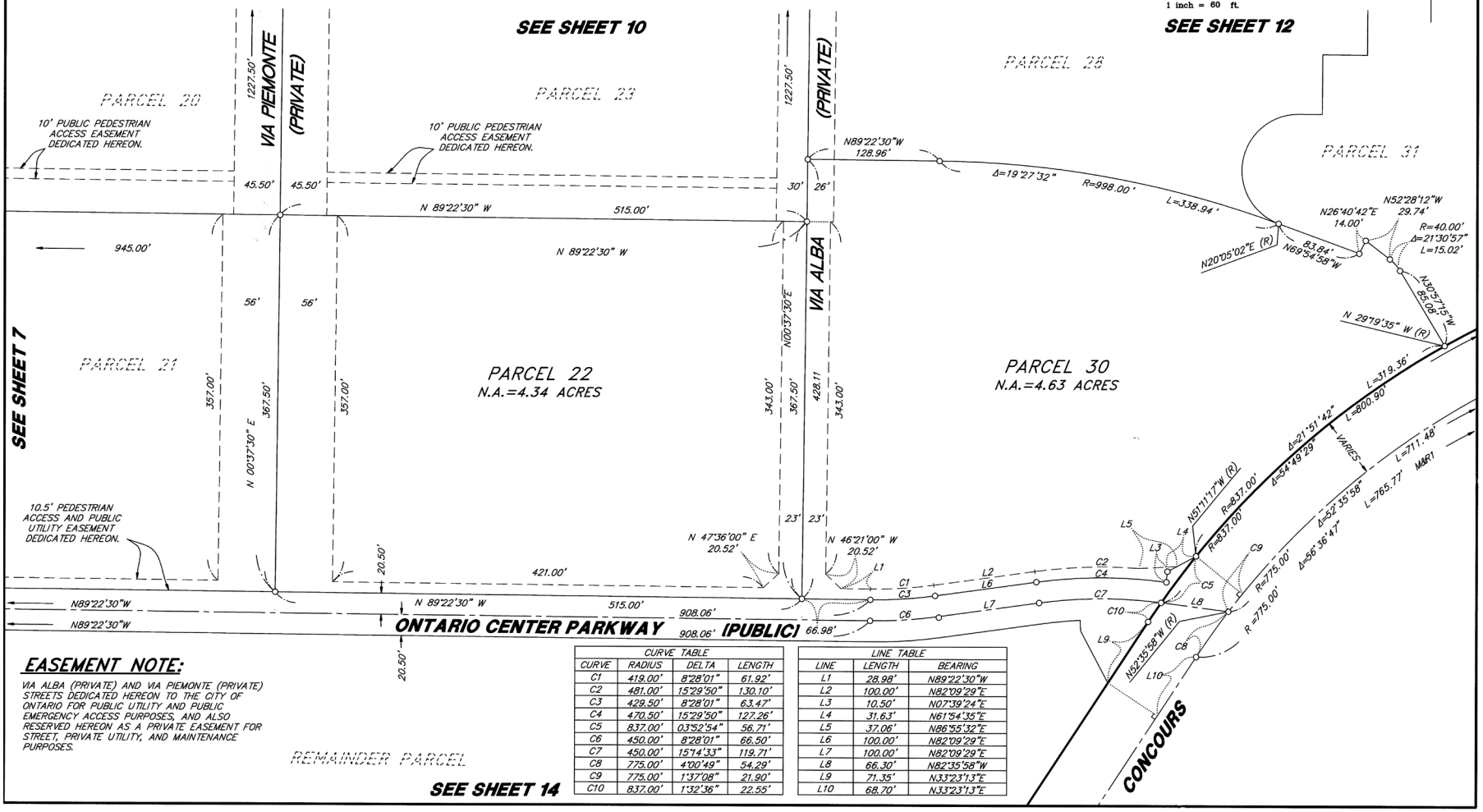
LENNY GUYETT P.L.S. 7993
FEBRUARY 15, 2006

SHEET 11 OF 14 SHEETS

GRAPHIC SCALE
60 0 30 60 120 240
(IN FEET)
1 inch = 60 ft.

MONUMENT NOTES

R1 INDICATES RECORD DATA PER TRACT MAP NO. 16666, M.B. 302/55-56
M INDICATES MEASURED DISTANCE
○ INDICATES 1" I.P. & TAG OR NAIL & TAG "LS 7993" TO BE SET.



EASEMENT NOTE:

VIA ALBA (PRIVATE) AND VIA PIEMONTE (PRIVATE) STREETS DEDICATED HEREON TO THE CITY OF ONTARIO FOR PUBLIC UTILITY AND PUBLIC EMERGENCY ACCESS PURPOSES, AND ALSO RESERVED HEREON AS A PRIVATE EASEMENT FOR STREET, PRIVATE UTILITY, AND MAINTENANCE PURPOSES.

CURVE TABLE			
CURVE	RADIUS	DELTA	LENGTH
C1	419.00'	8°28'01"	61.92'
C2	481.00'	15°29'50"	130.10'
C3	429.50'	8°28'01"	63.47'
C4	470.50'	15°29'50"	127.26'
C5	837.00'	03°52'54"	56.71'
C6	450.00'	8°28'01"	66.50'
C7	450.00'	15°14'33"	119.71'
C8	775.00'	4°00'49"	54.29'
C9	775.00'	1°37'08"	21.90'
C10	837.00'	1°32'36"	22.55'

LINE TABLE		
LINE	LENGTH	BEARING
L1	28.98'	N89°22'30"W
L2	100.00'	N82°09'29"E
L3	10.50'	N07°39'24"E
L4	31.63'	N61°54'35"E
L5	37.06'	N86°55'32"E
L6	100.00'	N82°09'29"E
L7	100.00'	N82°09'29"E
L8	66.30'	N82°35'58"W
L9	71.35'	N33°23'13"E
L10	68.70'	N33°23'13"E

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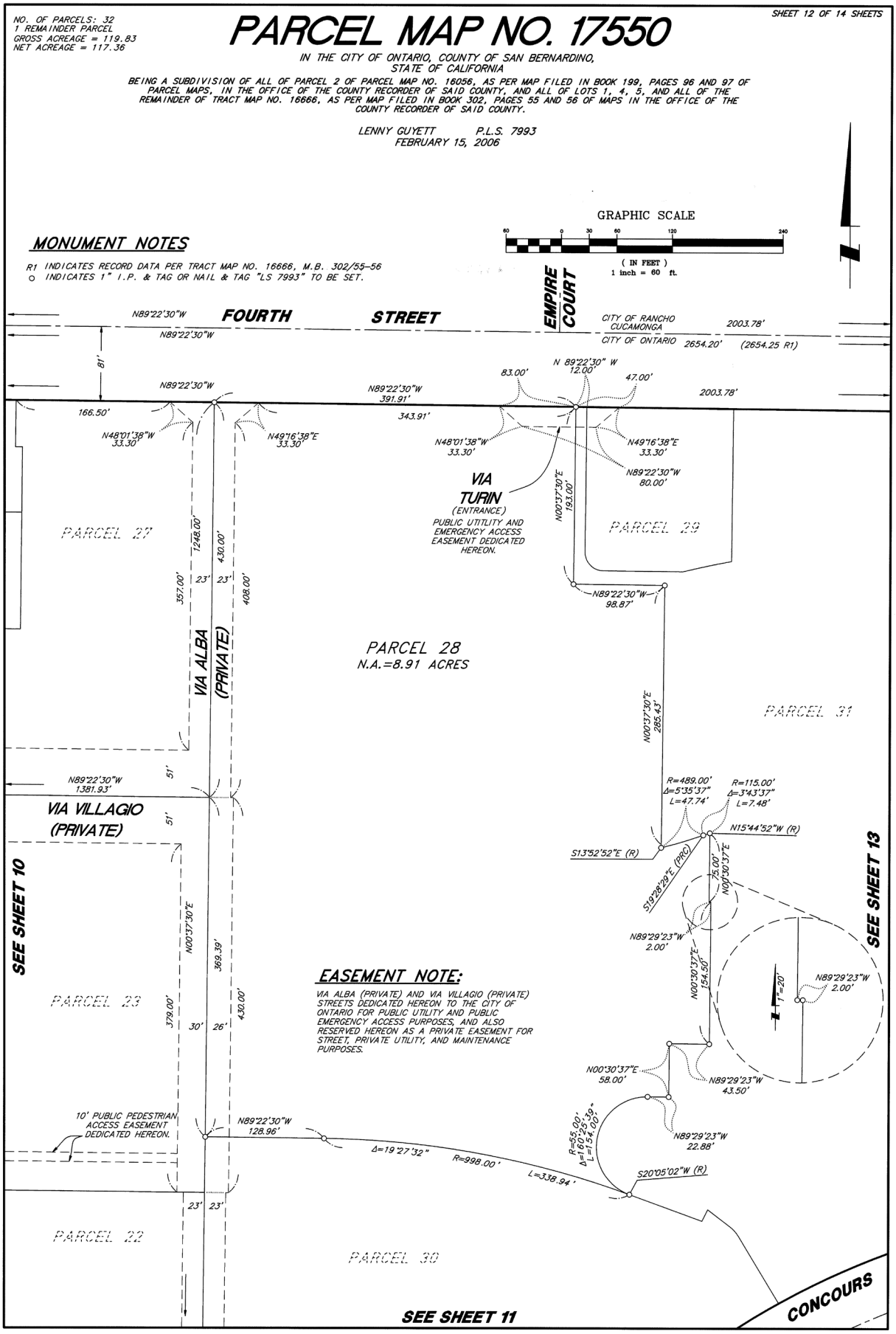
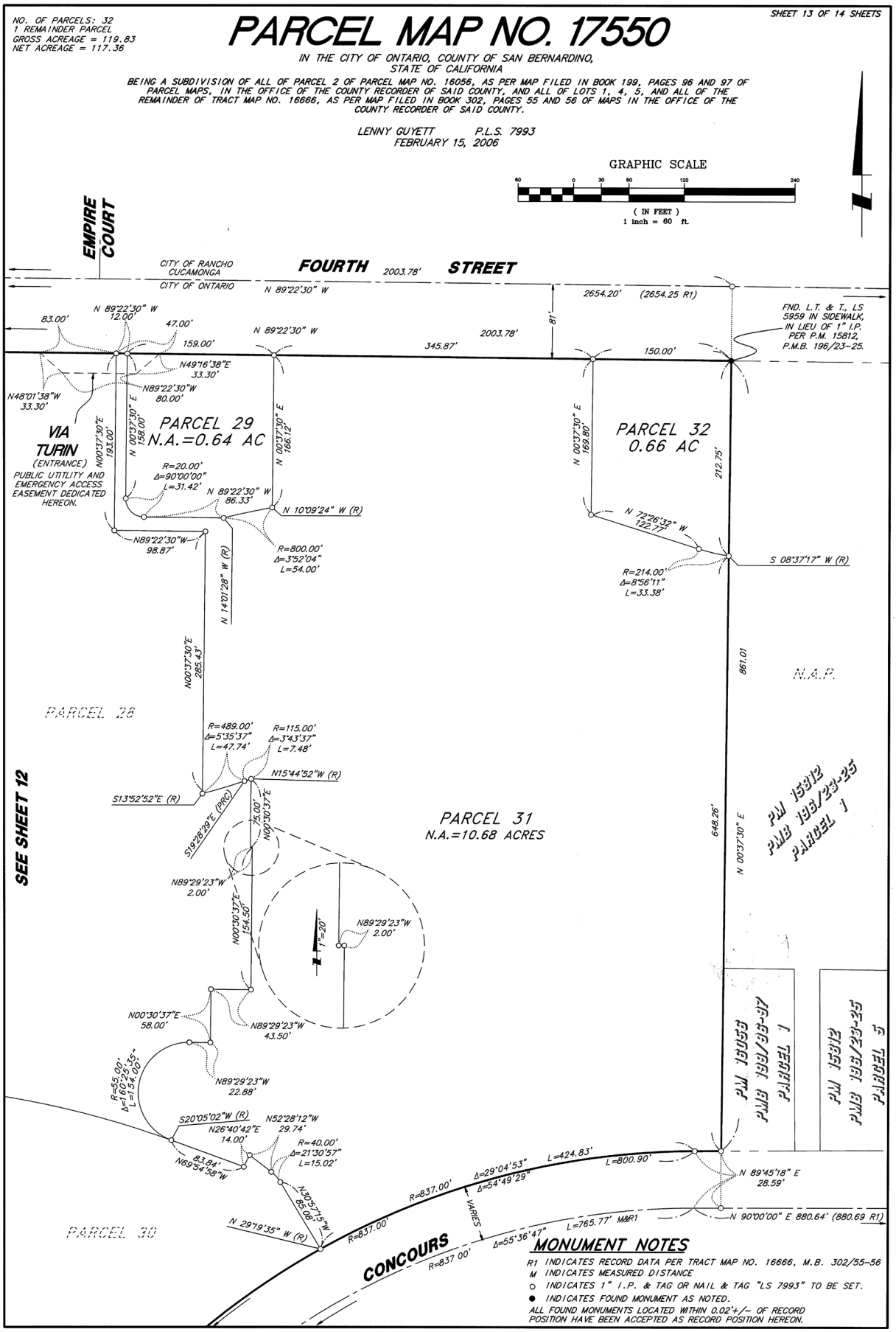

NO. OF PARCELS: 32
1 REMAINDER PARCEL
GROSS ACREAGE = 119.83
NET ACREAGE = 117.36
PARCEL MAP NO. 17550
SHEET 12 OF 14 SHEETS
IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA
BEING A SUBDIVISION OF ALL OF PARCEL 2 OF PARCEL MAP NO. 16056, AS PER MAP FILED IN BOOK 199, PAGES 96 AND 97 OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, AND ALL OF LOTS 1, 4, 5, AND ALL OF THE REMAINDER OF TRACT MAP NO. 16666, AS PER MAP FILED IN BOOK 302, PAGES 55 AND 56 OF MAPS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.
LENNY GUYETT P.L.S. 7993
FEBRUARY 15, 2006
GRAPHIC SCALE
(IN FEET)
1 inch = 60 ft.
MONUMENT NOTES
R1 INDICATES RECORD DATA PER TRACT MAP NO. 16666, M.B. 302/55-56
○ INDICATES 1" I.P. & TAG OR NAIL & TAG "LS 7993" TO BE SET.
FOURTH STREET
EMPIRE COURT
CITY OF RANCHO CUCAMONGA
CITY OF ONTARIO
VIA TURIN
(ENTRANCE)
PUBLIC UTITLITY AND EMERGENCY ACCESS EASEMENT DEDICATED HEREON.
PARCEL 27
PARCEL 28
N.A.=8.91 ACRES
PARCEL 29
PARCEL 31
VIA ALBA (PRIVATE)
VIA VILLAGIO (PRIVATE)
PARCEL 23
PARCEL 22
PARCEL 30
SEE SHEET 10
SEE SHEET 11
SEE SHEET 13
CONCOURS
EASEMENT NOTE:
VIA ALBA (PRIVATE) AND VIA VILLAGIO (PRIVATE) STREETS DEDICATED HEREON TO THE CITY OF ONTARIO FOR PUBLIC UTILITY AND PUBLIC EMERGENCY ACCESS PURPOSES, AND ALSO RESERVED HEREON AS A PRIVATE EASEMENT FOR STREET, PRIVATE UTILITY, AND MAINTENANCE PURPOSES.
10' PUBLIC PEDESTRIAN ACCESS EASEMENT DEDICATED HEREON.

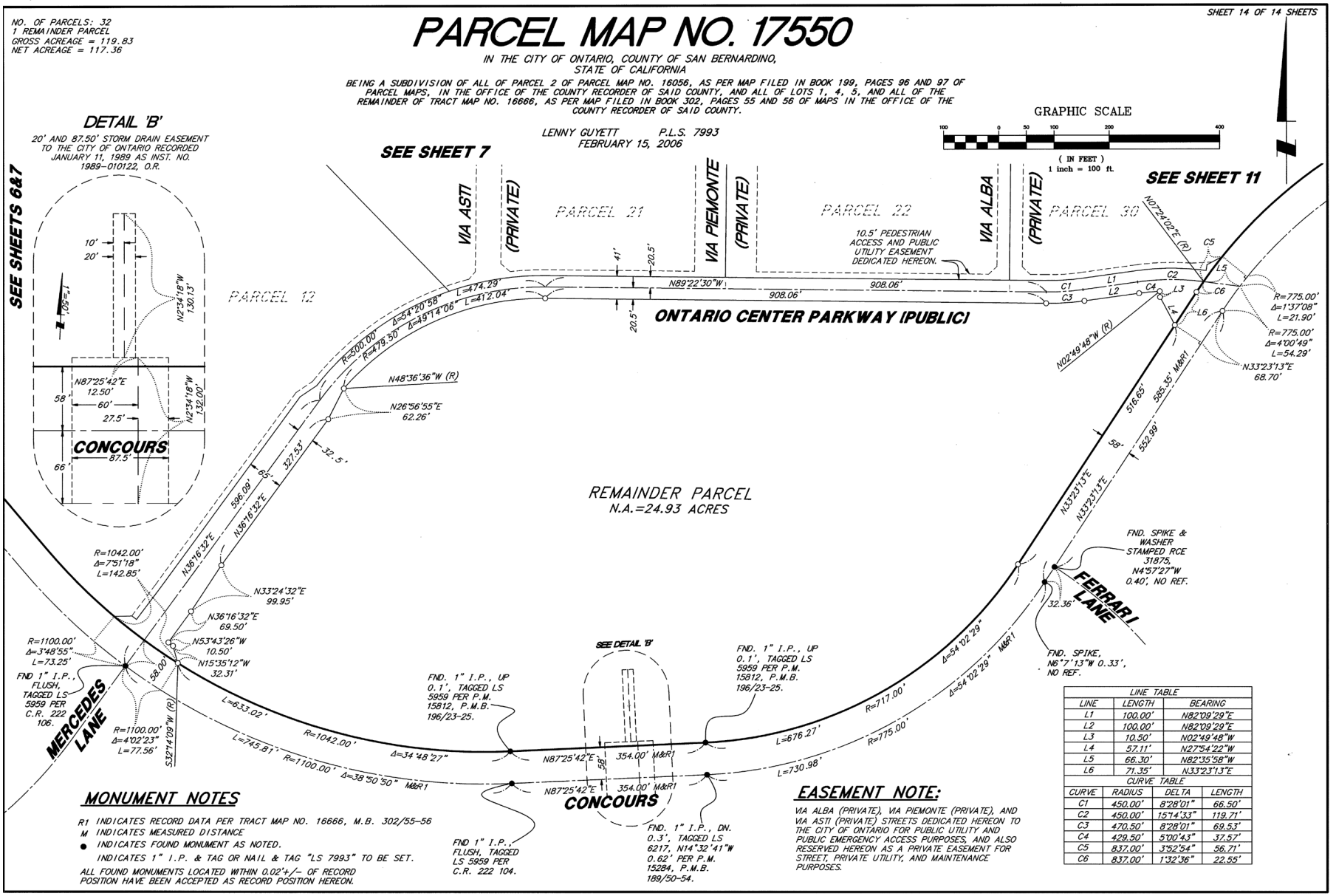

NO. OF PARCELS: 32
1 REMAINDER PARCEL
GROSS ACREAGE = 119.83
NET ACREAGE = 117.36
SHEET 13 OF 14 SHEETS
PARCEL MAP NO. 17550
IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA
BEING A SUBDIVISION OF ALL OF PARCEL 2 OF PARCEL MAP NO. 16056, AS PER MAP FILED IN BOOK 199, PAGES 96 AND 97 OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, AND ALL OF LOTS 1, 4, 5, AND ALL OF THE REMAINDER OF TRACT MAP NO. 16666, AS PER MAP FILED IN BOOK 302, PAGES 55 AND 56 OF MAPS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.
LENNY GUYETT P.L.S. 7993
FEBRUARY 15, 2006
GRAPHIC SCALE
60 0 30 60 120 240
(IN FEET)
1 inch = 60 ft.
EMPIRE COURT
CITY OF RANCHO CUCAMONGA
CITY OF ONTARIO
FOURTH STREET
N 89°22'30" W
2003.78'
2654.20'
(2654.25 R1)
FND. L.T. & T., LS 5959 IN SIDEWALK, IN LIEU OF 1" I.P. PER P.M. 15812, P.M.B. 196/23-25.
PARCEL 29
N.A.=0.64 AC
PARCEL 32
0.66 AC
VIA TURIN
(ENTRANCE)
PUBLIC UTILITY AND EMERGENCY ACCESS EASEMENT DEDICATED HEREON.
PARCEL 31
N.A.=10.68 ACRES
PARCEL 28
PARCEL 30
N.A.P.
SEE SHEET 12
PM 15912 PMB 193/33-35 PARCEL 1
PM 15912 PMB 193/33-35 PARCEL 2
PM 15912 PMB 193/33-35 PARCEL 3
CONCOURS
MONUMENT NOTES
R1 INDICATES RECORD DATA PER TRACT MAP NO. 16666, M.B. 302/55-56
M INDICATES MEASURED DISTANCE
○ INDICATES 1" I.P. & TAG OR NAIL & TAG "LS 7993" TO BE SET.
● INDICATES FOUND MONUMENT AS NOTED.
ALL FOUND MONUMENTS LOCATED WITHIN 0.02'+/- OF RECORD POSITION HAVE BEEN ACCEPTED AS RECORD POSITION HEREON.

2/6/19

6/1/2012

ae/ 9/2

April 2022



216/20

3473

NO. OF PARCELS: 1
24.93 ACRES GROSS
24.93 ACRES NET

SHEET 1 OF 2 SHEETS

PARCEL MAP NO. 17978

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO,
STATE OF CALIFORNIA

ALL OF THE REMAINDER PARCEL OF PARCEL MAP NO. 17550, AS PER MAP FILED IN BOOK 216, PAGES 7 THROUGH 20, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

MARISSA CROWTHER P.L.S. 6152
FEBRUARY 15, 2006

OWNER'S STATEMENT

WE HEREBY STATE THAT WE ARE ALL AND THE ONLY PARTIES HAVING ANY RECORD TITLE INTEREST IN THE LAND SUBDIVIDED AS SHOWN ON THE ANNEXED MAP, AND WE HEREBY CONSENT TO THE PREPARATION AND RECORDATION OF THIS PARCEL MAP.

WE HEREBY DEDICATE TO THE CITY OF ONTARIO A 10.5 FOOT EASEMENT FOR PEDESTRIAN ACCESS AND PUBLIC UTILITY PURPOSES, TO BE MAINTAINED BY THE PROPERTY OWNERS, AS SHOWN ON THE ANNEXED MAP.

THE CITY OF ONTARIO, A CALIFORNIA MUNICIPAL CORPORATION

BY: Gregory C. Devereaux

THE ONTARIO REDEVELOPEMENT AGENCY, A PUBLIC BODY, CORPORATE AND POLITIC

BY: Gregory C. Devereaux

NOTARY ACKNOWLEDGMENT

STATE OF CALIFORNIA)
ss
COUNTY OF SAN BERNARDINO)

ON SEPTEMBER 27, 2006, BEFORE ME, TRACI R. MCGINLEY NOTARY PUBLIC, PERSONALLY APPEARED GREGORY C. DEVEREAUX, PERSONALLY KNOWN TO ME (OR PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE) TO BE THE PERSON(S) WHOSE NAME(S) IS(ARE) SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/~~SHE/THEY~~ EXECUTED THE SAME IN HIS/~~HER/THEIR~~ AUTHORIZED CAPACITY(~~IES~~), AND THAT BY HIS/~~HER/THEIR~~ SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S) OR THE ENTITY UPON BEHALF OF WHICH THE PERSON(S) ACTED, EXECUTED THE INSTRUMENT.

WITNESS MY HAND AND OFFICIAL SEAL

SIGNATURE Traci R. McGinley TRACI R. MCGINLEY

COMMISSION # 1483449 — NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE

APRIL 13, 2008 — MY COMMISSION EXPIRES

NOTARY ACKNOWLEDGMENT

STATE OF CALIFORNIA)
ss
COUNTY OF SAN BERNARDINO)

ON SEPTEMBER 27, 2006, BEFORE ME, TRACI R. MCGINLEY NOTARY PUBLIC, PERSONALLY APPEARED GREGORY C. DEVEREAUX, PERSONALLY KNOWN TO ME (OR PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE) TO BE THE PERSON(S) WHOSE NAME(S) IS(ARE) SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/~~SHE/THEY~~ EXECUTED THE SAME IN HIS/~~HER/THEIR~~ AUTHORIZED CAPACITY(~~IES~~), AND THAT BY HIS/~~HER/THEIR~~ SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S) OR THE ENTITY UPON BEHALF OF WHICH THE PERSON(S) ACTED, EXECUTED THE INSTRUMENT.

WITNESS MY HAND AND OFFICIAL SEAL

SIGNATURE Traci R. McGinley TRACI R. MCGINLEY

COMMISSION # 1483449 — NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE

APRIL 13 2008 — MY COMMISSION EXPIRES

ABANDONMENT NOTE

PURSUANT TO SECTION 66499.20-1/2 OF THE SUBDIVISION MAP ACT, THE FILING OF THIS MAP CONSTITUTES ABANDONMENT OF THAT CERTAIN EASEMENT FOR STORM DRAIN PURPOSES IN FAVOR OF THE CITY OF ONTARIO RECORDED JANUARY 11, 1989 PER INSTRUMENT NO. 1989-010122 OF OFFICIAL RECORDS OF SAN BERNARDINO COUNTY.

SURVEYOR'S STATEMENT

I, MARISSA CROWTHER, HEREBY STATE THAT I AM A LICENSED LAND SURVEYOR OF THE STATE OF CALIFORNIA AND THAT THIS MAP, CONSISTING OF TWO SHEETS IS A TRUE AND COMPLETE REPRESENTATION OF A SURVEY MADE BY ME OR UNDER MY DIRECTION IN MARCH 2005 AT THE REQUEST OF PANATTONI DEVELOPEMENT, AND THAT ALL THE MONUMENTS SHOWN HEREON ARE OF THE CHARACTER AND OCCUPY THE POSITIONS INDICATED, IN COMPLIANCE WITH SECTION 66495 AND 66496 OF THE SUBDIVISION MAP ACT AND ARE OR WILL BE SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED. I HEREBY STATE THAT THIS PARCEL MAP SUBSTANTIALLY CONFORMS WITH THE CONDITIONALLY APPROVED TENTATIVE MAP, IF ANY.

MARISSA CROWTHER, PLS 6152
REGISTRATION EXPIRES: 3-31-08

SEPT 19 2006
DATED:

PROFESSIONAL LAND SURVEYOR MARISSA CROWTHER EXP. 3-31-08 STATE OF CALIFORNIA

CITY ENGINEER'S STATEMENT

I HEREBY STATE THAT I HAVE EXAMINED THIS MAP, AND THAT THE SUBDIVISION SHOWN HEREON IS SUBSTANTIALLY THE SAME AS IT APPEARED ON THE TENTATIVE MAP AND ANY APPROVED ALTERATIONS THEREOF, AND THAT ALL THE PROVISIONS OF THE SUBDIVISION MAP ACT AND CITY OF ONTARIO MUNICIPAL CODE HAVE BEEN COMPLIED WITH AND I AM SATISFIED THAT THIS MAP IS TECHNICALLY CORRECT.

JOHN P. SULLIVAN
CITY ENGINEER, R.C.E. 24079
CITY OF ONTARIO, CALIFORNIA
REGISTRATION EXPIRES: 12/31/07

REGISTERED PROFESSIONAL ENGINEER JOHN P. SULLIVAN No. 24079 Exp. 12-31-07 CIVIL STATE OF CALIFORNIA

9-25-06
DATED:

PLANNING COMMISSION'S STATEMENT

I DO HEREBY STATE THAT THE SUBDIVISION SHOWN ON THE ANNEXED MAP IS IN ACCORDANCE WITH THE TENTATIVE MAP APPROVED AT A MEETING OF THE PLANNING COMMISSION OF THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, HELD ON THE TWENTY-FIFTH DAY OF APRIL, 2006.

9.21.06
DATED:

BY: Jerry L. Blum
JERRY L. BLUM
SECRETARY OF THE ONTARIO PLANNING COMMISSION

CITY COUNCIL'S STATEMENT

I HEREBY STATE THAT THE CITY COUNCIL OF THE CITY OF ONTARIO BY RESOLUTION NO. 2006-033, DULY SECONDED, PASSED AND APPROVED THE ANNEXED MAP ON THE 6TH DAY OF JUNE, 2006, AND ACCEPTED THE DEDICATION TO THE CITY OF ONTARIO OF A 10.5 FOOT EASEMENT FOR PEDESTRIAN ACCESS AND PUBLIC UTILITY PURPOSES, SUBJECT TO THE IMPROVEMENT IN ACCORDANCE WITH CITY STANDARDS, AS SHOWN ON THE ANNEXED MAP, AND ALSO ACCEPTED THE ABANDONMENT OF THAT CERTAIN EASEMENT FOR STORM DRAIN PURPOSES IN FAVOR OF THE CITY OF ONTARIO RECORDED JANUARY 11, 1989 PER INSTRUMENT NO. 1989-010122 OF OFFICIAL RECORDS OF SAN BERNARDINO COUNTY.

CITY OF ONTARIO INCORPORATED DECEMBER 1891 CALIFORNIA

09-26-06
DATED:

Debora Thomsen
DEBORA THOMSEN
CITY CLERK, DEPUTY
CITY OF ONTARIO, CALIFORNIA

AUDITOR'S STATEMENT

I HEREBY STATE THAT ACCORDING TO THE RECORDS OF THIS OFFICE, AS OF THIS DATE, THERE ARE NO LIENS AGAINST THE REAL PROPERTY SHOWN UPON THE ANNEXED MAP FOR UNPAID STATE, COUNTY, MUNICIPAL OR LOCAL TAXES, OR SPECIAL ASSESSMENTS COLLECTED AS TAXES, EXCEPT TAXES OR SPECIAL ASSESSMENTS NOT YET PAYABLE, ESTIMATED TO BE $0.

LARRY WALKER, COUNTY AUDITOR/~~CONTROLLER~~
COUNTY OF SAN BERNARDINO

10/02/06
DATED:

BY: Jenn Mooney
DEPUTY

BOARD OF SUPERVISOR'S STATEMENT

I HEREBY STATE THAT A BOND IN THE SUM OF $ 0 HAS BEEN EXECUTED AND FILED WITH THE BOARD OF SUPERVISORS ~~SECURING~~ OF THE COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, CONDITIONED UPON THE PAYMENT OF ALL TAXES, STATE, COUNTY, MUNICIPAL, OR LOCAL, AND ALL SPECIAL ASSESSMENTS, COLLECTED AS TAXES, WHICH AT THE TIME OF FILING OF THE ANNEXED MAP WITH THE COUNTY RECORDER IS A LIEN AGAINST SAID PROPERTY, BUT NOT YET PAYABLE AND THAT THE SUBDIVIDER HAS FILED WITH ME A CERTIFICATE BY THE PROPER OFFICER GIVING HIS ESTIMATE OF THE AMOUNT OF SAID TAXES AND ASSESSMENTS, AND SAID BOND I HEREBY ACCEPTED.

SEAL
DENA M. SMITH
CLERK OF THE BOARD OF SUPERVISOR'S OF
THE COUNTY OF SAN BERNARDINO

10/02/06
DATED:

BY: Jenn Mooney
DEPUTY

COUNTY RECORDER'S CERTIFICATE

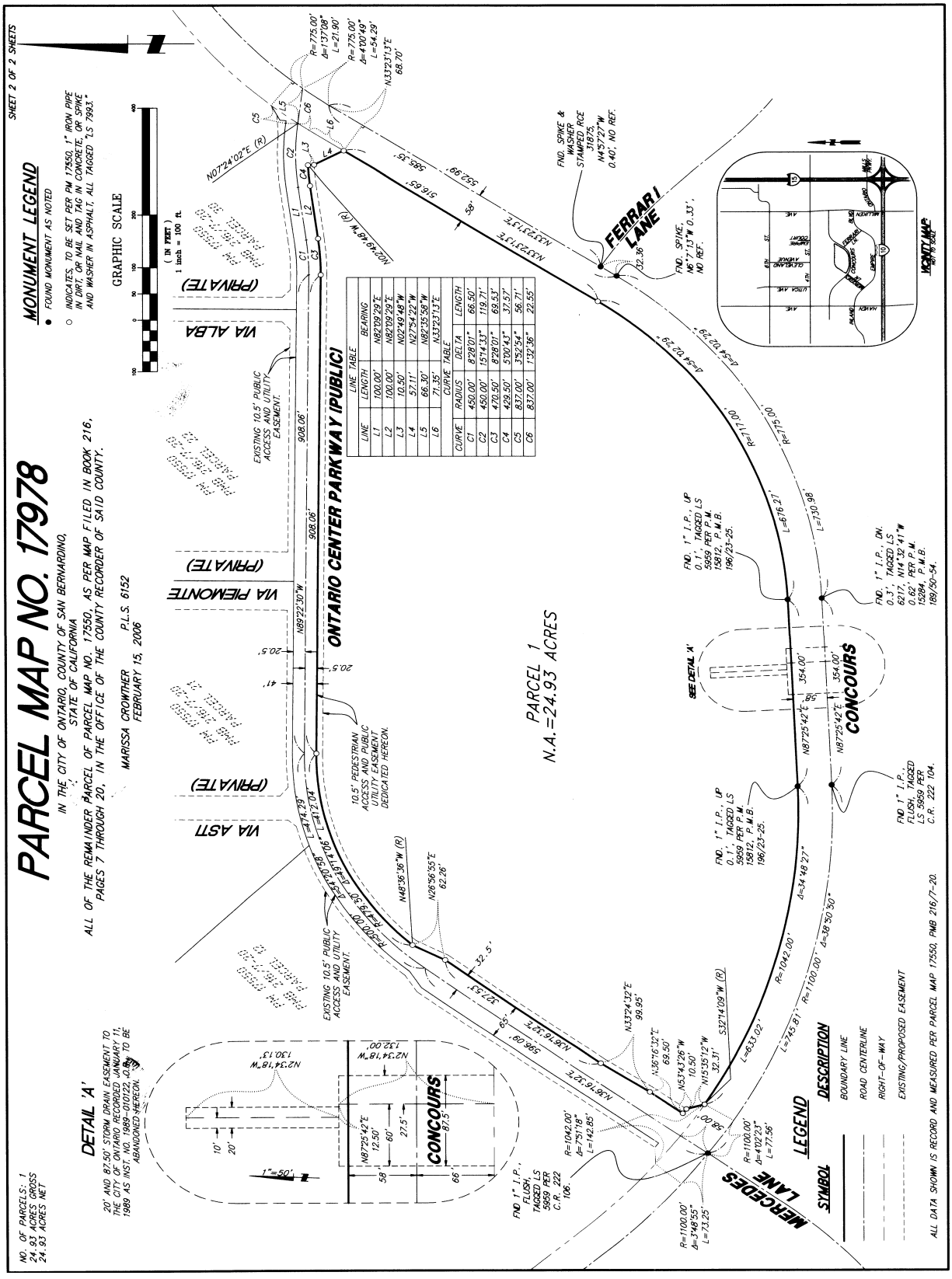
THIS MAP HAS BEEN FILED UNDER DOCUMENT NUMBER 2006-0673115
THIS 2ND DAY OF OCTOBER 2006 AT 1:09 P.M. IN BOOK 211 OF PARCEL MAPS AT PAGE(S) 44-45,
AT THE REQUEST OF FIRST AMERICAN TITLE,
IN THE AMOUNT OF $ 0

* 1:09PM

Recorded in Official Records, County of San Bernardino
Doc#: 2006-0673115
10/02/2006 1:09 PM

LARRY WALKER, COUNTY AUDITOR
THE COUNTY OF SAN BERNARDINO

BY: Diana T. Hernandez
DEPUTY RECORDER


PARCEL MAP NO. 17978
IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA
ALL OF THE REMAINDER PARCEL OF PARCEL MAP NO. 17550, AS PER MAP FILED IN BOOK 216, PAGES 7 THROUGH 20, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.
MARISSA CROWTHER P.L.S. 6152
FEBRUARY 15, 2006
SHEET 2 OF 2 SHEETS
MONUMENT LEGEND
FOUND MONUMENT AS NOTED
INDICATES, TO BE SET PER PM 17550, 1" IRON PIPE IN DIRT, OR NAIL AND TAG IN CONCRETE, OR SPIKE AND WASHER IN ASPHALT, ALL TAGGED "LS 7993."
GRAPHIC SCALE
(IN FEET)
1 inch = 100 ft.
ONTARIO CENTER PARKWAY (PUBLIC)
VIA ALBA (PRIVATE)
VIA PIEMONTE (PRIVATE)
VIA ASTI (PRIVATE)
FERRARI LANE
MERCEDES LANE
CONCOURS
SEE DETAIL 'A'
PARCEL 1
N.A.=24.93 ACRES
DETAIL 'A'
20' AND 87.50' STORM DRAIN EASEMENT TO THE CITY OF ONTARIO RECORDED JANUARY 11, 1989 AS INST. NO. 1989-010122, TO BE ABANDONED HEREON.
1"=50'
10.5' PEDESTRIAN ACCESS AND PUBLIC UTILITY EASEMENT DEDICATED HEREON.
EXISTING 10.5' PUBLIC ACCESS AND UTILITY EASEMENT.
LINE TABLE
LINE | LENGTH | BEARING
L1 | 100.00' | N8209'29"E
L2 | 100.00' | N8209'29"E
L3 | 10.50' | N0249'48"W
L4 | 57.11' | N2754'22"W
L5 | 66.30' | N8235'58"W
L6 | 71.35' | N3323'13"E
CURVE TABLE
CURVE | RADIUS | DELTA | LENGTH
C1 | 450.00' | 8°29'01" | 66.50'
C2 | 450.00' | 15°14'33" | 119.71'
C3 | 470.50' | 8°29'01" | 69.53'
C4 | 429.50' | 5°00'43" | 37.57'
C5 | 837.00' | 3°52'54" | 56.71'
C6 | 837.00' | 1°32'36" | 22.55'
FND. SPIKE & WASHER STAMPED RCE 31875, N45°27'W 0.40', NO REF.
FND. SPIKE, N6°7'13"W 0.33', NO REF.
FND. 1" I.P., UP 0.1', TAGGED LS 5959 PER P.M. 15812, P.M.B. 196/23-25.
FND. 1" I.P., DN. 0.3', TAGGED LS 6217, HAT 32°41'W 0.68', PER P.M. 15812, P.M.B. 189/50-54.
FND. 1" I.P., FLUSH, TAGGED LS 5959 PER C.R. 222 104.
FND. 1" I.P., FLUSH, TAGGED LS 5959 PER C.R. 222 106.
NO. OF PARCELS: 1
24.93 ACRES GROSS
24.93 ACRES NET
LEGEND
SYMBOL | DESCRIPTION
BOUNDARY LINE
ROAD CENTERLINE
RIGHT-OF-WAY
EXISTING/PROPOSED EASEMENT
ALL DATA SHOWN IS RECORD AND MEASURED PER PARCEL MAP 17550, PMB 216/7-20.

APPENDIX B - SUBAREAS

Table B.1: 2021 Piemonte Overlay OCSP Parcels/Subarea Correlation

OCSP Parcel Numbers or Portions Thereof	Subareas
1, 2, 3, 4, 5, 6, 7, 8, 9	1
10	2
11	3
12, 13	4
14, 15	5
16, 17, 18, 19	6
20	7, 8
21	9
22	10
23	11, 12
24, 25, 26, 27	13
28, 29, 31, 32	14
30	15
Remainder Parcel	16, 17, 18, 19

APPENDIX C - ONTARIO CENTER SPECIFIC PLAN STATISTICAL SUMMARY

Table C.1: Statistical Areas D & E / Planning Areas 7, 8, 9, 10, 12 & 15

Development	Maximum GFA (in SF)	Maximum No. DUs
Existing or Entitled Development		
955 N Duesenberg Dr (Vintage Apartments) - 300 DUs		309
950 N Duesenberg Dr (Camden Landmark Apartments) - 472 DUs		491
4000 E Ontario Center Parkway (Arena)	200,020	
1051 N Milliken Ave (Kohl's)	96,736	
1041 N Milliken Ave (Starbucks)	1,500	
1021 N Milliken Ave (Applebee's)	4,603	
4290 E Fourth St (El Pollo Loco)	2,406	
4275 E Concours St (Home Thai/Professional Nail/Sunrise Optometry)	8,528	
4295 E Concours St (Comerica Bank)	3,262	
901 N Via Piemonte (5-story Office)	125,685	
4150 E Fourth St (Spa/Wax Center/Weight Watchers)	8,385	
4190 E Fourth St (Jeweler/Hair Salon/Dentist)	7,320	
4240 E Fourth St (Wells Fargo)	4,845	
4120 E Fourth St (Big Al's/Petsmart/DSW Shoes)	91,280	
4200 E Fourth St (Target = 140,941 SF + 10,800 SF garden center)	151,742	
900 N Via Piemonte (Marriott - Element Ontario Hotel, 131 rooms)	92,823	
901 N Via Piemonte (Office)	125,685	
Southwest Corner of N Via Alba & E Via Villagio - 72 DUs		72
Northeast Corner of Ontario Center Pkwy & N Via Alba - 110 DUs		110
Total	**924,823**	**982**
Remaining Allocation		
Office/Commercial	608,488	
Hotel 1 - 131 Rooms	87,177	
Hotel 2 - 100 Rooms	110,400	
Residential Units	483,600	**1,500
Total	**1,382,488**	
GRAND TOTAL	**2,840,000**	**2,300**

Note: ** Residential units replace office/retail gross floor area (GFA) at the rate of one dwelling unit for each 600 SF of office/commercial GFA (based on equivalent traffic generation, water demand, and wastewater generation rates).

Table C.2: Statistical Area D / Planning Area 7

Development	Maximum GFA (in SF)
Existing Development	
Vintage Apartments - 300 DUs	290,151
Total	**290,151**
Remaining Allocation	
Office/Commercial	239,449
Hotel - 100 Rooms	110,400
Total	**349,849**
GRAND TOTAL	**640,000**

Table C.3: Statistical Area E / Planning Areas 8, 9 & 10

Development	Maximum GFA (in SF)
Existing or Entitled Development	
Camden Apartments - 472 DUs	461,049
Arena	200,020
Kohl's	96,736
Starbucks	1,500
Applebee's	4,603
El Pollo Loco	2,406
Home Thai/Nails/Optometry	8,528
Comerica Bank	3,262
5-Story Office	125,685
Spa/Waxing/Weight Watchers	8,385
Jeweler/Hair Salon/Dentist	7,320
Wells Fargo	4,845
Big Al's/Petsmart/DSW Shoes	91,280
Target	151,742
Marriott - Element Ontario Hotel (131 rooms)	92,823
901 N Via Piemonte (Office)	125,685
Southwest Corner of N Via Alba & E Via Villagio (72 units)	
Northeast Corner of Ontario Center Pkwy & N Via Alba (110 units)	
Total	**1,385,859**
Remaining Allocation	
Office/Commercial	243,354
Hotel - 105 Rooms	87,177
Residential - 806 DUs	483,600
Total	**1,032,639**
GRAND TOTAL	**2,200,000**

APPENDIX D - 2006 OVERLAY LAND USE ALLOCATION & MAXIMUM DEVELOPMENT INTENSITY ANALYZED FOR TRAFFIC GENERATION

The 2006 traffic analysis for the Piemonte at Ontario Center Project Addendum to the Ontario Center EIR (Applied Planning Inc., February 2006) used the anticipated development shown in Table D.1: 2006 Piemonte Overlay Intensity Allocation by Subarea for Traffic Analysis to determine the remaining traffic capacity for the Overlay area. That traffic analysis used lower numbers that were permitted by the 2006 Overlay. However, it also concluded that the 2006 Piemonte Overlay only used 28% of the daily trips, 29% of the peak daily evening trips and 92% of the peak morning trips.

Table D.1: 2006 Piemonte Overlay Intensity Allocation by Subarea for Traffic Analysis

Sub-areas	Net Acres	Land Use					Maximum Floor Area	Maximum Dwelling Units
		Commercial	Entertainment/ Retail	Special Use (Hotel)	Offices	Residential		
1	13.02	•	•	100 Rooms	•		220,713	
2	2.28				•		24,800	
3	1.36	•			•		18,000	
4	12.35				•		251,370	
5	8.29					•		403
6	3.20	•	•		•		43,300	
7	2.68	•	•			•	25,300	170
8	0.76							
9*	5.16				•		125,685	
10	3.24			236 Rooms			180,000	
11	0.91		•			•	32,300	218
12	2.49							
13	4.07		•				49,200	
14*	20.35	•			•		228,400	
15	4.27				•		93,000	
Totals	84.43						1,292,068	791
* Built-out Subarea								

APPENDIX E - PIEMONTE TRIP GENERATION COMPARISON AND THE PIEMONTE/EMPIRE LAKES 4TH STREET ACCESS CONFIGURATION - FEHR & PEERS MEMORANDUM (DATED JUNE 8, 2016)

Fehr & Peers completed a draft Transportation Impact Study (TIS) for the proposed Empire Lakes project in the City of Rancho Cucamonga. That study documented potential transportation impacts associated with the proposed project.

Since completing that study, we have completed a trip generation estimate for the Piemonte Site based on their most recent site plan that will be submitted to the City of Ontario. We also completed additional work in support of designing the 4th Street access to both the Piemonte Site and the Empire Lakes site. The purpose of this memorandum is to document the methodology, recommendations, and results of the project access assessment.

Piemonte Trip Generation Estimates

Piemonte Trip Generation As Approved

As part of the Empire Lakes traffic study, the portion of the Piemonte Site that has not yet been developed was estimated using information from the Piemonte at Ontario Center Project Addendum to the Ontario Center EIR (Applied Planning Inc., February 2006). Table E-1: Piemonte Trip Generation – As Currently Approved summarizes the trip generation estimate used in the Empire Lakes traffic study:

Table E-1: Piemonte Trip Generation – As Approved in 2006

Use	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Total Net Piemonte (From Study)	29,800	1,284	812	2,096	1,124	1,471	2,595
Parcel 1 (Constructed)	4,990	71	46	117	150	162	312
Parcel 2 (Constructed)	3,182	69	54	123	99	104	203
Parcel 10 (Constructed)	1,107	154	21	175	29	140	169
Undeveloped Piemonte	**20,521**	**990**	**691**	**1,681**	**846**	**1,065**	**1,911**

Source: Piemonte at Ontario Center Project Addendum to the Ontario Center EIR (Applied Planning Inc., February 2006).

As shown in Table E-1: Piemonte Trip Generation – As Currently Approved, the portion of Piemonte that is not yet developed is estimated to generate 20,521 daily trips, 1,681 AM peak hour trips, and 1,911 PM peak hour trips. These trips were utilized in the Empire Lakes traffic study.

Piemonte Trip Generation As Currently Proposed

The site concept for the Piemonte site provided by Lewis Operating Companies (dated March 11, 2016) is attached. Using this site plan, Fehr & Peers estimated the trip generation for the project site as shown in Table E-2: Piemonte Trip Generation – As Proposed in 2016 on the following page.

As shown in Table E-2: Piemonte Trip Generation – As Proposed in 2016, with the proposed site plan the undeveloped portion of Piemonte would be projected to generate 13,905 daily trips, 957 AM peak hour trips, and 1,357 PM peak hour trips.

Table E-3: Piemonte Trip Generation Comparison of 2006 and 2016 Data compares the as-approved trip generation to the currently proposed trip generation. As shown in the table, the undeveloped portion of Piemonte, as currently proposed, is anticipated to generate 6,616 fewer daily trips, 724 fewer AM peak hour trips, and 554 fewer PM peak hour trips.

Given that the currently proposed development in Piemonte is less than what was approved, the assumptions in the Empire Lakes traffic study is considered conservative as part of this effort.

Table E-2: Piemonte Trip Generation – As Proposed in 2016

Use	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Lewis and Lincoln Proposed Uses							
Zone 1 - Retail	3,822	53	33	86	159	173	332
Zone 2 - Office	552	69	9	78	13	62	75
Zone 3 - Residential	1,915	29	118	147	116	63	179
Zone 4 - Residential	1,144	18	70	88	69	38	107
Zone 4 - Retail	3,565	50	30	80	149	161	310
Zone 5 - Residential	765	12	47	59	46	25	71
Total Gross Trip Generation Proposed	**11,763**	**231**	**307**	**538**	**552**	**522**	**1,074**
Internalization (Consistent with Previous Study) 17% Daily, 12% AM Peak Hour, 18% PM Peak Hour	**-2,000**	**-28**	**-37**	**-65**	**-99**	**-94**	**-193**
Total Trip Generation	**9,763**	**203**	**270**	**473**	**453**	**428**	**881**
Parcel 6 Trip Generation (from previous study)	1,928	81	52	133	74	65	139
Parcel 13 Trip Generation (from previous study)	2,214	309	42	351	57	280	337
Total New Trips In Piemonte	**13,905**	**593**	**364**	**957**	**584**	**773**	**1,357**

Source: Fehr & Peers, 2016. Site Plan provided by Lewis Operating Companies (March 2016). Note: Parcel 6 and Parcel 13 are not included in the Lewis Site Plan and trip generation from the previous Applied Planning dated February 2006 study is used.

Table E-3: Piemonte Trip Generation Comparison of 2006 and 2016 Data

Use	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Undeveloped Piemonte (as approved)	20,521	990	691	1,681	846	1,065	1,911
Undeveloped Piemonte (as proposed)	13,905	593	364	957	584	773	1,357
Net Difference	**-6,616**	**-397**	**-327**	**-724**	**-262**	**-292**	-554

Source: Fehr & Peers, 2016

4Th Street Access Methodology

Given the proximity of up-stream and down-stream intersections to the proposed site access, micro-simulation was utilized to evaluate traffic operations. Micro-simulation utilizes driver behavior parameters to simulate how driver decisions affect traffic operations. Additionally, micro-simulation has the ability to evaluate how vehicles queues can extend over space and time and account for the operational effects associated with those queues.

To evaluate the network, Fehr & Peers utilized the SimTraffic 8.0 software which is consistent with the Highway Capacity Manual methodology (Transportation Research Board, 2010). Assumptions utilized in this assessment specific to this software are documented below:

- Lane configurations utilized are based on the proposed design shown in Attachment A
- Signal timing information began with existing timing data provided by the City and were optimized for the corridor related to signal timing splits and timing offsets
- A base saturation flow rate of 1,900 vehicles per hour per lane
- A peak hour factor of 0.95 was applied
- A total of 20 simulations were completed with different random seeds
- The results are based on the average of all 20 runs as there were no "outliers" in the simulation results
- The simulation results were utilized to assist in designing the intersection for both level of service and to accommodate expected queues
- Fehr & Peers updated the trip assignment information to/from the Piemonte to reflect the trip generation information noted above based on the locations of land use provided on the attached site plan.

Please note that the analysis for site access focused on the forecasts developed for the cumulative scenario. This provides the highest volume of traffic and is considered the most appropriate scenario for sizing infrastructure.

4Th Street Access Analysis Results

The level of service (LOS) was calculated for both the 4th Street/Cleveland Avenue and 4th Street/The Vine study intersections to evaluate traffic operations. LOS is a qualitative measure of traffic operating conditions whereby a letter grade, from A (the best) to F (the worst), is assigned. These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with driving. Table E-4: Intersection HCM LOS Criteria describes the LOS thresholds for signalized intersections identified in the HCM. Table E-5: Cumulative Plus Project Conditions Intersection LOS (2016) summarizes the AM and PM peak hour level of service results for the two study intersections. Table E-6: Cumulative Plus Project Left-Turn Queues (2016) summarizes the queues at the intersections.

Table E-4: Intersection HCM LOS Criteria

LOS	Description	Signalized Delay (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle length.	< 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10.0 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	> 80.0

Source: Highway Capacity Manual (Transportation Research Board, 2010).

Table E-5: Cumulative Plus Project Conditions Intersection LOS (2016)

Intersection		Traffic Control	Peak Hour	Delay	LOS
19	4th Street/Cleveland Avenue	Signal	AM	16.0	B
			PM	20.8	C
20	4th Street/The Vine (Project Access)	Signal	AM	14.8	B
			PM	16.7	B

Notes:

1. Delay is calculated using SimTraffic Micro-Simulation using HCM 2010 Methodology

Source: Fehr & Peers, 2016

Table E-6: Cumulative Plus Project Left-Turn Queues (2016)

Location	AM	PM
4th Street/Cleveland Avenue Intersection		
Eastbound Left-Turn (225′)	225′	77′
Westbound Left-Turn (142′ Storage)	140′	133′
4th Street/The Vine Intersection		
Eastbound Left-Turn[1] (310′ Storage)	106′	257′
Westbound Left-Turn[1] (250′ Storage)	191′	206′

Notes:

Queues reported from Synchro and represent the 95th-percentile queue.

Bold indicates where queue exceeds available storage.

1. Proposed Configuration has dual lanes. Total queue in both lanes reported

Source: Fehr & Peers, 2016

As shown in Table E-5: Cumulative Plus Project Conditions Intersection LOS (2016), both study intersections are projected to operate at acceptable levels of service during both peak hours. Additionally, as shown in Table E-6: Cumulative Plus Project Left-Turn Queues (2016), the queues are accommodated in the proposed turn pockets.

APPENDIX F - TOYOTA ARENA MIXED-USE DEVELOPMENT TRAFFIC IMPACT ANALYSIS - RK Engineering Group (September 17, 2021)

RK Engineering Group, Inc. completed a draft Transportation Impact Analysis (TIA) for the proposed mixed-use development . That study documented potential transportation impacts associated with the proposed project.

The purpose of this memorandum is to document the methodology, recommendations, and results of the project access assessment.

Mixed-Use Trip Generation Estimates

The mixed-use development capacity and trip generation associated with the 2022 Piemonte Overlay Specific Plan Amendment has been analyzed. Table F-1: OCSP Trip Generation Cmoparison with Proposed Mixed-Use Land Uses (SA 8, 11, 16 & 17) summarizes the trip generation estimate used in the traffic analysis:

Table F-1: OCSP Trip Generation Comparison with Proposed Mixed-use Land Uses (SA 8, 11, 16 & 17)

	Daily	AM Peak Hour	PM Peak Hour
Allowable trips per OCSP	98,837	1,961	7,556
Total Net Adept-Piemonte Trips	5,691	300	458
Trip Generation Difference Between OCSP and proposed Overlay Amendment	93,146	1,661	7,098
Percent of Trips Use by proposed Overlay Amendment	6.1%	18%	6.4%

The Traffic Impact Analysis compared the proposed Mixed-use Land use trip generation to the available trip counts allowed under the Ontario Center Specific Plan. In summary, the OCSP has a remaining trip capacity of 98,837 daily trips, and the proposed Mixed-use is anticipated to generate a net trip count of 5,691, which is well within the remaining capacity established for the OCSP area. In addition, the peak hour trip counts for the proposed Mixed-use land uses, 300

trips in the AM and 458 trips in the PM, are also within the peek hour Allowable trips per OCSP.

CEQA Vehicle Miles Traveled Analysis

Development projects within the Piemonte Overlay are subject to a Vehicle Miles Traveled (VMT) analysis, purupsant to the recommendations and practices described in Planning Commission Resolution No. PC20-021.

According to City guidelines, land use projects located within a Transit Priority Area (TPA) and have the following project characteristics are presumed to have a less than significant impact absent substantial evidence to the contrary:

- Has a Floor Area Ratio of 0.75 or higher;
- Includes no more parking for residents, customers or employees than the City Development Code mandades;
- Is consisten with the Sustainable Communitys Strategy (SCS) as determined by the City with input from SCAG or SBCTA; and
- If there are existing affordable residential units, replaces those residential units with at least as many similarly affordable units and not with a smaller number of moderate or hight-income residential units.

Certain areas within the Piemonte Overlay are within the TPA and may qualify to be presumed to have a less than significant impact.

APPENDIX G - OCSP PLANTING MATRIX

Table G.1: Applicable OCSP Planting Matrix

Species (*Latin name* - Common name)	Concours Street	Fourth Street	Haven Avenue	Primary Entrance Statement	Secondary Entrance Statement
TREES (P = Primary Tree, S = Secondary Tree)					
Acacia saligna – Willow Acacia		S			
Arbutus unedo – Strawberry Tree					X
Bauhinia variegata – Orchid Tree					X
Brachychiton acerfolius – Flame Tree		S			
Brachychiton populneum – Bottle Tree	S	S			
Celtis australis – European Hackberry					X
Chorisia speciosa – Floss-silk Tree	P	P		X	X
Cinnamomum camphora – Camphor Tree		P		X	X
Cupaniopsis anacardiodes – Carrotwood				X	X
Eriobotrya deflexa – Loquat					X
Ficus nitida – Ficus	S		P	X	
Ficus religiosa – Bo Tree				X	
Ficus rubiginosa – Rusty Leaf Fig				X	X
Fraxinus velutina 'Modesto' – Modesto Ash				X	
Geijera parvifolia – Australian Willow					X
Quercus kelloggii – California Black Oak					X
Quercus rubra – Red Oak	S				
Quercus suber – Cork Oak	P				
Schinus Molle – California Pepper *			S		
Sophora japonica – Japanese Pagoda Tree				X	X
Ulmus parvifolia – Chinese Evergreen Elm	S				X
Washingtonia robusta – Mexican Fan Palm				X	X
Washingtonia filifera – California Fan Palm		S	S	X	X
SHRUBS					
Acacia spp. – Wattle					X
Abelia grandiflora – Glossy Abelia				X	X
Abelia grandiflora 'Edward Goucher' – Dwarf Glossy Abelia				X	
Agapanthus spp. – Lily of the Nile				X	X
Callistemon spp. – Bottlebrush					X
Carissa spp. – Natal Plum				X	X

Table G.1: Applicable OCSP Planting Matrix (Continued)

Species (*Latin name* - Common name)	Concours Street	Fourth Street	Haven Avenue	Primary Entrance	
Carissa grandiflora 'Tuttlei' – Dwarf Natal Plum				X	
Cercis occidentalis – Western Redbud					X
Clivia Miniata – Clivia				X	X
Cotneaster spp. – Cotoneaster					X
Dietes vegeta – Fortnight Lily				X	X
Grevillea noellii – NCN				X	X
Hemerocallis spp. – Daylily				X	X
Hypericum Calycinum – Aaron's Beard					X
Ilex spp. – Holly				X	X
Iris spp. – Iris					X
Juniperus spp. – Juniper				X	X
Kniphofia uvaria – Red Hot Poker					X
Lantana camara				X	X
Nandina domestica – Heavenly Bamboo				X	X
Nandina 'Harbor Dwarf' – Dwarf Bamboo				X	X
Nerium oleander – Oleander				X	X
Pennisetum setaceum – Fountain Grass					
Photinia spp. – Photinia				X	X
Pittosporum spp. – Pittosporum				X	X
Pittosporum tobira 'Wheeleri' – Dwarf Pittosporum				X	X
Plumbago auriculata – Cape Plumbago					X
Podocarpus macrocarpa – Yew Pine				X	X
Potentilla fruticosa – Cinquefoil				X	X
Prunus Caroliniana – Carolina Laurel Cherry					X
Pyracanthus spp. – Pyracantha					X
Raphiolepis spp – Indian Hawthorn				X	X
Viburnum spp. – Viburnum					
Xylosma congestum – Shiny Xylosma				X	X
Yucca schottii					

Table G.1: Applicable OCSP Planting Matrix (Continued)

Species (*Latin name* - Common name)	Concours Street	Fourth Street	Haven Avenue	Primary Entrance	
GROUNDCOVER					
Ajuga reptans – Bronze Ajuga				X	X
Anigozanthos spp. – Kangaroo Paw					X
Bouganvillea spp.				X	X
Carissa grandiflora				X	X
Carpobrotus edulis – Hottentot Fig				X	X
Cerastium tomentosum – Snow-in-Summer				X	
Delosperma alba – White Iceplant				X	X
Drosanthemum hispidum – Rosea Iceplant				X	X
Fragaria chiloensis – Wild Strawberry					X
Gazania spendens – Clumping Gazania				X	X
Hedera helix ' Needlepoint' – Needlepoint Ivy					X
Jasminum humile – Italian Jasmine				X	X
Lantana spp.				X	X
Oenothera berlandieri – Mexican Evening Primrose					X
Pelargonium peitatum – Ivy Geranium				X	X
Potentilla verna – Spring Clinquefoil					X
Rosmarinus officinalis – Rosemary				X	X
Santolina spp. – Lavender Cotton				X	X
Sedum spp. – Sedum				X	X
Tracheiospenium jasminoides – Star Jasmine				X	X
Verbena peruviana – Verbena					X
Vinca minor – Dwarf Periwinkle				X	X
Vinca rosea – Madagascar Periwinkle				X	X
VINES					
Anemopaigma chamberlaynii – Yellow Trumpet Vine					X
Bougainvillea – NCN				X	X
Clytostoma callistegiodes – Violet Trumpet Vine					X
Gelsemium – Carolina Jessamine				X	X
Macfadyena unguis-cati – Cat's Claw					X
Parthenocissus tricuspidata – Boston Ivy				X	X
Tecomaria capensis – Cape Honeysuckle				X	X

Source: The Ontario Center Specific Plan (P&D Technologies) Updated April 2005.

CITY OF ONTARIO *Agenda Report* **April 19, 2022**	**SECTION:** **PUBLIC HEARINGS**
Department: Planning Prepared By: Luis Batres Staff Member Presenting: Scott Murphy, Executive Director Community Development Approved By:	Submitted To: Council/OHA Approved: _____ Continued To: _____ Denied: _____ Item No: 20

SUBJECT: **A PUBLIC HEARING TO CONSIDER FILE NO. PCUP21-009, A CONDITIONAL USE PERMIT TO ESTABLISH A 128-ROOM LIMITED-SERVICE HOTEL ON 1.83 ACRES OF LAND LOCATED AT 5060 EAST FOURTH STREET, WITHIN THE FREEWAY COMMERCIAL LAND USE DISTRICT OF THE EXCHANGE SPECIFIC PLAN (APN: 0238-012-30)**

RECOMMENDATION: That the City Council consider and adopt a Resolution approving the Conditional Use Permit, File No. PCUP21-009, establishing a 128-room limited-service hotel located at 5060 East Fourth Street.

THE FOLLOWING COUNCIL GOALS ARE BEING ACHIEVED:
Invest in the Growth and Evolution of the City's Economy
Operate in a Businesslike Manner
Focus Resources in Ontario's Commercial and Residential Neighborhoods

FISCAL IMPACT: The proposed hotel is expected to open in the Summer of 2024 and is projected to have an occupancy rate of 83 percent. The hotel is estimated to generate approximately $3.5 million dollars in revenue the first year and $4.5 million by the fifth year. Based on the projected revenues, the project will generate approximately $411,250 in estimated transient occupancy tax revenue the first year and $528,750 by the fifth year. In addition, the project will generate approximately $ 2.1 million in Development Impact Fees. Moreover, the project will also result in increased property tax revenues.

BACKGROUND & ANALYSIS: On June 4, 2021, the Applicant submitted a Conditional Use Permit application (File No. PCUP21-009) requesting approval to establish and operate a 128-room limited-service hotel on 1.83 acres of land located at 5060 East Fourth Street, within the Freeway Commercial land use district of The Exchange Specific Plan. The Conditional Use Permit was filed in conjunction with a Development Plan application (File No. PDEV21-021) requesting approval to construct a 4-story, 128-room Extended Stay hotel on the Project site.

On February 22, 2022, the Planning Commission conducted a duly noticed public hearing to consider the proposed Conditional Use Permit and Development Plan and upon conclusion of the

hearing, voted unanimously (7-0) to approve the Development Plan and recommend that the City Council approve the Conditional Use Permit.

The City's Development Code requires that all new hotels must be reviewed under concurrently filed Conditional Use Permit and Development Plan applications and that the Conditional Use Permit requires City Council action. The purpose of the Conditional Use Permit application and review is to confirm compliance with the City's Development Code required minimum amenity package for hotels, and to ensure the project's market feasibility.

Minimum Amenity Package. The Development Code provides that no Conditional Use Permit shall be approved for a hotel, motel, residence inn, or other similar traveler accommodation, unless certain specific amenities are provided, as follows:

- Each guestroom must include voicemail, wired or wireless internet access, desk with chair, hairdryer, retractable magnifying (10X) and lighted makeup mirror, iron and ironing board, high definition television, and alarm clock or wake-up service. Compliance with these requirements will be verified by the Planning Department during building plan check and at time of final building inspection.
- For limited-service hotels, meeting space equal to 15 square feet per guestroom must be provided, requiring the Project provide a minimum of 1,920 square feet of meeting/gathering area. The Project exceeds the minimum requirement, incorporating a total of 2,250 square feet of available meeting/gathering area.
- Both active and passive leisure amenities are required. At a minimum, the Project must provide a swimming pool, whirlpool/spa or furnished cabana, and fitness room. The Project exceeds the minimum requirement, providing a pool and spa, poolside cabana, outdoor seating areas, and a fitness room.
- A guest courtesy lounge for the serving of light meals and snacks is required to be provided in conjunction with limited-service hotels. The Project has provided a 331-square-foot café/snack room for hotel guests, meeting the minimum requirement.

In reviewing the proposed Project, the Planning Commission determined that all of the minimum amenity package requirements stipulated by Section 5.03.250.D (Minimum Amenity Package) of the City's Development Code, have been met or exceeded.

Market Demand. As a requirement of Conditional Use Permit submittal, the developer of a hotel must submit a Market Feasibility Study, which demonstrates that the local market can support the development of a new hotel. Veritas Development Advisors has prepared a Market Feasibility Study (dated October 21, 2021), which includes analysis and market research related to the proposed Project. The study found that the local market can support a limited-service hotel on the Project site. The study's conclusions are based primarily upon the growth in the Inland Empire, the area's proximity to the Los Angeles area, the Ontario Convention Center, the Ontario International Airport, California Speedway in Fontana, and the Project's proximity to the Ontario Mills Mall (see Exhibit K - Hotel Market Study, of the attached Planning Commission Staff Report). The Market Study includes an analysis of other similar hotels in the area, long-term viability, and overall demand due to new businesses and activities in and around the City.

HOUSING ELEMENT COMPLIANCE: The Project is consistent with the Housing Element of the Policy Plan (General Plan) component of The Ontario Plan, as the Project site is not one of the properties in the Available Land Inventory contained in Table A-3 (Available Land by Planning Area) of the Housing Element Technical Report Appendix.

AIRPORT LAND USE COMPATIBILITY PLAN (ALUCP) COMPLIANCE: The project site is located within the Airport Influence Area of the Ontario International Airport and has been found to be consistent with the policies and criteria set forth within the Ontario International Airport Land Use Compatibility Plan.

ENVIRONMENTAL REVIEW: The Project is categorically exempt from the requirements of the California Environmental Quality Act ("CEQA") pursuant to Section 15332 (Class 32, Infill Development Projects) of the CEQA Guidelines, which consists of projects characterized as infill development projects. Furthermore, the Project meets all of the following conditions: (a) the Project is consistent with the applicable general plan designation and all applicable general plan policies, as well as the applicable zoning designation and regulations; (b) the proposed development occurs within city limits, on a project site of no more than five acres, and is substantially surrounded by urban uses; (c) the Project site has no value as habitat for endangered, rare, or threatened species; (d) approval of the Project will not result in any significant effects relating to traffic, noise, air quality, or water quality; and (e) the Project site is adequately served by all required utilities and public services.

CITY OF ONTARIO PLANNING DEPARTMENT

PLANNING COMMISSION STAFF REPORT

February 22, 2022

303 East B Street, Ontario, California 91764 Phone: 909.395.2036 / Fax: 909.395.2420

FILE NOS: PCUP21-009 and PDEV21-021

SUBJECT: A Conditional Use Permit (File No. PCUP21-009) to establish and operate a limited-service hotel and a Development Plan (File No. PDEV21-021) to construct a 4-story, 128-room Extended Stay hotel on 1.83 acres of land located at 5060 East Fourth Street, within the Freeway Commercial land use district of The Exchange Specific Plan (APN: 0238-012-30); submitted by Roger Barbosa. City Council action is required for File No. PCUP21-009.

PROPERTY OWNER: Jara Hospitality

RECOMMENDED ACTION: That the Planning Commission consider and approve File No. PDEV21-021, and recommend approval to City Council for File No. PCUP21-009, pursuant to the facts and reasons contained in the staff report and attached resolutions, and subject to the conditions of approval contained in Attachment A to each resolution.

PROJECT SETTING: The Project site is comprised of 1.83 acres of land located at 5060 East Fourth Street, within the Freeway Commercial land use district of The Exchange Specific Plan and is depicted in Figure 1: Project Location. The site is bounded by Interstate 15 to the west, Fourth Street to the north, Southern California Edison ("SCE") transmission lines to the east and Ontario Mills Parkway to the south. The surrounding area is currently developed with Arizona Tile, Baker's Drive-Thru Restaurant, AM/PM Service Station, a multi-tenant retail building that includes WaBa Grill, and a four-building industrial business park located within the southern portion of the specific plan. The existing surrounding land uses, zoning, and general plan and specific plan land use designations are summarized in the "Surrounding Zoning &

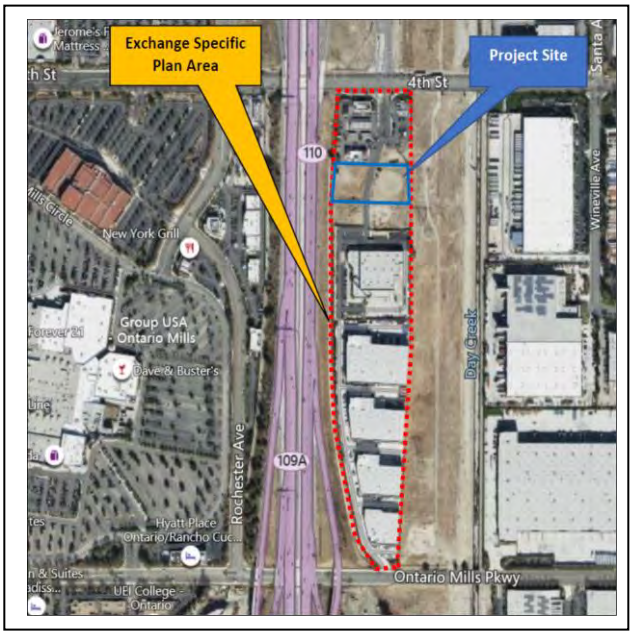


Figure 1: Project Location

Case Planner:	Luis E. Batres
Planning Director Approval:	
Submittal Date:	6/4/21

Hearing Body	*Date*	*Decision*	*Action*
DAB	2/7/22	Approved	Recommend
PC	2/22/22	Approved	Final /Recommend
CC			CUP- Final

Land Uses" table located in the Technical Appendix of this report.

PROJECT ANALYSIS:

(1) Background — In 2003, the City approved The Exchange Specific Plan, a 23.60-acre master plan for the Project area. The Exchange Specific Plan is composed of two land use districts, including the Freeway Commercial land use district, which comprises the northerly 12.03 acres of the Specific Plan, and the Industrial Park land use district, which comprises the southerly 11.57 acres of the Specific Plan (see Exhibit B—The Exchange Specific Plan Land Use Plan, attached).

In 2007, two development plans were approved within The Exchange Specific Plan master plan area, including a 15,705 square foot sit-down restaurant (Blue Sandias) and a 74-room, 3-story hotel (Candlewood Suites). Blue Sandias and Candlewood Suites were never constructed due to a downturn in the economy.

On June 4, 2021, the Applicant submitted a Conditional Use Permit application (File No. PCUP21-009) requesting approval to establish and operate a limited-service hotel land use, together with a Development Plan application (File No. PDEV21-021) requesting approval to construct a 4-story, 128-room Extended Stay hotel on the Project site.

Guest amenities proposed for the Project include:

- Swimming pool with an accompanying pool side cabana;
- Outdoor seating area;
- Porte-cochere for arriving guests;
- Meeting rooms (two rooms totaling 1,850 square feet) and adjacent outdoor gathering area (400 square feet);
- Fitness room (331 square feet);
- Café/Snack room (331 square feet);
- Guest laundry facilities (437 square feet); and
- On-site business center, including office equipment (copying, printer, and scanner) and supplies

Guestrooms range from 277 square feet (Queen Suites) to 432 square feet (Double Queen Suites) in area. Four room configurations are proposed:

- Queen Suites (61 rooms)
- Double Queen Suites (61 rooms)
- ADA Queen Suites (3 rooms)
- ADA Double Queen Suites (3 rooms)

(2) Conditional Use Permit — The City's Development Code requires that all new hotels must be reviewed under concurrently filed Conditional Use Permit and Development Plan applications. The purpose of the Conditional Use Permit application

and review is to ensure that the proposed use will be operated in a manner consistent with all local regulations, and to ensure the use will not be detrimental to the public health, safety, or welfare, or materially injurious to uses, properties or improvements in the vicinity. More specifically, in the case of hotels, the Conditional Use Permit is required to establish the Project's market feasibility and ensure on-going compliance with the minimum amenity package required by the Development Code.

(a) Market Demand — As a requirement of Conditional Use Permit submittal, the developer of a hotel must submit a Market Feasibility Study, which demonstrates that the local market can support the development of a new hotel. For this Application, Veritas Development Advisors has prepared a Market Feasibility Study (dated October 21, 2021), which includes analysis and market research related to the proposed Project. The study found that the local market can support a limited-service hotel on the Project site. The study's conclusions are based primarily upon the growth in the Inland Empire, the area's proximity to the Los Angeles area, the Ontario Convention Center, the Ontario International Airport, California Speedway in Fontana, and the Project's proximity to the Ontario Mills Mall (see Exhibit K—Hotel Market Study, attached). The Market Study includes an analysis of other similar hotels in the area, long-term viability, and overall demand due to new businesses and activities in and around the City.

(b) Minimum Amenity Package —The Development Code provides that no Conditional Use Permit shall be approved for a hotel, motel, residence inn, or other similar traveler accommodation, unless certain specific amenities are provided, as follows

- Each guestroom must include voicemail, wired or wireless internet access, desk with chair, hairdryer, retractable magnifying (10X) and lighted makeup mirror, iron and ironing board, high definition television, and alarm clock or wake-up service. Compliance with these requirements will be verified by the Planning Department during Building Department plan check and at time of final building inspection.
- For limited-service hotels, meeting space equal to 15 square feet per guestroom must be provided, requiring that a minimum of 1,920 square feet of meeting/gathering area must be provided for the Project. The Project exceeds the minimum requirement, incorporating a total of 2,250 square feet of available meeting/gathering area.
- Both active and passive leisure amenities are required, at a minimum, a swimming pool, whirlpool/spa or furnished cabana, and fitness room. The Project exceeds the minimum requirement, providing a pool/spa, poolside cabana, outdoor seating areas, and a fitness room.
- A guest courtesy lounge for the serving of light meals and snacks is required to be provided in conjunction with limited-service hotels. A 331-square-foot café/snack room is provided for hotel guests, meeting the minimum requirement.

It is the determination of Planning Department staff that the proposed Project has met or exceeded the minimum amenity package requirements, as stipulated by Section 5.03.250.D (Minimum Amenity Package) of the City's Development Code.

(3) Development Plan —

(a) Site Design/Building Layout. The proposed hotel is located approximately 1,000 feet south of Fourth street, with the building's primary entrance facing north. The building is in a L-shaped configuration, which wraps around an outdoor amenity area containing the pool/spa and outdoor gathering/seating areas (see Exhibit A—Project Location Map, attached).

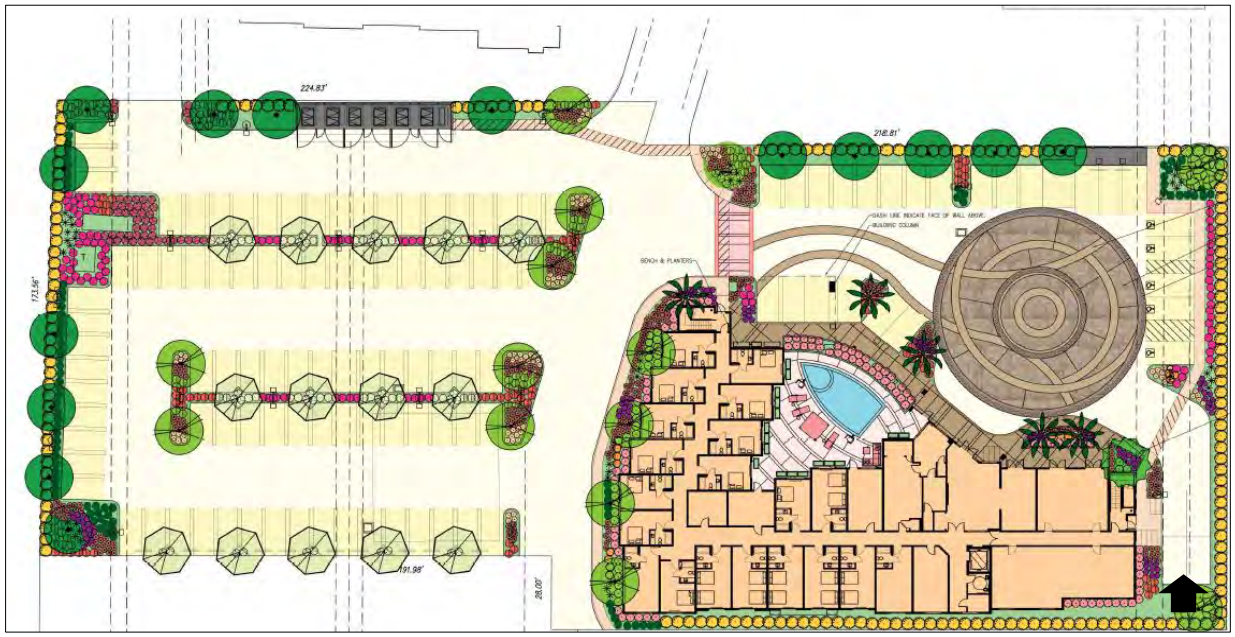


Figure 2: Site Plan

(b) Site Access/Circulation. Off-street parking is distributed along the north and west sides of the building and a guest drop-off area under a porte-cochere has been provided at the front of the building. Ample landscaped areas have been provided immediately adjacent to the hotel and throughout the off-street parking areas. Additionally, decorative hardscape treatments have been provided at the main building entrance, throughout the pool/spa and outdoor gathering/seating areas and at the vehicle turn-around area in front of the hotel (see Figure 2: Site Plan, above).

(c) Site Access/Circulation. Primary vehicular access to the proposed hotel is provided from an existing common drive aisle that intersects Fourth Street at a fully signalized intersection that is common with the Interstate 15 southbound exit to Fourth Street. Secondary access is provided from Ontario Mills Parkway via a common drive aisle through the industrial park to the south. Additionally, ample maneuvering space has been provided for service. Service vehicles will be able to access the hotel along the east side of the building via a 24-foot-wide service drive.

(d) Parking. The Project is required to provide a total of 128 off-street parking spaces, at the rate of one space per guestroom, and the Project is proposing a total of 118 spaces. The Exchange Specific Plan and the Ontario Development Code allow the Planning Commission to approve a reduction in parking, if the reduction is validated by a parking study. To support the requested reduction in parking, a parking study was prepared by Trames Solutions Inc. (see Exhibit L—Parking Study, attached). The parking study concluded that the number of parking spaces provided is adequate. The study found that the hotel will have a peak demand of 94 spaces at 8 AM on weekdays and 105 spaces at 8 AM on weekends (see Table 1: Parking Study Peak Demand, below). In addition, the City's Traffic Manager has reviewed the parking study and is in support of the study's findings. However, to mitigate any potential parking shortages in the future, staff has conditioned the Project so that, if additional parking is found to be necessary, the Applicant must enter into a reciprocal parking agreement with adjacent developments to provide additional parking.

Table 1: Parking Study Peak Demand

Demand	*Peak Time*	*Required Parking*	*Parking Provided*
Weekdays:	8 AM	94	118
Weekends:	8 AM	105	118

(e) Architecture. The Extended Stay hotel will be a signature building. The hotel will feature a contemporary architecture style that exemplifies the high-quality architecture promoted by The Exchange Specific Plan and the Ontario Plan. Since the Project will be visible from all four sides, staff has worked closely with the architect to provide 360-degree architecture. Special attention has been given to the use of colors, massing, building form, materials, and architectural details (see Figure 3: Front Elevation, below, and Exhibit F—Building Elevations, attached).

This is exemplified by the use of:

- Decorative architectural towers on all four building sides;
- Articulated roof line;
- Articulated footprint;
- Decorative cornice treatment along the edge of the architectural towers;
- Vertical and horizontal reveal lines;
- Variation in building massing;
- Cantilevered building elements;
- Incorporation of insets and pop-outs;
- Extensive use of glass;
- Smooth-painted walls;
- Decorative lighting fixtures;
- Fiber cement vertical siding panels;
- Decorative metal wall panels;

- Decorative painted steel canopies along the north elevation;
- Incorporation of a stone veneer along the full height of the first floor (French Limestone);
- Incorporation of decorative eyebrows over key windows; and
- Color blocking implementing exterior colors of varying tone, shade, and brightness.

Figure 3: Front (North) Elevation

(f) Landscaping. The Exchange Specific Plan requires 15 percent of the site to be landscaped and the Applicant proposes to landscape 15.5 percent of the Project site. Palm trees, accent trees, and ground cover have been selected to enhance the Project site, along with Australian Willow, Brisbane Box, Coast Live Oak, Date Palms, Agave Blue Clone, Dwarf Myrtle, Amazing Red Flax, Indian Hawthorn, Texas Privet, and Orange Drop Lily. To enhance the Project at night, staff has worked with the Applicant to also provide enhanced lighting at key landscape areas.

(g) Utilities (drainage, sewer). Public utilities (water and sewer) are available to serve the Project site. Additionally, the applicant has submitted a Preliminary Water Quality Management Plan ("PWQMP"), which establishes the Project's compliance with storm water discharge/water quality requirements. The PWQMP includes site design measures that capture runoff and pollutant transport by minimizing impervious surfaces and maximizes low impact development ("LID") best management practices ("BMPs"), such as retention and infiltration, bio treatment, and evapotranspiration. The PWQMP proposes an underground infiltration basin located beneath the parking lot, along the west of the hotel structure. The basin is designed to accept runoff from the building's roof and parking lot.

COMPLIANCE WITH THE ONTARIO PLAN: The proposed Project is consistent with the principles, goals and policies contained within the Vision, Governance, Policy Plan (General Plan), and City Council Priorities components of The Ontario Plan (TOP). More specifically, the goals and policies of TOP that are furthered by the proposed Project are as follows:

(1) City Council Goals.

- Invest in the Growth and Evolution of the City's Economy
- Operate in a Businesslike Manner
- Focus Resources in Ontario's Commercial and Residential Neighborhoods

(2) Vision.

Distinctive Development:

- Commercial and Residential Development

➢ Development quality that is broadly recognized as distinctive and not exclusively tied to the general suburban character typical of much of Southern California.

(3) Governance.

Decision Making:

- Goal G1: Sustained decision-making that consistently moves Ontario towards its Vision by using The Ontario Plan as a framework for assessing choices.

➢ G1-2 Long-term Benefit. We require decisions to demonstrate and document how they add value to the community and support the Ontario Vision

(4) Policy Plan (General Plan)

Land Use Element:

- Goal LU2: Compatibility between a wide range of uses.

➢ LU2-6: Infrastructure Compatibility: We require infrastructure to be aesthetically pleasing and in context with the community character.

Community Economics Element:

- Goal CE2: A City of distinctive neighborhoods, districts, and corridors, where people choose to be.

➢ CE2-1 Development Projects. We require new development and redevelopment to create unique, high-quality places that add value to the community.

➢ CE2-2 Development Review. We require those proposing new development and redevelopment to demonstrate how their projects will create

appropriately unique, functional, and sustainable places that will compete well with their competition within the region.

- CE2-4 Protection of Investment. We require that new development and redevelopment protect existing investment by providing architecture and urban design of equal or greater quality.

- CE2-5 Private Maintenance. We require adequate maintenance, upkeep, and investment in private property because proper maintenance on private property protects property values.

- Goal CE3: Decision-making deliberations that incorporate the full short-term and long-term economic and fiscal implications of proposed City Council actions.

- CE3-1 Fiscal Impact Disclosures. We require requests for City Council action to disclose the full fiscal impacts, including direct and indirect costs.

Safety Element:

- Goal S1: Minimized risk of injury, loss of life, property damage and economic and social disruption caused by earthquake-induced and other geologic hazards.

- S1-1 Implementation of Regulations and Standards. We require that all new habitable structures be designed in accordance with the most recent California Building Code adopted by the City, including provisions regarding lateral forces and grading.

Community Design Element:

- Goal CD1: A dynamic, progressive city containing distinct neighborhoods and commercial districts that foster a positive sense of identity and belonging among residents, visitors, and businesses.

- CD1-1 City Identity. We take actions that are consistent with the City being a leading urban center in Southern California while recognizing the diverse character of our existing viable neighborhoods.

- CD1-2 Growth Areas. We require development in growth areas to be distinctive and unique places within which there are cohesive design themes.

- CD1-3 Neighborhood Improvement. We require viable existing residential and non-residential neighborhoods to be preserved, protected, and enhanced in accordance with our land use policies.

- Goal CD2: A high level of design quality resulting in public spaces, streetscapes, and developments that are attractive, safe, functional, and distinct.

➢ CD2-1 Quality Architecture. We encourage all development projects to convey visual interest and character through:

- Building volume, massing, and height to provide appropriate scale and proportion;
- A true architectural style which is carried out in plan, section, and elevation through all aspects of the building and site design and appropriate for its setting; and
- Exterior building materials that are visually interesting, high quality, durable, and appropriate for the architectural style.

➢ CD2-8 Safe Design. We incorporate defensible space design into new and existing developments to ensure the maximum safe travel and visibility on pathways, corridors, and open space and at building entrances and parking areas by avoiding physically and visually isolated spaces, maintenance of visibility and accessibility, and use of lighting.

➢ CD2-9 Landscape Design. We encourage durable landscaping materials and designs that enhance the aesthetics of structures, create, and define public and private spaces, and provide shade and environmental benefits.

➢ CD2-10 Surface Parking Areas. We require parking areas visible to or used by the public to be landscaped in an aesthetically pleasing, safe and environmentally sensitive manner. Examples include shade trees, pervious surfaces, urban run-off capture and infiltration, and pedestrian paths to guide users through the parking field.

➢ CD2-11 Entry Statements. We encourage the inclusion of amenities, signage, and landscaping at the entry to neighborhoods, commercial centers, mixed use areas, industrial developments, and public places that reinforce them as uniquely identifiable places.

➢ CD2-12 Site and Building Signage. We encourage the use of sign programs that utilize complementary materials, colors, and themes. Project signage should be designed to effectively communicate and direct users to various aspects of the development and complement the character of the structures.

➢ CD2-13 Entitlement Process. We work collaboratively with all stakeholders to ensure a high degree of certainty in the efficient review and timely processing of all development plans and permits.

▪ Goal CD3: Vibrant urban environments that are organized around intense buildings, pedestrian and transit areas, public plazas, and linkages between and within developments that are conveniently located, visually appealing and safe during all hours.

- CD3-1 Design. We require that pedestrian, vehicular, bicycle and equestrian circulation on both public and private property be coordinated and designed to maximize safety, comfort, and aesthetics.

- CD3-2 Connectivity Between Streets, Sidewalks, Walkways and Plazas. We require landscaping and paving be used to optimize visual connectivity between streets, sidewalks, walkways, and plazas for pedestrians.

- CD3-3 Building Entrances. We require all building entrances to be accessible and visible from adjacent streets, sidewalks, or public open spaces.

- CD3-5 Paving. We require sidewalks and road surfaces to be of a type and quality that contributes to the appearance and utility of streets and public spaces.

- CD3-6 Landscaping. We utilize landscaping to enhance the aesthetics, functionality and sustainability of streetscapes, outdoor spaces, and buildings.

- Goal CD5: A sustained level of maintenance and improvement of properties, buildings and infrastructure that protects the property values and encourages additional public and private investments.

- CD5-1 Maintenance of Buildings and Property. We require all public and privately-owned buildings and property (including trails and easements) to be properly and consistently maintained.

- CD5-2 Maintenance of Infrastructure. We require the continual maintenance of infrastructure.

HOUSING ELEMENT COMPLIANCE: The Project is consistent with the Housing Element of the Policy Plan (General Plan) component of The Ontario Plan, as the Project site is not one of the properties in the Available Land Inventory contained in Table A-3 (Available Land by Planning Area) of the Housing Element Technical Report Appendix.

AIRPORT LAND USE COMPATIBILITY PLAN (ALUCP) COMPLIANCE: The California State Aeronautics Act (Public Utilities Code Section 21670 et seq.) requires that an Airport Land Use Compatibility Plan be prepared for all public use airports in the State; and requires that local land use plans and individual development proposals must be consistent with the policies set forth in the adopted Airport Land Use Compatibility Plan. On April 19, 2011, the City Council of the City of Ontario approved and adopted the Ontario International Airport Land use Compatibility Plan ("ALUCP"), establishing the Airport Influence Area for Ontario International Airport, which encompasses lands within parts of San Bernardino, Riverside, and Los Angeles Counties, and limits future land uses and development within the Airport Influence Area, as they relate to noise, safety, airspace protection, and overflight impacts of current and future airport activity. The proposed Project is located within the Airport Influence Area of Ontario International Airport and was evaluated and

found to be consistent with the policies and criteria of the ALUCP. Any special conditions of approval associated with uses in close proximity to the airport are included in the conditions of approval provided with the attached Resolution.

ENVIRONMENTAL REVIEW: The Project is categorically exempt from the requirements of the California Environmental Quality Act ("CEQA") pursuant to Section 15332 (Class 32, Infill Development Projects) of the CEQA Guidelines, which consists of projects characterized as infill development projects. Furthermore, the Project meets all of the following conditions: (a) the Project is consistent with the applicable general plan designation and all applicable general plan policies, as well as the applicable zoning designation and regulations; (b) the proposed development occurs within city limits, on a project site of no more than five acres, and is substantially surrounded by urban uses; (c) the Project site has no value as habitat for endangered, rare, or threatened species; (d) approval of the Project will not result in any significant effects relating to traffic, noise, air quality, or water quality; and (e) the Project site is adequately served by all required utilities and public services.

CONDITIONS OF APPROVAL: See attached department reports.

TECHNICAL APPENDIX:

Surrounding Zoning and Land Use:

	Existing Land Use	*General Plan Designation*	*Zoning Designation*	*Specific Plan Land Use*
Site	Vacant	Planned Commercial	SP (Specific Plan)	The Exchange SP / Freeway Commercial
North	Multi-tenant retail & Vacant Land	Planned Commercial	SP (Specific Plan)	The Exchange SP / Freeway Commercial
South	Vacant Land	Planned Commercial	SP (Specific Plan)	The Exchange SP / Freeway Commercial
East	SCE Transmission Lines	Non-Recreational Open Space	Open Space (OS)	N/A
West	I-15 Freeway	Right-of-way	Right-of-way	N/A

General Site & Building Statistics

Item	*Proposed*	*Min./Max. Standard*	*Meets Y/N*
Project Area:	1.83 Acres	N/A	Y
Lot/Parcel Size:	1.83 Acres	N/A	Y
Building Area:	56,406 Sq. Ft.	N/A	Y
Building Height:	53'	55'	Y

Off-Street Parking:

Type of Use	*Building Area*	*Parking Ratio*	*Spaces Required*	*Spaces Provided*
Hotel (128 Rooms)	56,406 Sq. Ft.	1 Space per Guest Room	128	118
		Note: Per Parking Study Prepared	105	118
TOTAL			105	118

Exhibit A—PROJECT LOCATION MAP

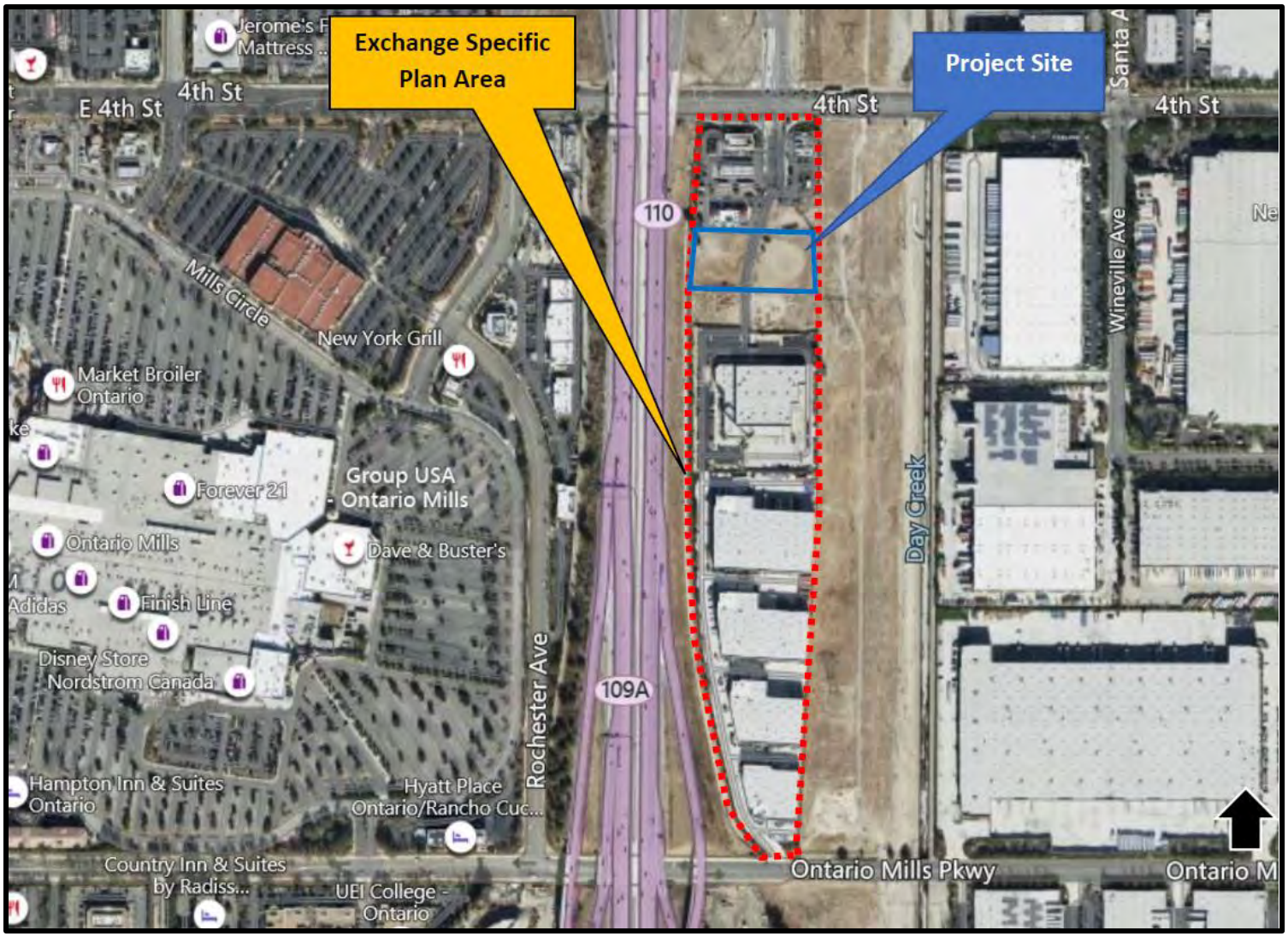


Exhibit B—THE EXCHANGE SPECIFIC PLAN LAND USE PLAN

Exhibit C—SITE PLAN

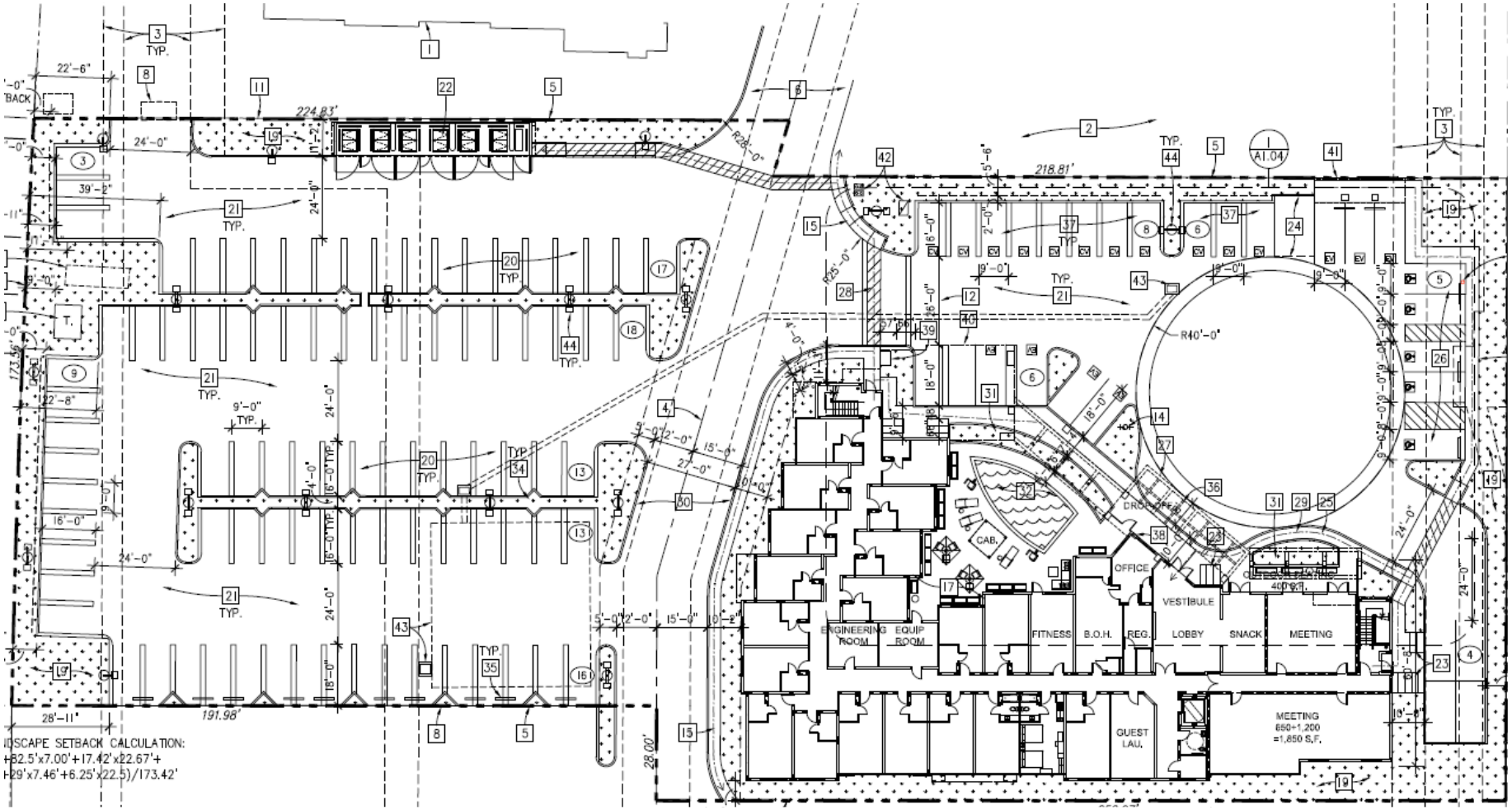


Exhibit D—LANDSCAPE PLAN

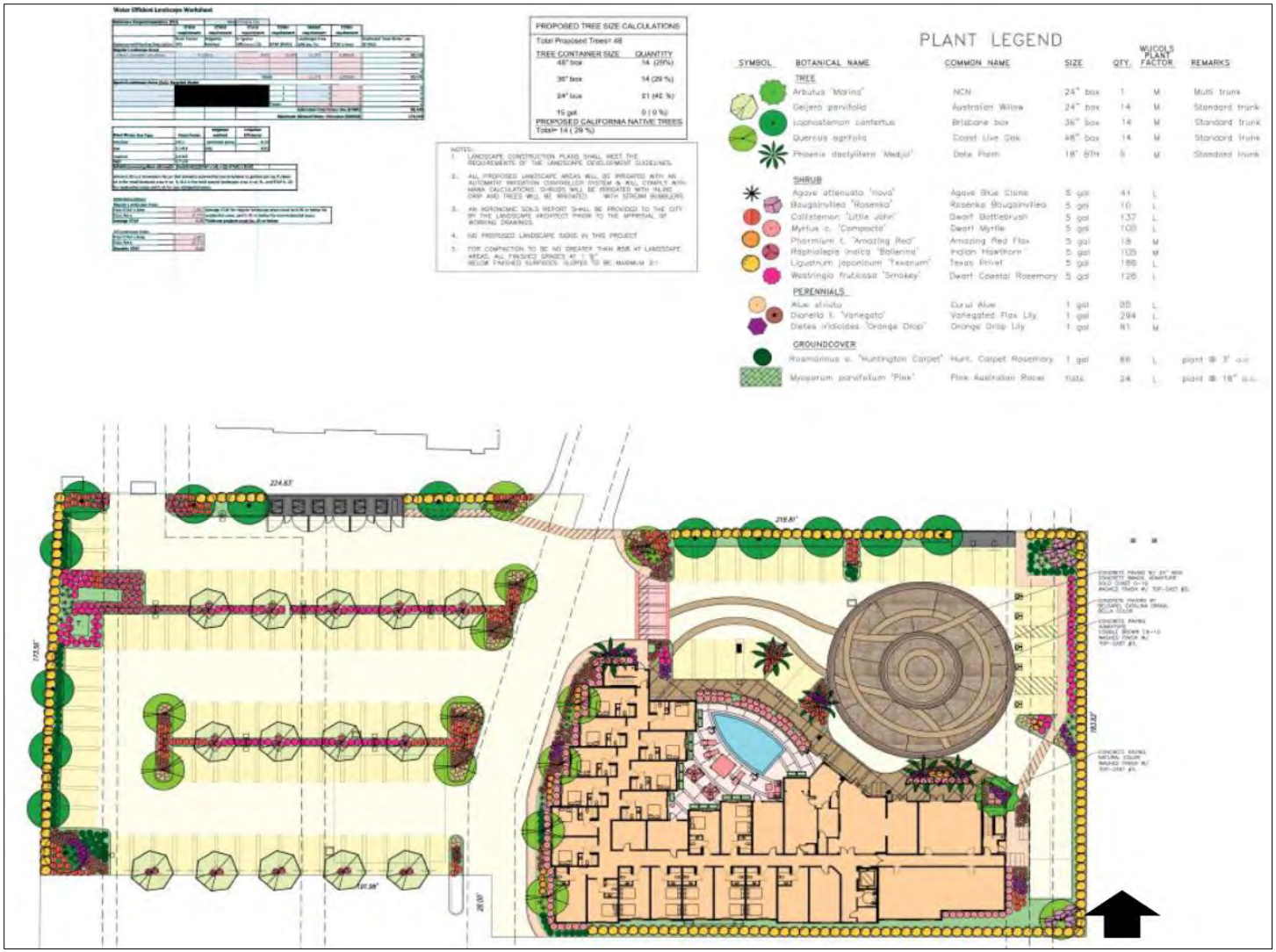


Exhibit E—POOL AREA

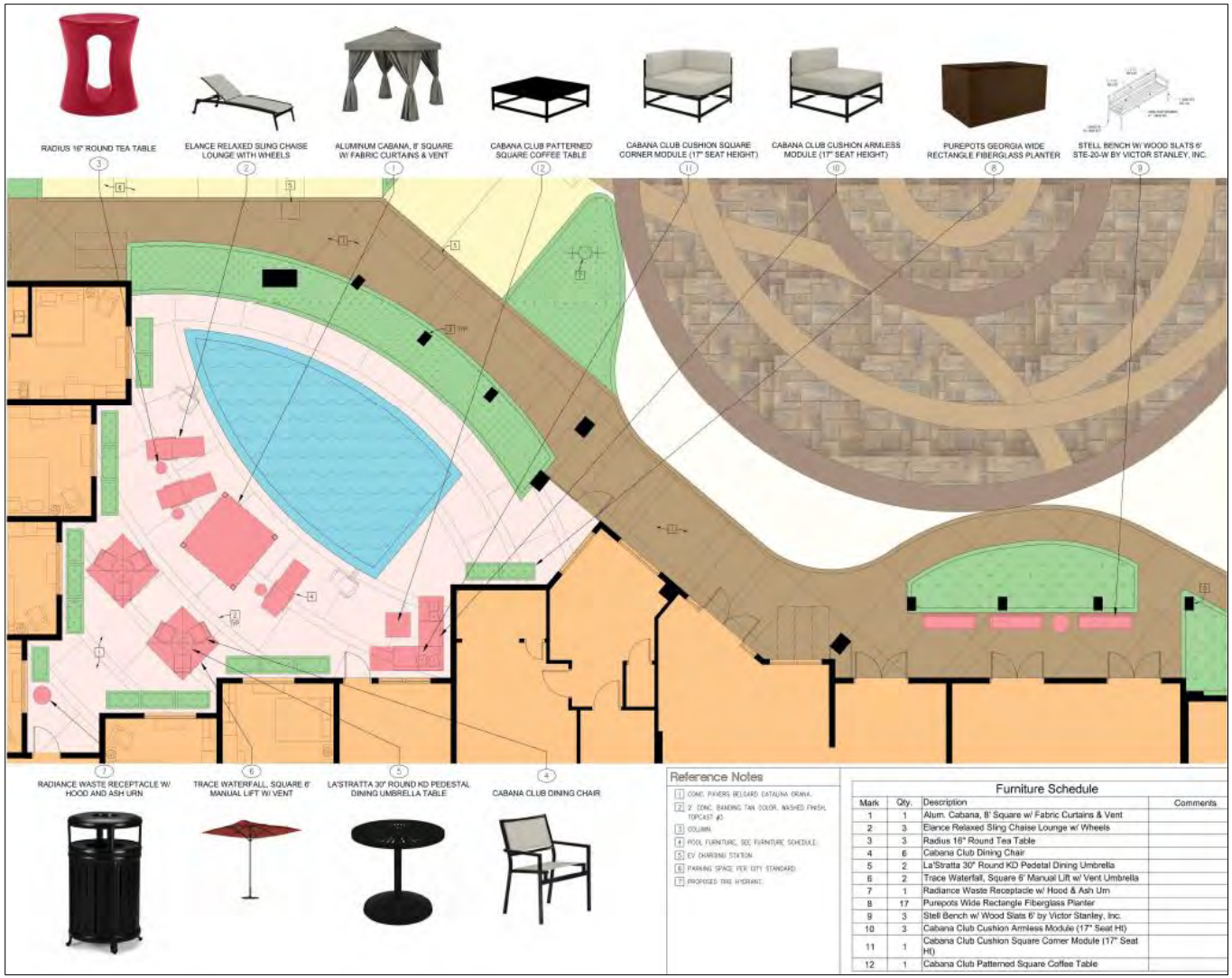


Exhibit F—EXTERIOR ELEVATIONS

North Elevation

South Elevation

Exhibit F—EXTERIOR ELEVATIONS (CONTINUED)

West Elevation

East Elevation

Exhibit G—FIRST FLOOR

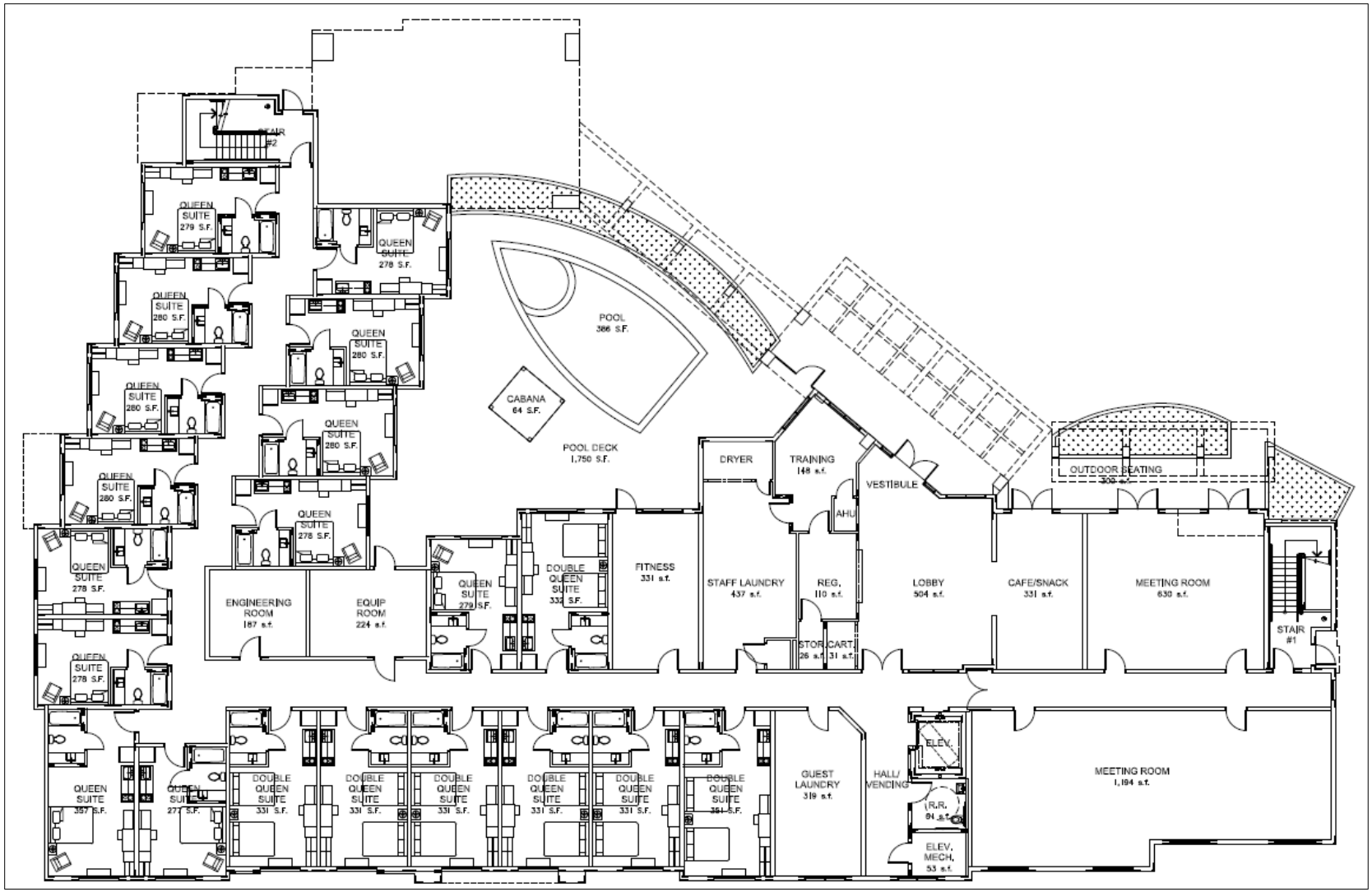


Exhibit H—SECOND FLOOR

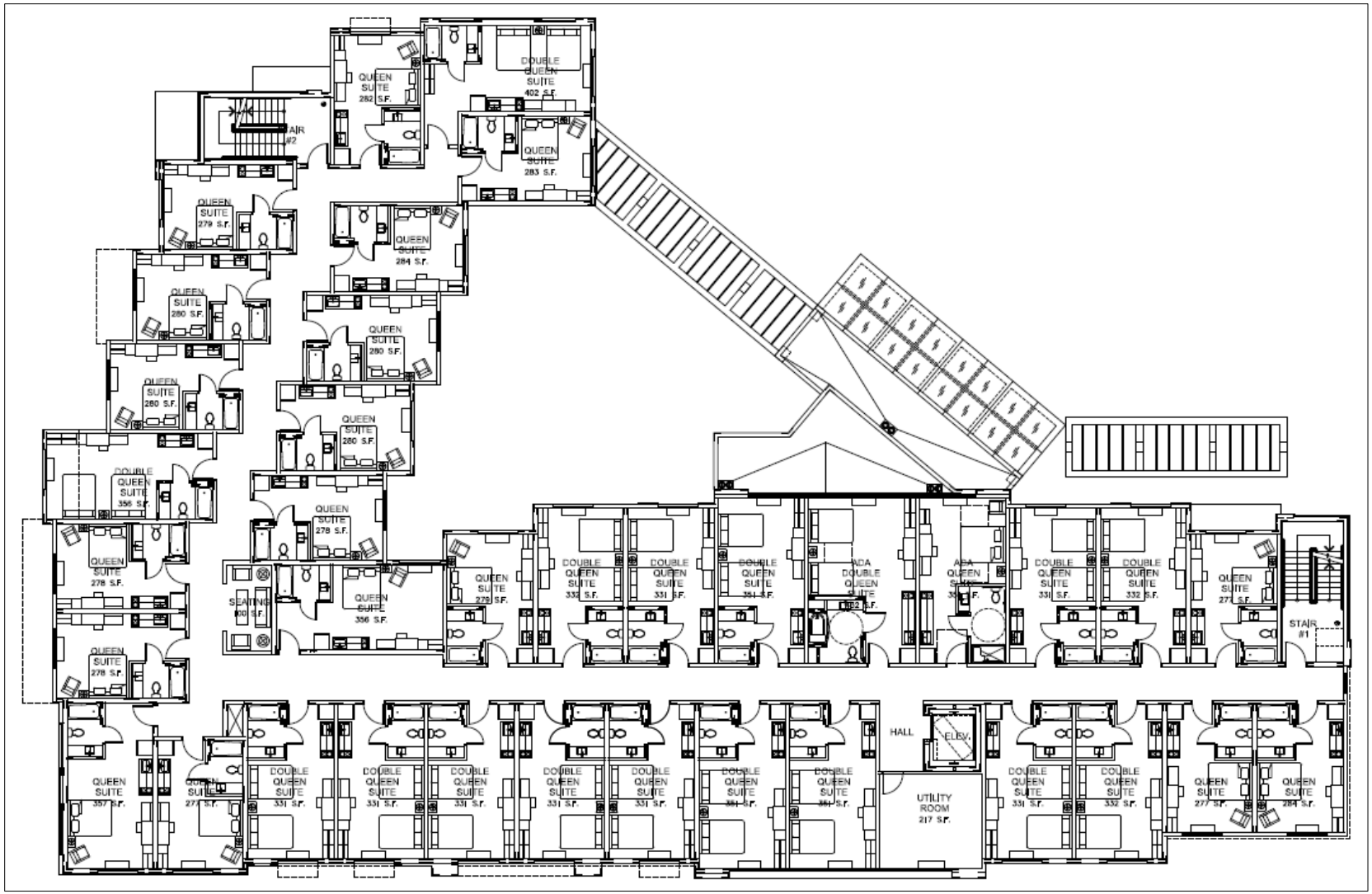


Exhibit I—THIRD FLOOR

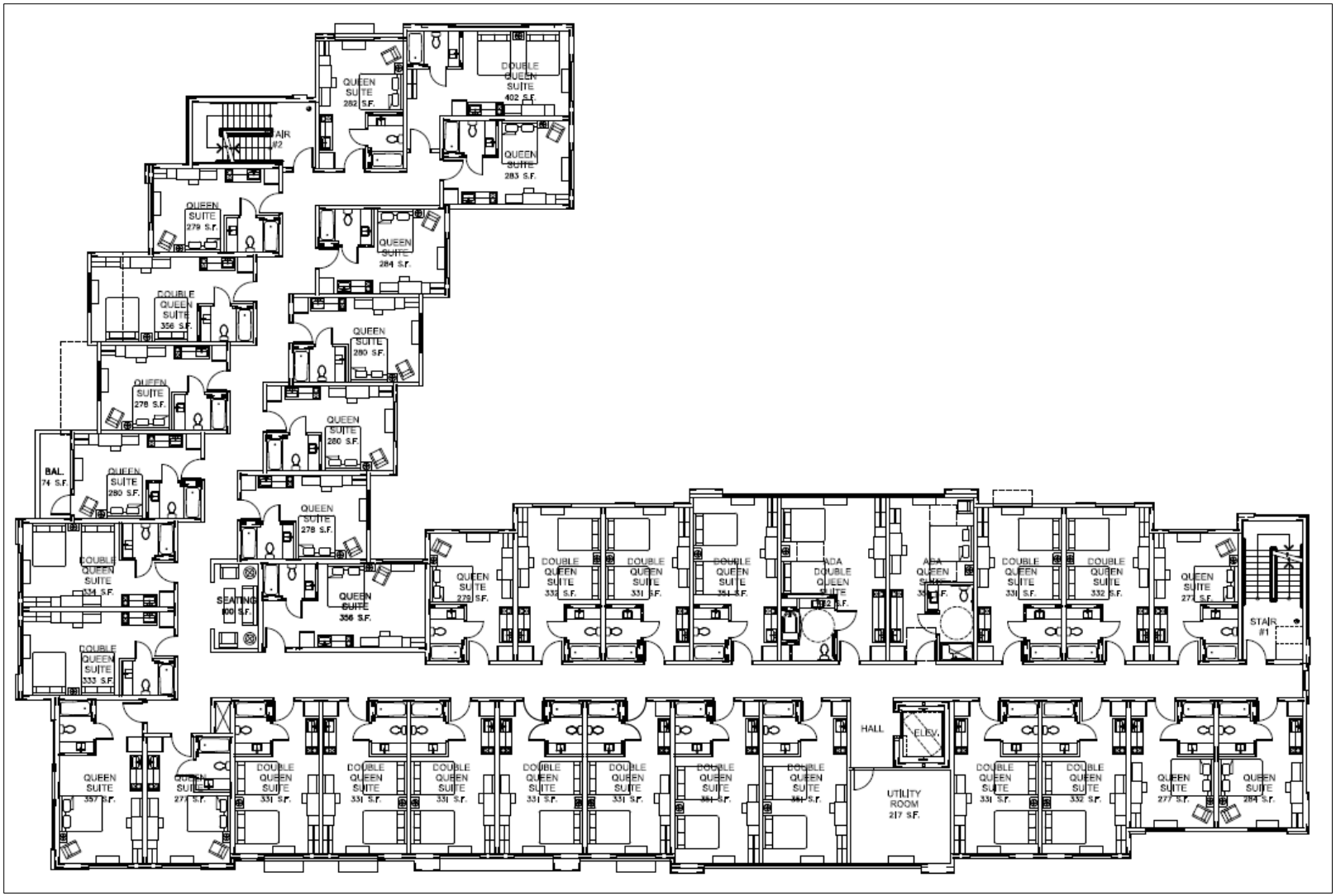


Exhibit J—FOURTH FLOOR

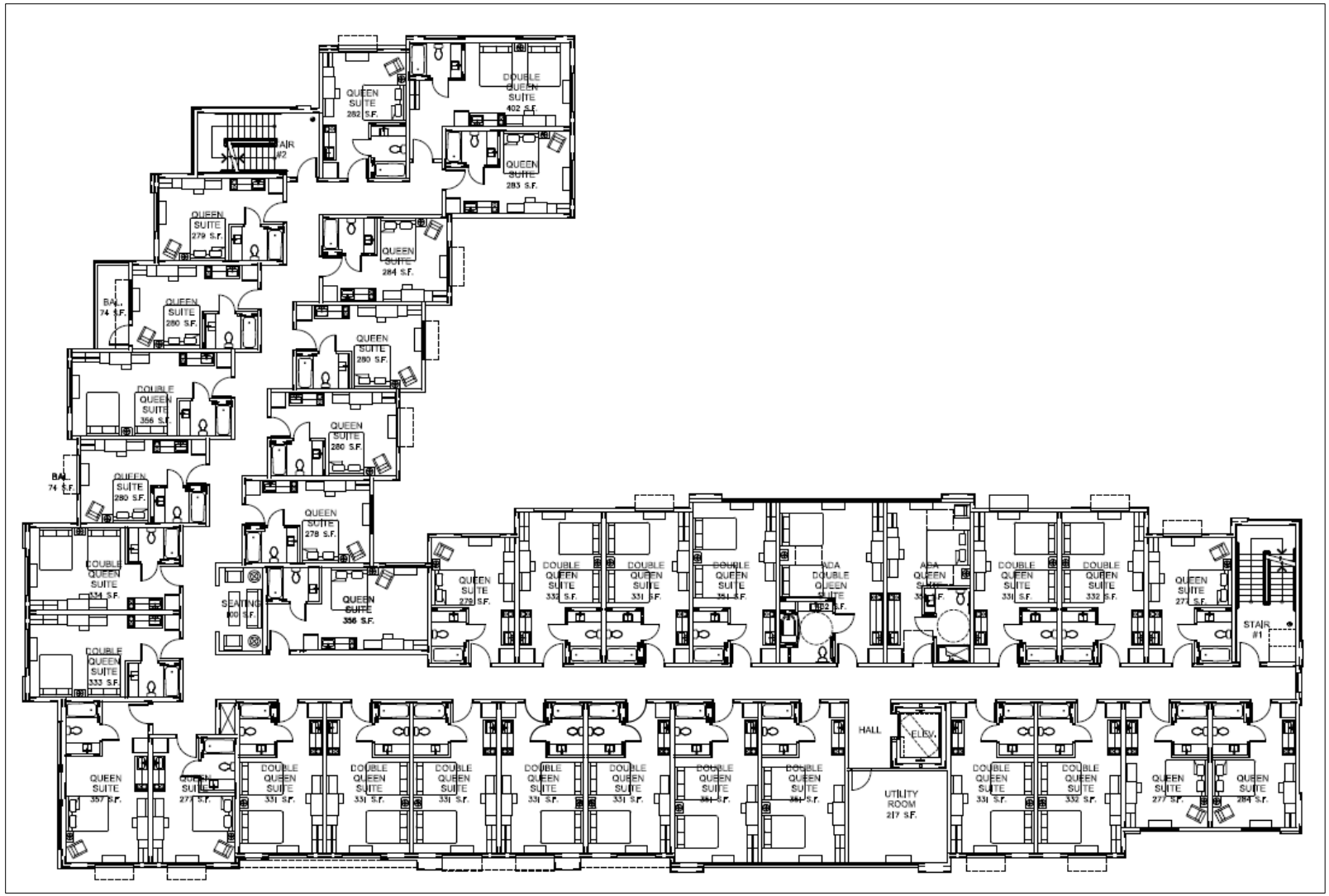


Exhibit K—HOTEL MARKET STUDY

(Document follows this page)

October 21, 2021

VERITAS | DEVELOPMENT ADVISORS

Market Feasibility Study

for the planned construction and operation of a 128-room extended stay hotel to be located in Ontario, CA

3521

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The report and analysis does not purport to represent a formal valuation of any land or property interest and must not be construed as such. Such analysis including forward looking statements are opinions and estimates only and are based on a wide range of variables which may not be capable of being determined with accuracy. Variation in any one of these variables can have a material impact on the analysis and we draw your attention to this.

It should be noted that the estimation of future sales prices, rental levels, development and investment returns and development viability is a very problematic exercise which at best should be regarded as an indicative assessment of possibilities rather than absolute values. The process of making forward projections for such key elements involves assumptions which are acutely sensitive to changing conditions, variations in any one of which factors may significant effect the viability of a project and we draw your attention to this factor. Veritas Development Advisors, LLC does not accept any liability for negligence or otherwise for any loss or damage suffered by any party resulting from reliance on this report other than as specified in the contract of engagement.

Effect of global and local economic conditions

The continued turmoil and instability in the financial markets is continuing to cause volatility and uncertainty in the world's capital markets and real estate markets. In these circumstances the assessment or feasibility may be affected by rapidly changing global and local economic market conditions, socio-economic changes, political conditions and other risks.

Availability and Cost of Finance

Due to the current situation of the global and local capital markets, interest rates have been volatile there has been a significant reduction in the availability of and increase in the cost of debt to the real estate sector and the mortgage market.

Supply & Demand Analysis

The supply and demand analyses set out in the report are based on current and historic trends and may be impacted significantly by factors such as unforeseen delays in supply, decreasing demand levels and changes in investor, business and consumer sentiment as well as the outlook for economic growth at local, regional and global levels.

Demand in the Market Area

Currency volatility together with job security, economic growth changing oil prices and deteriorating employment conditions across much of the globe may impact the propensity to travel and affect the purchasing power of prospective visitors to the region. This is likely to materially impact the performance of the hospitality and retail sector in particular.

Veritas Development Advisors, LLC does not accept any liability for any changes in the market conditions which may have occurred in the time elapsed between the rendering of the report and the use of it. Nor can Veritas Development Advisors, LLC accept any liability for discrepancies between our assumptions, which lie at the basis of the report, and actual market conditions which are not available to any qualified real estate consultant as a result of the market's inherent limited transparency.

Executive Summary

VERITAS | DEVELOPMENT ADVISORS

Executive Summary

VERITAS | DEVELOPMENT ADVISORS

October 21, 2021

Private and Confidential

Mr. Luis Batres, Senior Planner
City of Ontario ("Company")
303 East B Street
Ontario, California 91764

Re: Market Feasibility Study for the planned construction and operation of a 128-room extended stay hotel to be located at 5060 East 4th Street in Ontario, CA 91764. ("Subject Project").

Dear Mr. Batres:

The enclosed Market Feasibility Study is for the planned 128-room extended stay hotel to be located in Ontario, CA. Demand factors were analyzed in detail as presented herein. The Subject Project's industry and its relevant leveraged structure indicates that the Company's revenue should follow trends in the overall economy, including disposable income of end-users/consumers. Based on the analysis, the market area economy appears to be growing which indicates reasonable potential for the Subject Project.

The market area for the Subject Project appears stable. The Subject Project's rooms are expected to be absorbed in the market area based on the STR report analysis conducted herein. Based on the supply and demand analysis (pre-COVID) within the market area, it appears as though occupancy will likely remain above 65 percent over the next five years. Analyses of the market appears to indicate that development of the Subject Project, as planned, would yield about a 0.8 percent market share in the Subject Project's market area.

Primary and secondary research was used to carry out the analyses related to the Subject Project.

Steve Alves, Managing Partner
Veritas Development Advisors, LLC

Statement of Work

Scope of Work

// Market Feasibility Study //

1. A complete listing of proposed facilities, amenities, and services (i.e.: number and type of rooms, meeting space square footage, recreational amenities, business services such as data ports-workstations-etc., refrigerators in room, laundry service, restaurant-coffee shop-food service, etc.);
2. History of proposed developer and potential operators (i.e.: years in business, principals, capitalizing, experience, listing of projects, number of units owned, average rates charged, occupancy rates, etc.);
3. Analysis of economic environment projecting likely future economic conditions as they relate to the operation of the subject hotel;
4. Subjects competitive market (i.e.: identification of their market, 3 and 5 year history of occupancy- average daily rate-revenue per available room trends for that market, estimated share of the market the hotel will capture during the first five years of operation, etc.);
5. Analysis of the economic impacts on existing hotel markets within Ontario (i.e.: estimate of the dilution of the market due to addition of proposed hotel, etc.). Note: new hotel projects should only be approved if competitive market occupancy remains at or above 65 percent for a five year projection period;
6. Relationship to demand generators (i.e.: airport, convention center, corporate market, shopping and entertainment);
7. Public cost/revenue projections.

Market Feasibility Study

VERITAS | DEVELOPMENT ADVISORS

Market Feasibility

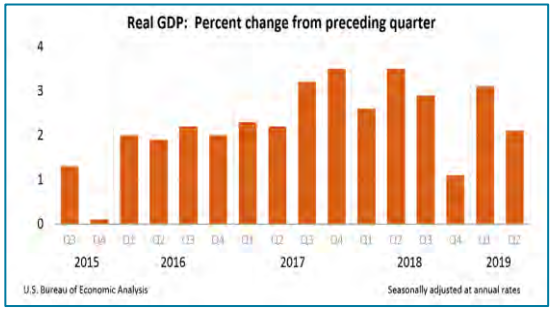
US Economy

Gross Domestic Product (GDP)

Current Numbers

- 2nd quarter 2019: 2.1 percent
- 1st quarter 2019: 3.1 percent

Real gross domestic product (GDP) increased at an annual rate of 2.1 percent in the second quarter of 2019, according to the "advance" estimate released by the Bureau of Economic Analysis. In the first quarter, real GDP increased 3.1 percent.



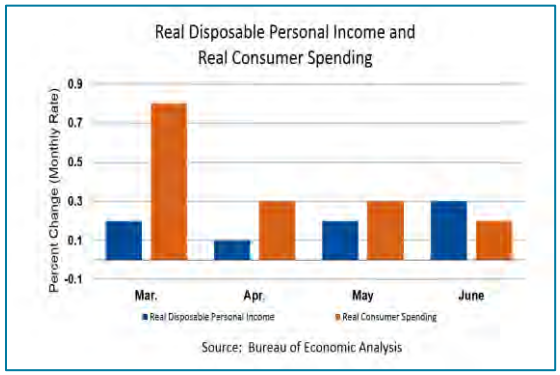
The Bureau emphasized that the third-quarter advance estimate released today is based on source data that are incomplete or subject to further revision by the source agency. The "second" estimate for the third quarter, based on more complete data, will be released on August 29, 2019.

Personal Income

- June 2019: 0.4 percent
- May 2019: 0.4 percent

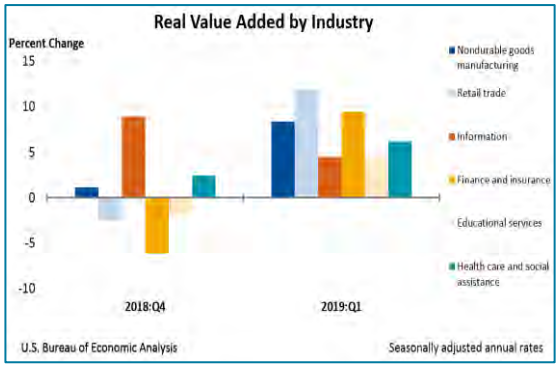
Personal income increased 0.4 percent in June, the same increase as in May. Wages and salaries, the largest component of personal income, increased 0.5 percent in June after increasing 0.2 percent in May.

Personal income increased $83.6 billion (0.4 percent) in June according to estimates released today by the Bureau of Economic Analysis. Disposable personal income (DPI) increased $69.7 billion (0.4 percent) and personal consumption expenditures (PCE) increased $41.0 billion (0.3 percent).



Industry Economic Accounts

Finance and insurance; retail trade; and health care and social assistance were the leading contributors to the increase in U.S. economic growth in the first quarter of 2019. Overall, 16 of 22 industry groups contributed to the 3.1 percent increase in real GDP in the first quarter. According to gross domestic product (GDP) by the Bureau of Economic Analysis, 16 of 22 industry groups contributed to the overall 3.1 percent increase in real GDP in the first quarter.



Market Feasibility

Retail trade increased 11.9 percent in the first quarter, after decreasing 2.5 percent in the fourth. This primarily reflected an increase in other retail, which includes gasoline stations and pharmacies and drug stores.

U.S. Balance of Payments (International Transactions)

Current Account Balance:

- 1st quarter 2019: -$130.4 billion
- 4th quarter 2018: -$143.9 billion
- Annual 2017: -$466.2 billion
- Annual 2016: -$451.7 billion

The U.S. current-account deficit decreased to $130.4 billion (preliminary) in the first quarter of 2019 from $143.9 billion (revised) in the fourth quarter of 2018.

International Investment Position

Net International Investment Position at End of Period:

- End of 1st quarter 2019: -$9.93 trillion
- End of 4th quarter 2018: -$9.55 trillion
- End of year 2018: -$9.55 trillion
- End of year 2017: -$7.74 trillion

Quarterly data: The U.S. net international investment position decreased to -$9.93 trillion (preliminary) at the end of the first quarter of 2019 from -$9.55 trillion (revised) at the end of the fourth quarter of 2018, according to statistics released by the Bureau of Economic Analysis (BEA).

International Trade in Goods and Services

Trade Balance:

- May 2019: -$55.5 billion
- April 2019: -$51.2 billion

The U.S. monthly international trade deficit increased in May 2019 according to the U.S. Bureau of Economic Analysis and the U.S. Census Bureau. The deficit increased from $51.2 billion in April (revised) to $55.5 billion in May, as imports increased more than exports. The previously published April deficit was $50.8 billion. The goods deficit increased $4.4 billion in May to $76.1 billion. The services surplus increased $0.1 billion in May to $20.6 billion.

New Foreign Direct Investment in the United States

Annual Data: Expenditures by foreign direct investors to acquire, establish, or expand U.S. businesses totaled $296.4 billion (preliminary) in 2018. Expenditures were up 8.7 percent from $272.8 billion (revised) in 2017 but were below the annual average of $338.1 billion for 2014–2017.

As in previous years, acquisitions of existing businesses accounted for a large majority of total expenditures.

In 2018, expenditures for acquisitions were $287.3 billion, expenditures to establish new U.S. businesses were $5.3 billion, and expenditures to expand existing foreign-owned businesses were $3.8 billion. Planned total expenditures, which include both first-year and planned future expenditures, were $318.1 billion.

Market Feasibility

California Economy

California has an unemployment rate of 8.2%. The US average is 6.3% (Jan 2021).

California has seen the job market increase by 1.3% over the last year. Future job growth over the next ten years is predicted to be 34.0%, which is higher than the US average of 33.5%.

Tax Rates for California

– The Sales Tax Rate for California is 8.5%. The US average is 7.3%.

- The Income Tax Rate for California is 9.3%. The US average is 4.6%.

- Tax Rates can have a big impact when Comparing Cost of Living.

Income and Salaries for California

- The average income of a California resident is $29,906 a year. The US average is $28,555 a year.

San Bernardino County Economy

San Bernardino County has an unemployment rate of 7.8%. The US average is 6.3% (Jan 2021).

San Bernardino County has seen the job market increase by 2.3% over the last year. Future job growth over the next ten years is predicted to be 38.7%, which is higher than the US average of 33.5%.

Tax Rates for San Bernardino County

- The Sales Tax Rate for San Bernardino County is 7.8%. The US average is 7.3%.

- The Income Tax Rate for San Bernardino County is 9.3%. The US average is 4.6%.

- Tax Rates can have a big impact when Comparing Cost of Living.

Income and Salaries for San Bernardino County

- The average income of a San Bernardino County resident is $21,384 a year. The US average is $28,555 a year.

Ontario Economy

Ontario has an unemployment rate of 6.9%. The US average is 6.3% (Jan 2021).

Ontario has seen the job market increase by -2.3% over the last year. Future job growth over the next ten years is predicted to be 40.6%, which is higher than the US average of 33.5%.

Tax Rates for Ontario

- The Sales Tax Rate for Ontario is 7.8%. The US average is 7.3%.

- The Income Tax Rate for Ontario is 9.3%. The US average is 4.6%.

- Tax Rates can have a big impact when Comparing Cost of Living.

Income and Salaries for Ontario

- The average income of a Ontario resident is $17,137 a year. The US average is $28,555 a year.

Source: *Best Places to Live | Compare Cost of Living, Crime, Cities, Schools and More. Sperling's BestPlaces*, https://www.bestplaces.net/.

Market Feasibility

Economy At Glance California	Mar 2021	Apr 2021	May 2021	June 2021	July 2021	Aug 2021
Labor Force Data						
Civilian Labor Force(1)	18920.6	18895.2	18863.2	18877.2	18927.5	(p)18,982.8
Employment(1)	17341.3	17378.5	17417.3	17437.6	17493.6	(p)17,551.1
Unemployment(1)	1579.3	1516.7	1445.9	1439.6	1433.8	(p)1,431.6
Unemployment Rate(2)	8.3	8	7.7	7.6	7.6	(p)7.5
Nonfarm Wage and Salary Employment						
Total Nonfarm(3)	16146.4	16248.4	16343.1	16414.6	16527.8	(p)16,632.1
12-month % change	-7.7	8.7	8	5.1	5.5	(p)5.5
Mining and Logging(3)	19.2	19	18.7	18.6	18.8	(p)18.9
12-month % change	-13.9	-6.9	-1.6	0	0.5	(p)-0.5
Construction(3)	886.3	884.1	879.8	877.1	877.8	(p)878.4
12-month % change	-0.8	19.7	6.3	3.2	4.7	(p)4.3
Manufacturing(3)	1250.7	1253.7	1256.6	1258.3	1255.7	(p)1,258.6
12-month % change	-5.4	3.9	2.4	0.8	1.2	(p)1.1
Trade, Transportation, and Utilities(3)	2982.5	2982.6	2987.7	2988.4	2991.3	(p)2,990.5
12-month % change	-2.3	13.4	12.2	5.9	5.3	(p)3.8
Information(3)	529.2	527.3	538.6	539.6	545	(p)547.2
12-month % change	-8.9	3.4	6.1	7.6	7.7	(p)7.7
Financial Activities(3)	809.5	810.7	811.8	808.8	806.6	(p)809.8
12-month % change	-4.3	1.3	1.2	0.8	0.5	(p)0.7
Professional & Business Services(3)	2643.9	2662.4	2669.7	2672.2	2680.6	(p)2,694.6
12-month % change	-3.3	7.6	6.5	5.9	6.1	(p)6.2
Education & Health Services(3)	2747.5	2762.5	2772.9	2782.1	2793.3	(p)2,787.0
12-month % change	-3.8	7.2	5.9	3.6	3.4	(p)2.6
Leisure & Hospitality(3)	1418	1478.4	1531.1	1574.6	1627.4	(p)1,660.5
12-month % change	-28.6	37.8	36.7	20.2	24.8	(p)27.7
Other Services(3)	458.7	466.6	471	482	491.9	(p)500.3
12-month % change	-20.8	18	14.7	10.1	10.3	(p)17.4
Government(3)	2400.9	2401.1	2405.2	2412.9	2439.4	(p)2,486.3
12-month % change	-8.1	-4.7	-1.1	0	0	(p)0.3

Footnotes

(1) Number of persons, in thousands, seasonally adjusted.

(2) In percent, seasonally adjusted.

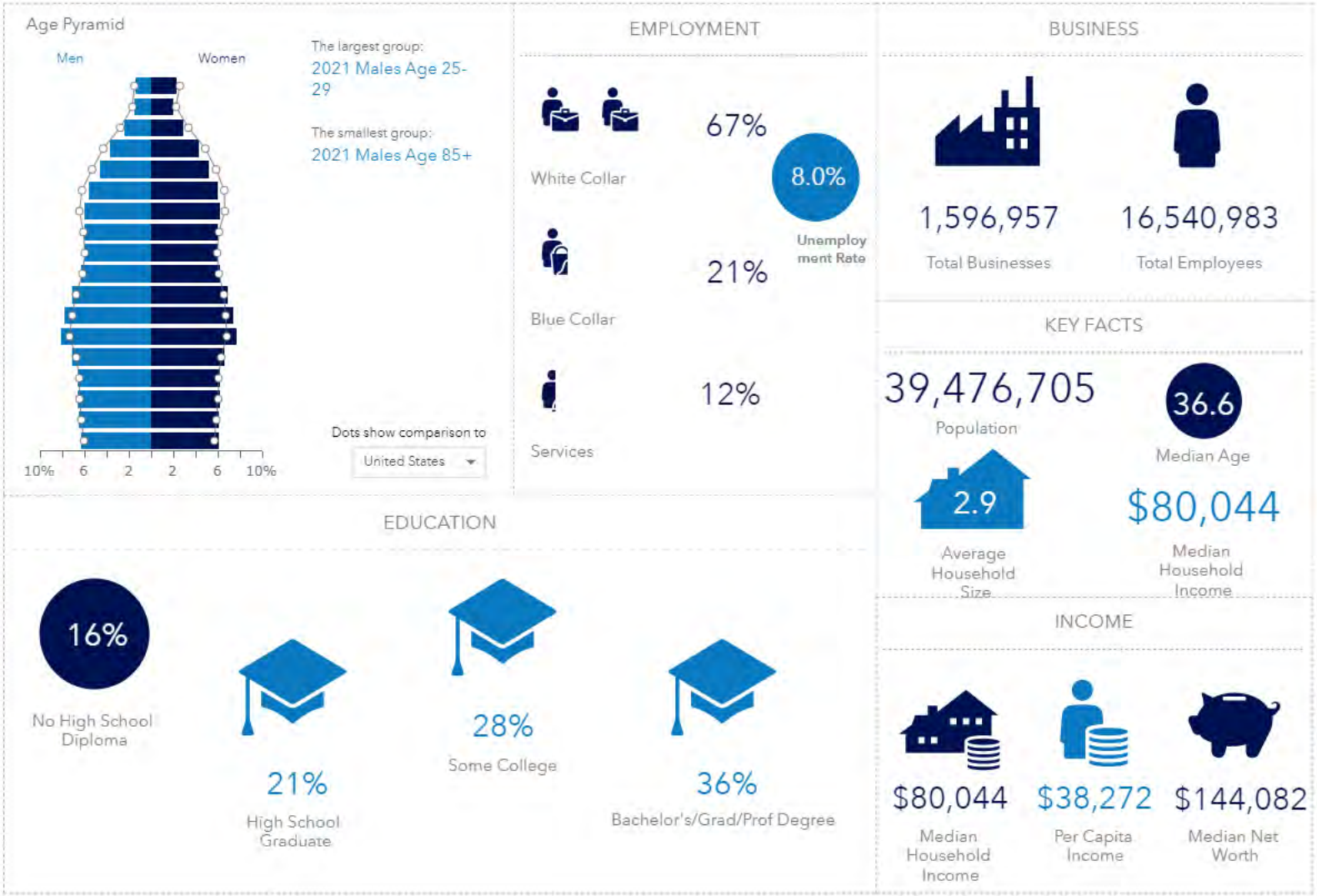
(3) Number of jobs, in thousands, seasonally adjusted.

(P) Preliminary

(r) Revised

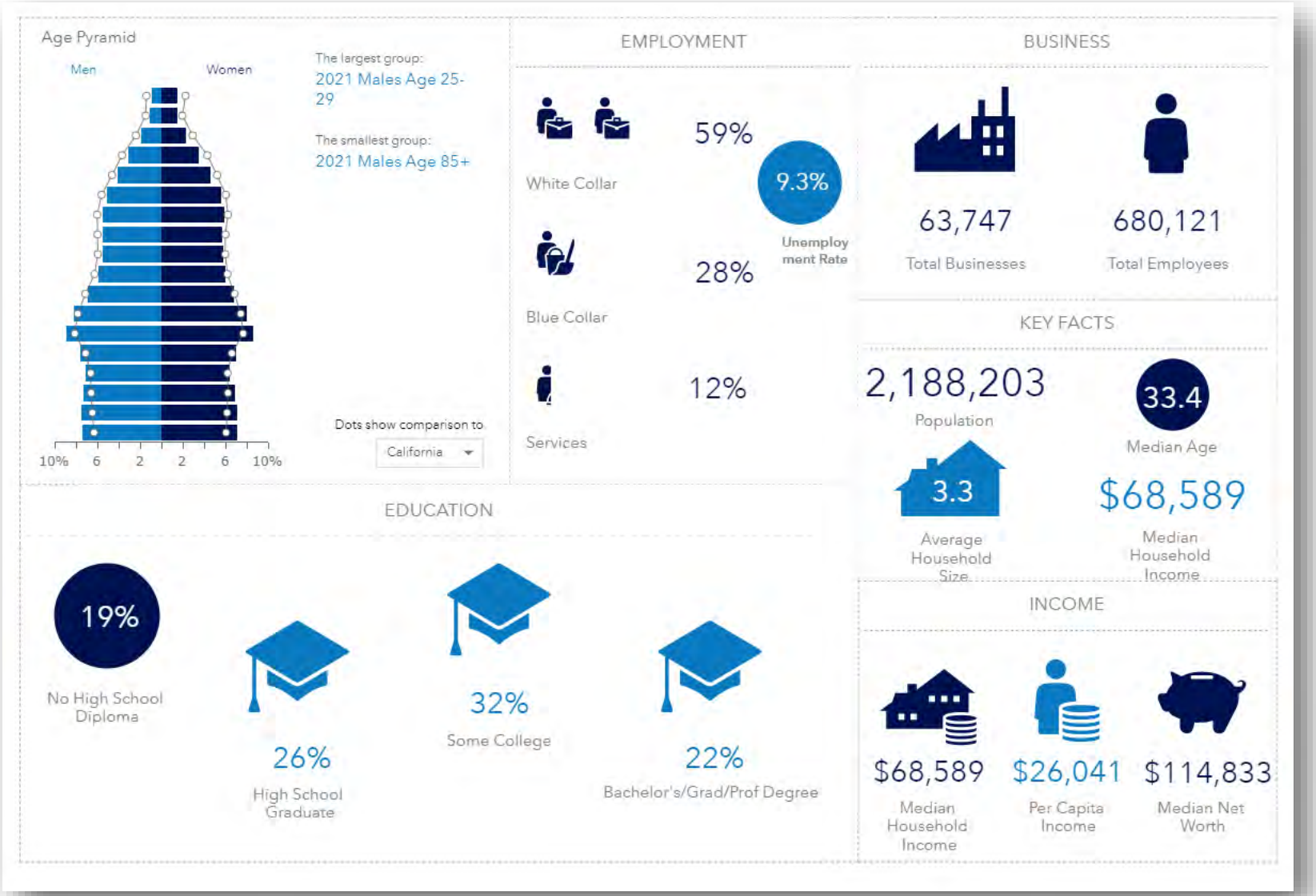
Market Feasibility

California Demographics Summary



Market Feasibility

San Bernardino County Demographics Summary



Market Feasibility

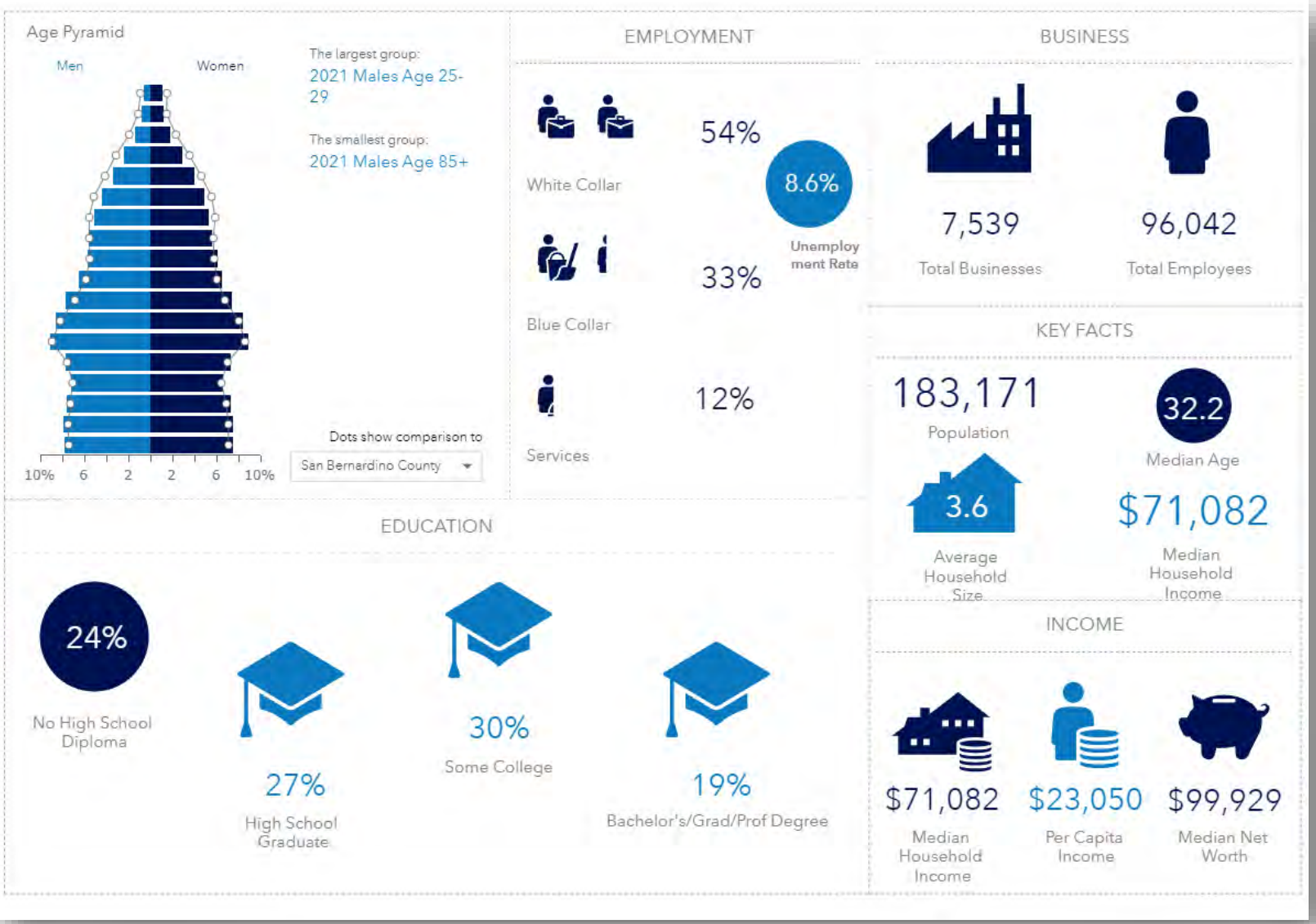
San Bernardino County | Demographic Tables

San Bernardino County, California	Estimate	Margin of Error	Percent	Percent Margin of Error
SEX AND AGE				
Total population	2,180,085	*****	2,180,085	(X)
Male	1,086,226	±637	49.8%	±0.1
Female	1,093,859	±637	50.2%	±0.1
Sex ratio (males per 100 females)	99.3	±0.1	(X)	(X)
Under 5 years	151,731	±767	7.0%	±0.1
5 to 9 years	155,183	±5,575	7.1%	±0.3
10 to 14 years	167,305	±5,539	7.7%	±0.3
15 to 19 years	155,930	±671	7.2%	±0.1
20 to 24 years	159,148	±594	7.3%	±0.1
25 to 34 years	336,303	±942	15.4%	±0.1
35 to 44 years	283,746	±873	13.0%	±0.1
45 to 54 years	262,434	±1,127	12.0%	±0.1
55 to 59 years	131,001	±4,218	6.0%	±0.2
60 to 64 years	116,492	±4,317	5.3%	±0.2
65 to 74 years	160,976	±331	7.4%	±0.1
75 to 84 years	72,827	±2,680	3.3%	±0.1
85 years and over	27,009	±2,622	1.2%	±0.1
Median age (years)	33.8	±0.1	(X)	(X)
Under 18 years	569,638	*****	26.1%	*****
16 years and over	1,675,554	±2,740	76.9%	±0.1
18 years and over	1,610,447	*****	73.9%	*****
21 years and over	1,516,148	±3,660	69.5%	±0.2
62 years and over	325,655	±3,200	14.9%	±0.1
65 years and over	260,812	±181	12.0%	±0.1
18 years and over	1,610,447	*****	1,610,447	(X)
Male	794,408	±248	49.3%	±0.1
Female	816,039	±247	50.7%	±0.1
Sex ratio (males per 100 females)	97.3	±0.1	(X)	(X)
65 years and over	260,812	±181	260,812	(X)
Male	117,464	±303	45.0%	±0.1
Female	143,348	±247	55.0%	±0.1
Sex ratio (males per 100 females)	81.9	±0.3	(X)	(X)
RACE				
Total population	2,180,085	*****	2,180,085	(X)
One race	2,065,464	±10,275	94.7%	±0.5
Two or more races	114,621	±10,275	5.3%	±0.5
One race	2,065,464	±10,275	94.7%	±0.5
White	1,351,926	±19,123	62.0%	±0.9
Black or African American	181,122	±6,792	8.3%	±0.3
American Indian and Alaska Native	17,061	±2,855	0.8%	±0.1

San Bernardino County, California	Estimate	Margin of Error	Percent	Percent Margin of Error
Asian	160,336	±3,361	7.4%	±0.2
Asian Indian	12,729	±3,707	0.6%	±0.2
Chinese	46,366	±6,124	2.1%	±0.3
Filipino	45,503	±6,076	2.1%	±0.3
Korean	16,352	±3,171	0.8%	±0.1
Vietnamese	13,759	±3,622	0.6%	±0.2
Other Asian	21,927	±3,830	1.0%	±0.2
Native Hawaiian and Other Pacific Islander	8,247	±1,747	0.4%	±0.1
Some other race	346,772	±19,715	15.9%	±0.9
Two or more races	114,621	±10,275	5.3%	±0.5
White and Black or African American	23,047	±5,659	1.1%	±0.3
White and American Indian and Alaska Native	15,701	±4,414	0.7%	±0.2
White and Asian	18,340	±3,382	0.8%	±0.2
Race alone or in combination with one or more other races				
Total population	2,180,085	*****	2,180,085	(X)
White	1,443,800	±21,302	66.2%	±1.0
Black or African American	218,705	±4,427	10.0%	±0.2
American Indian and Alaska Native	42,582	±5,350	2.0%	±0.2
Asian	193,095	±3,808	8.9%	±0.2
Native Hawaiian and Other Pacific Islander	18,578	±3,520	0.9%	±0.2
Some other race	386,752	±19,791	17.7%	±0.9
HISPANIC OR LATINO AND RACE				
Total population	2,180,085	*****	2,180,085	(X)
Hispanic or Latino (of any race)	1,186,808	*****	54.4%	*****
Mexican	1,019,547	±12,689	46.8%	±0.6
Puerto Rican	18,118	±5,000	0.8%	±0.2
Cuban	5,076	±1,669	0.2%	±0.1
Other Hispanic or Latino	144,067	±12,471	6.6%	±0.6
Not Hispanic or Latino	993,277	*****	45.6%	*****
White alone	591,879	±1,432	27.1%	±0.1
Black or African American alone	168,946	±5,476	7.7%	±0.3
Asian alone	157,172	±3,372	7.2%	±0.2
Two or more races	56,208	±6,563	2.6%	±0.3
Two races excluding Some other race, and Three or more races	53,338	±6,419	2.4%	±0.3
Total housing units	731,393	±941	(X)	(X)
CITIZEN, VOTING AGE POPULATION				
Citizen, 18 and over population	1,399,650	±11,326	1,399,650	(X)
Male	690,022	±7,363	49.3%	±0.3
Female	709,628	±5,924	50.7%	±0.3

Market Feasibility

Ontario Demographics Summary



Market Feasibility

Ontario | **Demographic Tables**

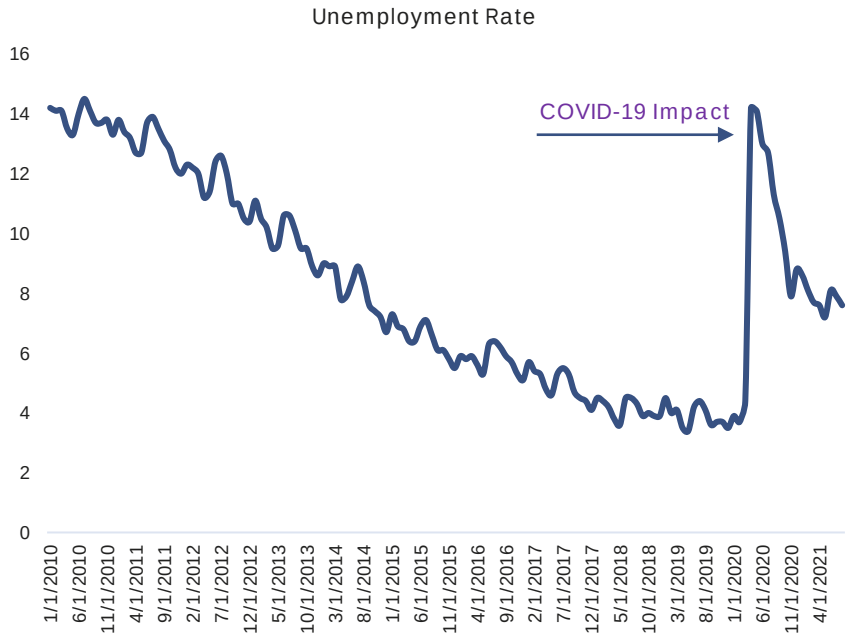
Ontario, California	Estimate	Margin of Error	Percent	Percent Margin of Error
SEX AND AGE				
Total population	184,999	±52	184,999	(X)
Male	90,016	±2,978	48.7%	±1.6
Female	94,983	±2,979	51.3%	±1.6
Sex ratio (males per 100 females)	94.8	±6.2	(X)	(X)
Under 5 years	13,807	±2,207	7.5%	±1.2
5 to 9 years	13,395	±2,197	7.2%	±1.2
10 to 14 years	14,699	±2,234	7.9%	±1.2
15 to 19 years	11,933	±1,926	6.5%	±1.0
20 to 24 years	12,797	±2,017	6.9%	±1.1
25 to 34 years	36,105	±2,930	19.5%	±1.6
35 to 44 years	23,624	±2,617	12.8%	±1.4
45 to 54 years	21,931	±2,607	11.9%	±1.4
55 to 59 years	10,116	±1,566	5.5%	±0.8
60 to 64 years	10,241	±1,799	5.5%	±1.0
65 to 74 years	9,450	±1,706	5.1%	±0.9
75 to 84 years	5,685	±1,147	3.1%	±0.6
85 years and over	1,216	±612	0.7%	±0.3
Median age (years)	32.1	±1.0	(X)	(X)
Under 18 years	49,419	±3,954	26.7%	±2.1
16 years and over	140,404	±3,957	75.9%	±2.1
18 years and over	135,580	±3,957	73.3%	±2.1
21 years and over	128,868	±3,898	69.7%	±2.1
62 years and over	21,918	±2,316	11.8%	±1.3
65 years and over	16,351	±2,133	8.8%	±1.2
18 years and over	135,580	±3,957	135,580	(X)
Male	67,143	±3,245	49.5%	±1.8
Female	68,437	±2,965	50.5%	±1.8
Sex ratio (males per 100 females)	98.1	±7.0	(X)	(X)
65 years and over	16,351	±2,133	16,351	(X)
Male	7,032	±1,287	43.0%	±4.8
Female	9,319	±1,357	57.0%	±4.8
Sex ratio (males per 100 females)	75.5	±14.7	(X)	(X)
RACE				
Total population	184,999	±52	184,999	(X)
One race	174,511	±2,287	94.3%	±1.2
Two or more races	10,488	±2,290	5.7%	±1.2
One race	174,511	±2,287	94.3%	±1.2
White	114,932	±6,968	62.1%	±3.8
Black or African American	8,225	±3,180	4.4%	±1.7
American Indian and Alaska Native	1,010	±716	0.5%	±0.4

Ontario, California	Estimate	Margin of Error	Percent	Percent Margin of Error
Asian	12,600	±3,018	6.8%	±1.6
Asian Indian	599	±952	0.3%	±0.5
Native Hawaiian and Other Pacific Islander	1,278	±1,300	0.7%	±0.7
Some other race	36,466	±5,923	19.7%	±3.2
Two or more races	10,488	±2,290	5.7%	±1.2
White and Black or African American	2,137	±1,513	1.2%	±0.8
White and American Indian and Alaska Native	1,026	±699	0.6%	±0.4
White and Asian	949	±607	0.5%	±0.3
Black or African American and American Indian and Alaska Native	172	±282	0.1%	±0.2
Race alone or in combination with one or more other races				
Total population	184,999	±52	184,999	(X)
White	123,478	±6,651	66.7%	±3.6
Black or African American	11,048	±3,643	6.0%	±2.0
American Indian and Alaska Native	3,080	±1,145	1.7%	±0.6
Asian	14,468	±3,225	7.8%	±1.7
Native Hawaiian and Other Pacific Islander	2,206	±1,656	1.2%	±0.9
Some other race	42,377	±5,894	22.9%	±3.2
HISPANIC OR LATINO AND RACE				
Total population	184,999	±52	184,999	(X)
Hispanic or Latino (of any race)	132,110	±6,159	71.4%	±3.3
Mexican	114,053	±6,540	61.7%	±3.5
Puerto Rican	1,793	±1,419	1.0%	±0.8
Cuban	813	±716	0.4%	±0.4
Other Hispanic or Latino	15,451	±4,228	8.4%	±2.3
Not Hispanic or Latino	52,889	±6,164	28.6%	±3.3
White alone	27,667	±4,260	15.0%	±2.3
Black or African American alone	7,443	±3,037	4.0%	±1.6
American Indian and Alaska Native alone	363	±373	0.2%	±0.2
Asian alone	12,472	±3,039	6.7%	±1.6
Native Hawaiian and Other Pacific Islander alone	1,049	±1,246	0.6%	±0.7
Some other race alone	123	±199	0.1%	±0.1
Two or more races	3,772	±1,632	2.0%	±0.9
Two races including Some other race	350	±401	0.2%	±0.2
Two races excluding Some other race, and Three or more races	3,422	±1,541	1.8%	±0.8
Total housing units	52,886	±2,128	(X)	(X)
CITIZEN, VOTING AGE POPULATION				
Citizen, 18 and over population	108,478	±5,132	108,478	(X)
Male	53,030	±3,426	48.9%	±2.1
Female	55,448	±3,429	51.1%	±2.1

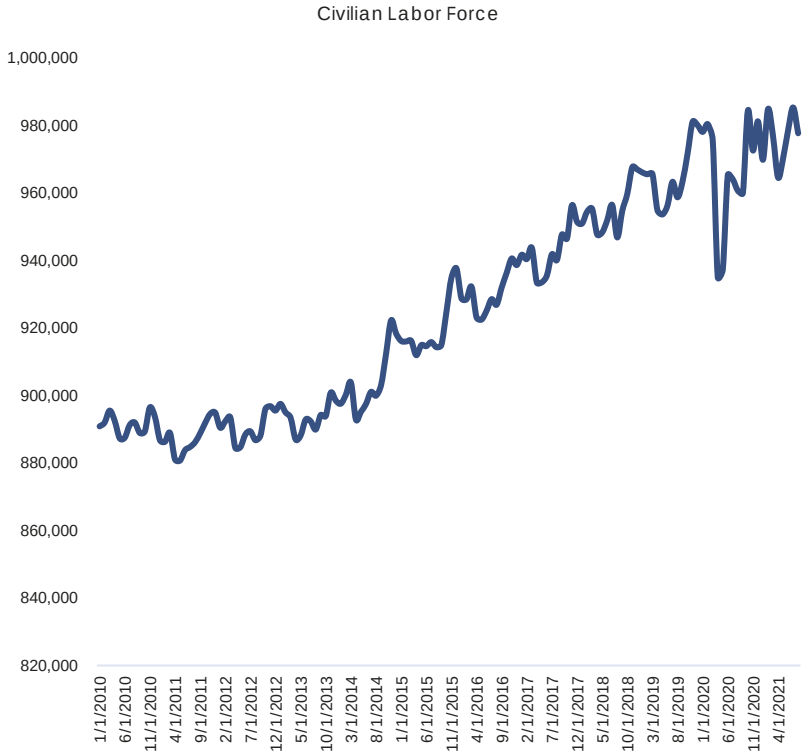
Market Feasibility

Availability of Trained or Trainable Labor

According to the Federal Reserve Bank of St. Louis Economic Data, the unemployment rate for San Bernardino County (latest data) was recorded at about 7.6 percent.



The civilian Labor Force in the subject County according to the Federal Reserve Bank of St. Louis Economic Data and US Bureau of Labor and Statistics was about 977,677. The unemployment rate reached its highest rate of about 14.5 percent in July 2010. Based on the current unemployment rate, the County retains about 74,303 job seekers.

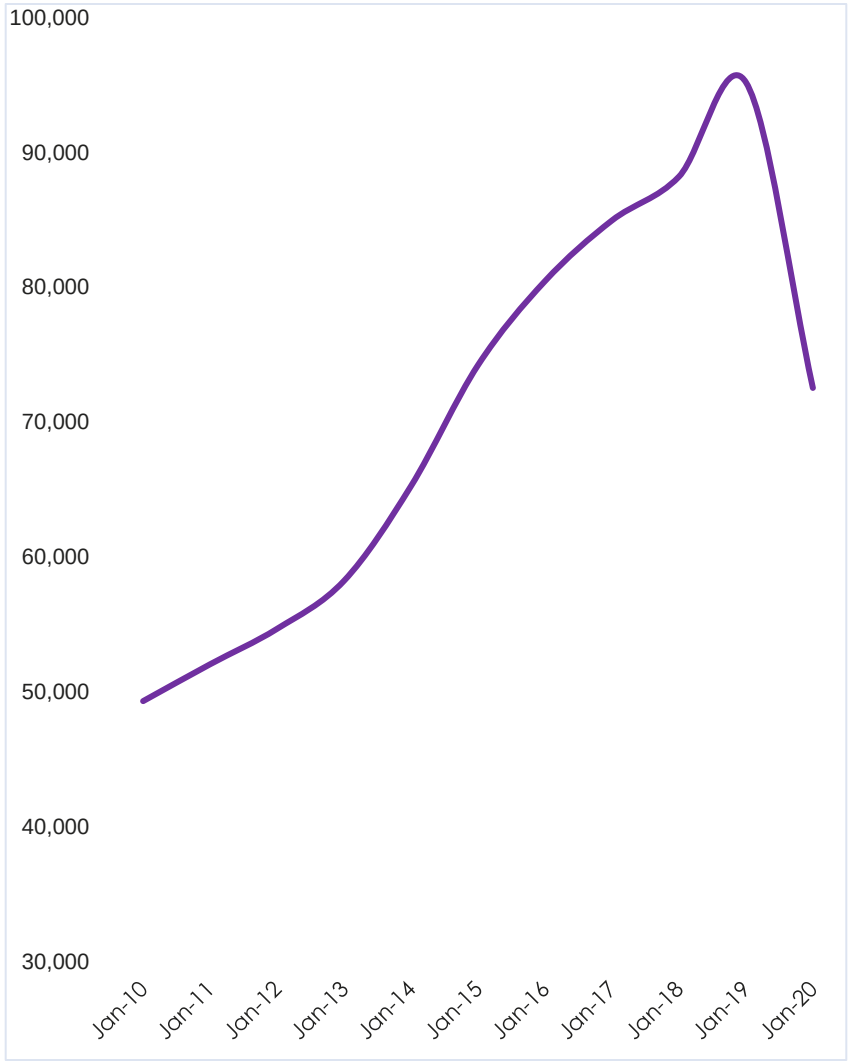


The Company intends to manage the Subject Project with the years of operations and management experience that principals of the Company has. This item does not appear to be a risk for the Subject Project.

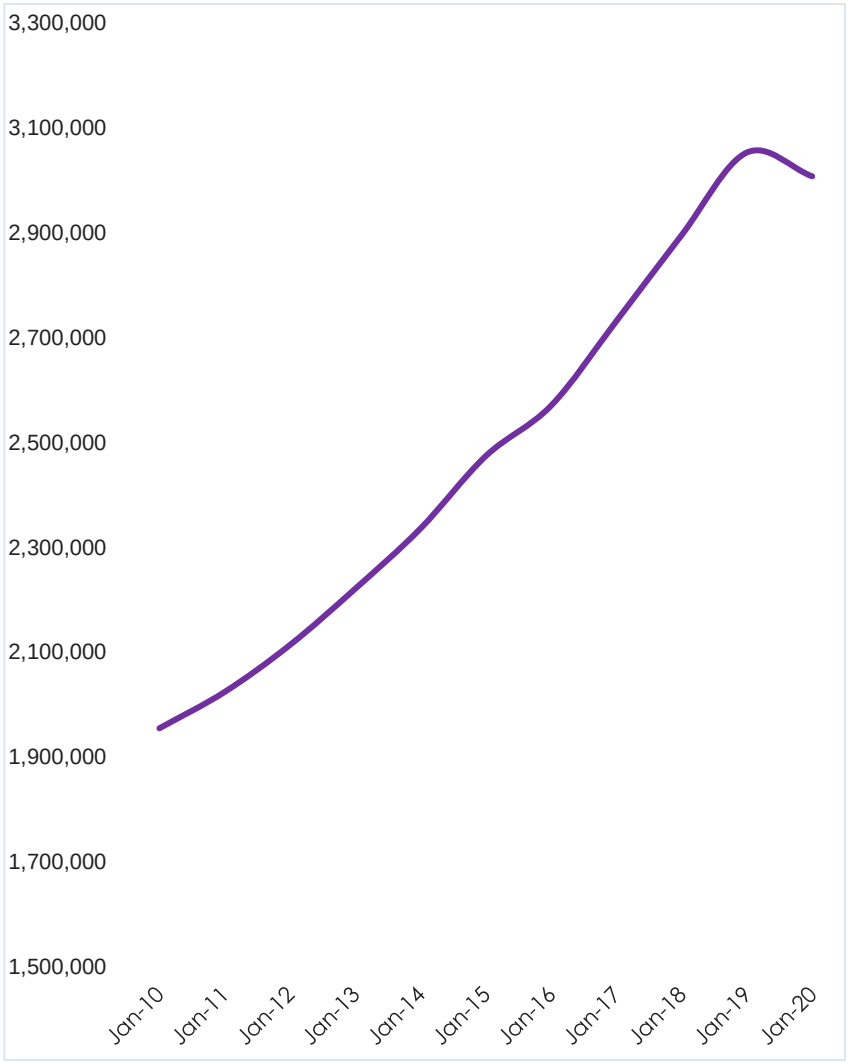
Market Feasibility

The industry and its relevant leveraged structure indicates that the **Company's** revenue should follow trends in the overall economy, including disposable income of end-users/consumers. Based on the analysis, the market area economy appears to be growing which indicates reasonable potential for the Subject Project.

Gross Domestic Product: Accommodation and Food Services in California



Gross Domestic Product: All Industry Total in California



Source: Veritas Development Advisors Secondary Research Analysis

Hotel Market Overview

Hotels & Motels in the US

- IBISWorld's analysts constantly monitor the industry impacts of current events in real-time – here is an update of how this industry is likely to be impacted as a result of the global COVID-19 pandemic:
- Recovery for the Hotels and Motels industry is anticipated to be skewed toward domestic, leisure markets where COVID-19 (coronavirus) restrictions have been lifted.
- Operators that cater to business customers such as, truckers, contractors, construction workers, healthcare workers and others that must travel for work and do not have the ability to conduct their work remotely are anticipated to experience an increase in demand.
- International travel to the United States has remained subdued, as restrictions remain in place on travelers from key markets such as, Canada and the European Union. This is anticipated to decelerate revenue growth for the industry in 2021.

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Market Feasibility

Hotels & Motels in the US

Checking in: Industry players will likely continue expanding abroad into emerging economies. The Hotels and Motels industry is highly susceptible to changes in the domestic and global economic environments, which has caused the industry to experience substantial volatility due to the onset of the COVID-19 (coronavirus) pandemic in 2020. Over most of the five years to 2021, the industry has benefited from increases in travel spending, corporate profit and general consumer spending. These factors were all affected substantially by the coronavirus pandemic. IBISWorld expects industry revenue to fall at an annualized rate of 7.6% to $133.0 billion over the five years to 2021, despite an anticipated increase of 42.9% in 2021 amid a strong recovery in domestic leisure travel.

Revenue $133.0 bn	Growth,21-26 10.8% (Annual)
Profit Margin 3.1%	Growth,14-19 --15.3% (Annual)
Wages Share $43.0 bn	Growth,21-26 7.8%

Key Points

- Over the past five years, rising external competition has increased pressure on many hotel and motel operators, leading to competitive room rates. While some operators have shifted to offer premium services and accommodations to increase their rates or diversify revenue streams, not all operators have been able to make this shift. This has led to declines in industry profit.
- Additionally, the industry has been substantially affected by the onset and spread of coronavirus.
- Although domestic leisure travel has rebounded strongly in 2021, both international and business travel remain significantly below prepandemic levels amid the emergence of the Delta variant.
- Over the five years to 2026, IBISWorld projects that the industry will rebound and expand, with particularly strong growth in extended-stay hotels, boutique hotels, spa and health retreats and resorts segments.
- As demand for these auxiliary services picks up, industry employment is anticipated to recover and rise over the next five years. Industry players are also expected to continue expanding abroad into emerging economies, such as Asia, Eastern Europe and South America.
- These foreign markets are expected to somewhat detract from domestic investment, as they offer higher growth prospects for industry operators.
- Nonetheless, industry revenue is estimated to increase at an annualized rate of 10.8% to $222.0 billion over the five years to 2026.

Source: IBISWorld, US Industry (NAICS) Report 72111, September 2021

Market Feasibility

Key External Drivers

Domestic trips by US residents

Trends in domestic travel, especially business travel, and total nights spent away from home directly affect demand for accommodation. As the number of trips made by US citizens rises, demand for hotels and models increases, while the inverse is also true. The number of domestic trips by US residents is expected to increase in 2021, representing a potential opportunity for the industry.

Consumer spending

Consumer spending levels have a direct effect on travel demand. When consumers spend more overall, they are more likely to spend on travel and accommodations. Therefore, a rise in consumer spending benefits demand for hotels and motels. Conversely, as consumers reduce spending, they decrease excess spending on travel, reducing demand for hotels and motels. Consumer spending is expected to increase in 2021.

Inbound trips by non-US residents

Trends in international visitor arrivals and their lengths of stay influence demand for accommodation. A rise in inbound trips positively affects demand for hotels and motels. The number of inbound trips by non-US residents is expected to increase in 2021.

Consumer confidence index

The Consumer Confidence Index measures consumer sentiment regarding the current economic outlook. Changes in consumer confidence influence decisions that individuals make concerning current and future expenditure on entertainment and travel. When consumers feel optimistic regarding the economic outlook, they are more likely to plan travel arrangements and book nights at hotels or motels. However, as consumers grow increasingly skeptical of the economic outlook, they forego spending on travel and accommodations. The Consumer Confidence Index is expected to increase in 2021.

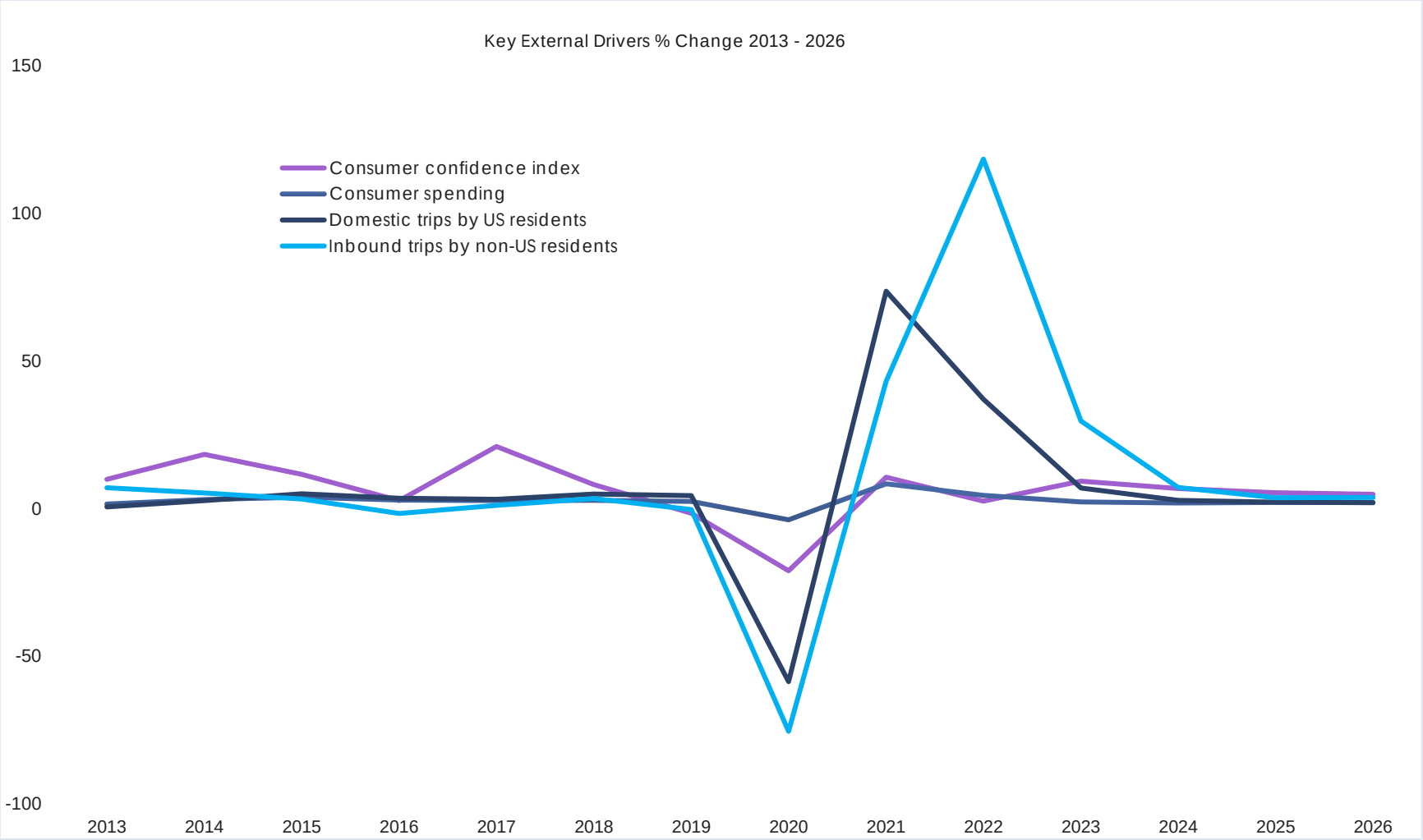
External competition for the Hotels and Motels Industry

The Hotels and Motels industry experiences competition from lodging alternatives, such as RV parks, bed-and-breakfast establishments, room rental services and hostels. Travelers are increasingly comparing prices across these alternatives when booking travel arrangements. External competition for the Hotels and Motels industry is expected to increase in 2021, posing a potential threat to the industry.

Market Feasibility

Key External Drivers

Industry revenue is expected industry revenue to fall at an annualized rate of 7.6% to $133.0 billion over the five years to 2021, despite an anticipated increase of 42.9% in 2021 amid a strong recovery in domestic leisure travel.



Market Feasibility

Current Performance

The Hotels and Motels industry has experienced elevated volatility over the five years to 2021.

Hotels and motels primarily provide short-term lodging to consumers; however, many also offer other services and accommodations as a way to diversify revenue. During most of the period, industry revenue grew at a steady rate, driven by positive economic factors that were favorably affecting the domestic economy as a whole. However, in early 2020, as the COVID-19 (coronavirus) pandemic spread across the globe, this trend sharply reversed, resulting in a sharp decline in industry revenue that year overall.

Economic indicators, such as per capita disposable income and consumer confidence, rose early during the period, only to experience sharp decline later during the period. Thus, all forms of short-term accommodation have experienced a substantial decrease in demand. Consumers that had previously increased spending on travel for both business and leisure purposes have abruptly curbed that, causing industry revenue to decline. Since destination hotels and motels rely heavily on domestic and foreign tourism, any changes in domestic and international travel substantially contribute to the industry's bottom line. Industry revenue is expected to decrease an annualized 7.6% to $133.0 billion over five years to 2021, despite an estimated increase of 42.9% in 2021 alone due to the expulsion pent-up domestic travel demand.

Changing Direction And The Coronavirus

The industry is particularly sensitive to macroeconomic factors, which can negatively affect consumers' tendency to travel.

Unexpected changes in geopolitical order can potentially affect revenue growth should travel restrictions arise or consumer sentiment sour. Although the US economy has improved during most of the period, the United States has been negatively affected by the coronavirus outbreak.

The coronavirus spread rapidly within the United States, forcing many state and local governments, with the aid of the federal government, to take action.

Many state and local governments implemented stay-at-home orders, mandating the closure of nonessential businesses. This caused a shock to the US economy, and many companies were forced to lay off employees and temporarily shut down, while consumer sentiment declined, causing a near halt to domestic travel. The federal government also banned travel from international visitors originating from countries and regions that were drastically affected by the virus.

Consequently, demand for hotels and motels has decreased, eliminating all growth experienced between 2016 and 2019. However, in 2021 domestic travel is estimated to sharply

Market Feasibility

rise, in line with the cessation of government restrictions on businesses and travel.

Furthermore, the coronavirus vaccination campaign has resulting in a rising percentage of the population successfully vaccinated, which has contributed to a surge in domestic leisure travel during summer 2021, benefiting industry operators. However, restrictions regarding international visitors entering the United States remain in place for several key markets such as the European Union and Canada.

Consequently, demand from international travelers is anticipated to rise at a much slower rate than demand from domestic travelers. Moreover, although business travel has rebounded somewhat from lows endured during the coronavirus pandemic, the spread of the Delta variant has delayed the return to the office for many employees as well as business conferences and trips.

Industry Structure

Over the past five years, the structure of the industry has shifted.Many major operators have altered their business structure, through actions such as forming real estate investment trusts to raise funds.

Additionally, major operators have restructured operations to solely provide specialist services in hotel management through increased franchising opportunities. While revenue from hotel management has declined, such services have provided an opportunity to generate higher profit due to the elimination of many property-related costs. In 2017,

Hilton Worldwide Holdings Inc. separated into three separate entities to capitalize on growth opportunities and increase its competitiveness. The company spun-off its domestically owned and leased properties into a real estate investment trust.

Ultimately, owners are subject to changes in property value cycles and economic conditions, in addition to any imbalances in hotel room demand and supply influences.

Similarly, Wyndham Worldwide Corporation separated into two separate holdings, Wyndham Hotels and Resorts Inc. and Wyndham Destinations. This separation aimed to enable each segment to grow and operate independently. Nevertheless, the industry is still largely property-based, with hotels and motels owning or leasing property specifically for hotel and motel operation.

Declining Profit

Profit has fallen over the past five years, partially because many operators have been unable to increase room rates amid increased competition.

While the rate of construction and development to get new rooms on the market has not kept up with increased demand, operators have experienced substantial external competition from companies such as

Market Feasibility

Airbnb Inc. and VRBO. These services permit consumers to rent rooms, apartments or whole houses online rather than a traditional hotel room. Such services provide a wide range of options to consumers and can play into a variety of different price points.

This has forced many operators to offer competitive pricing to maintain high demand or to provide upscale amenities to compensate for the price difference.

Furthermore, the crippling effect on the industry from the coronavirus pandemic, which caused rapid declines in occupancy rates and revenue per available room, coupled with rising operating costs due to the implementation of pandemic-related sanitation measures, has also contributed to a sharp decline in profit.

Consequently, profit, measured as earnings before interest and taxes, is estimated to account for 3.1% of revenue in 2021, down from 18.4% in 2016.

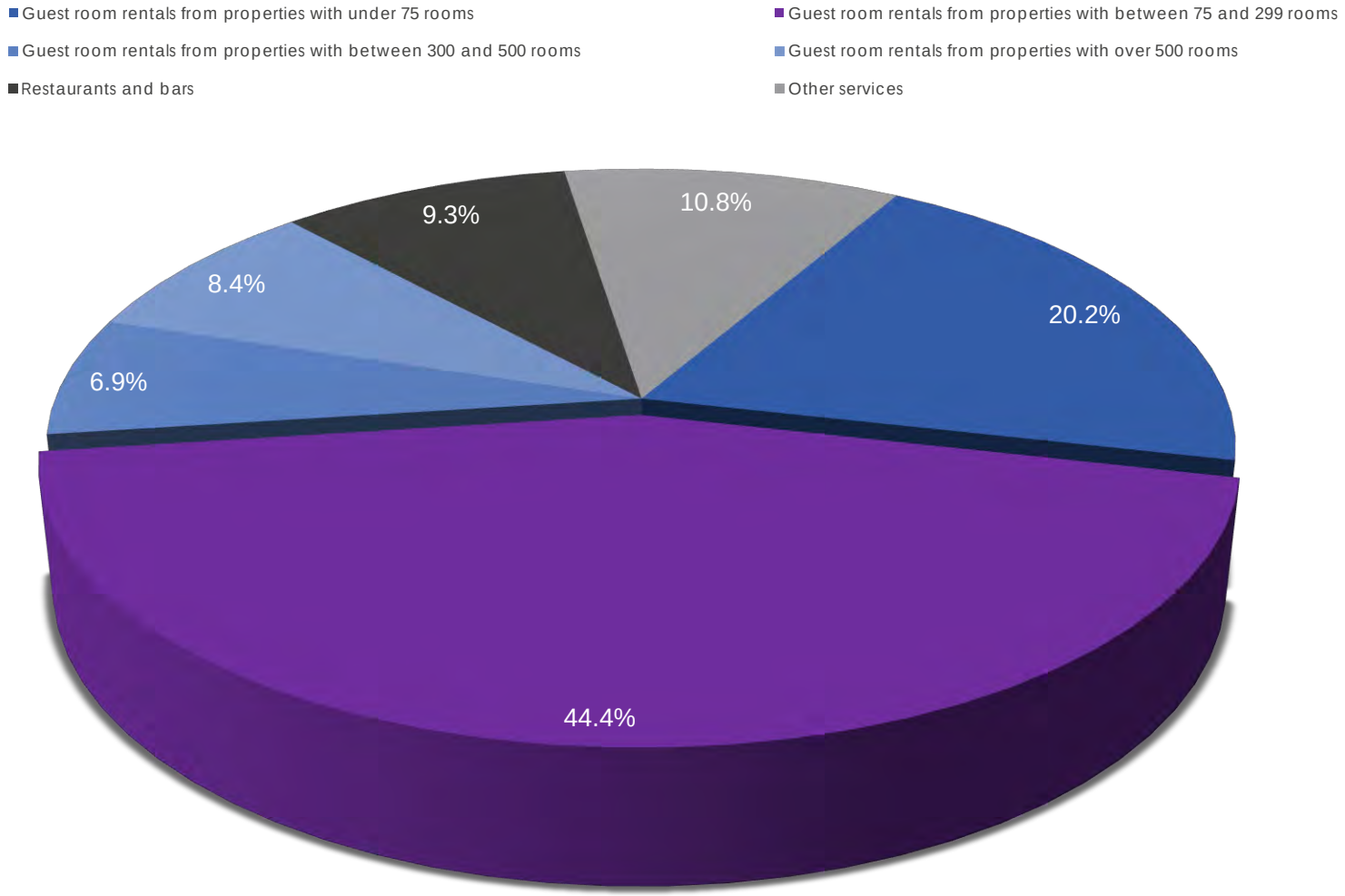
Declining revenue and profit have led many small operators to close locations either temporarily or permanently.

Consequently, the number of industry establishments has decreased an annualized 0.4% to 92,746 locations over the five years to 2021.

The decline in establishments resulting from the pandemic in 2020 is anticipated to outweigh strong establishment growth early during the period. Similarly, industry employment has decreased an annualized 3.3% to 1.4 million workers over the five years to 2021. IBISWorld estimates that industry employment declined 34.5% in 2020 alone.

Market Feasibility

Products & Services (Market Share)



Market Feasibility

Demand Determinants

Domestic travel

Demand for hotel and motel accommodation is dependent on factors that affect travel, such as disposable income, which is influenced by changes in general employment growth and movements in interest and tax rates.

Changes in disposable income affect the number of trips a household takes and its expenditures while traveling, which, in turn, affects the growth and economic effect of the hospitality tourism industry.

The COVID-19 (coronavirus) pandemic in 2020 resulted in a surge in the unemployment rate, widespread economic uncertainty and restrictions on domestic travel. These factors resulted in a decline in domestic travel in 2020.

Nonetheless, in 2021, demand from domestic travel is anticipated to rise from 2020 lows, as individuals seek to travel after a year where Consequently, demand for these products has increased among both nontraditional and travel was largely restricted.

The price of fuel is also important, which affects disposable income and general travel demand. When fuel prices increase, it reduces disposable income and consumers' willingness to spend on long car trips.

Changes in the availability of leisure time also affects the industry. As the unemployment rate falls, time available for leisure activities, such as travel also declines, despite the increased disposable income. It also adds more tradeoffs to consumers who have to use limited paid vacation days to travel. Holiday expenditure also competes with other leisure and recreational industries and competes for a share of household disposable income.

A longer-term influence on travel patterns is the cost of taking a domestic trip compared with an international one. The difference between the two is influenced by exchange rate movements, the availability of inexpensive airfares and holiday packages and the supply of airline seats. If traveling domestically becomes more expensive relative to international trips, individuals may choose to travel internationally, affecting the growth of domestic industry operators.

Finally, tourism promotions by private operators and federal and state governments, including through TV programs and special sporting events, also stimulates travel. However, individual state government promotions typically influence domestic travel patterns to favor only their state, rather than the entire industry.

Business travel

Business travel is greatly influenced by changes in economic growth, business confidence and corporate profit. Economic conditions directly affect the number of business trips taken, the length of stay and budgeted travel spending.

Market Feasibility

Business travel has experienced growth throughout most of the five years to 2021 as many corporations have benefited from the growth in the domestic economy.

However, the spread of the coronavirus throughout the United States in 2020 has resulted in a sharp contraction in business travel, as employees increasingly work from home and avoid nonessential travel.

Additionally, technology such as teleconferencing and conference calling has replaced business travel during the pandemic, as it is cost-effective and safer. In 2021 business travel levels have remained subdued due to the spread of the delta variant of the coronavirus and a continuation of many employees working from home.

This trend of companies restricting travel spending and conference attendance to focus more technology-based alternatives in an effort to preserve capital is likely to be continued during the outlook period, however at a decreasing rate.

International tourism

International tourism is one of the most competitive industries. International tourism is affected by factors similar to domestic travel and global economic conditions, especially changes in economic growth.

Furthermore, international tourism is affected by changes in the US dollar against other major currencies, which has an effect on the cost of travel and the relative attractiveness of traveling to competing destinations. The coronavirus pandemic has resulted in a sharp decline in international tourism. There are still restrictions placed on individuals attempting to enter the United States who have been in countries experiencing more severe outbreaks of the coronavirus.

Additionally, many states implemented stay-at-home mandates and restrictions on businesses, further reducing the allure of traveling to the United States in 2020. Widespread global economic uncertainty has also limited international tourism.

Although restrictions have been somewhat eased in 2021, international travel demand is anticipated to return at a slower rate compared with domestic travel.

Other factors, such as heightened geopolitical tensions including wars and terrorism, whether feared or actual, affect international travel plans. Many of the top tourist locations have struggled to regain traction for industry operators following terrorism or other negative events or geopolitical issues.

Promotional expenditures and activities, such as major or special events, on the part of governments and other organizations, can raise awareness and interest in travel. Finally, supply factors are also of critical importance, including the availability of airline flights and seats at the times people want to travel, and accommodations to and at their selected destination.

Market Feasibility

External factors

Several external factors can severely affect the industry either directly or indirectly. Such factors include public health crises, government regulation, geopolitical tensions and other macroeconomic factors.

Global or national pandemics can cause increased concern among US and international travelers.

Traveling amid public health crises may place consumers at further risk of catching the ailment, especially when staying at shared locations, such as hotels and motels, or traveling by airplane or train and other shared transportations.

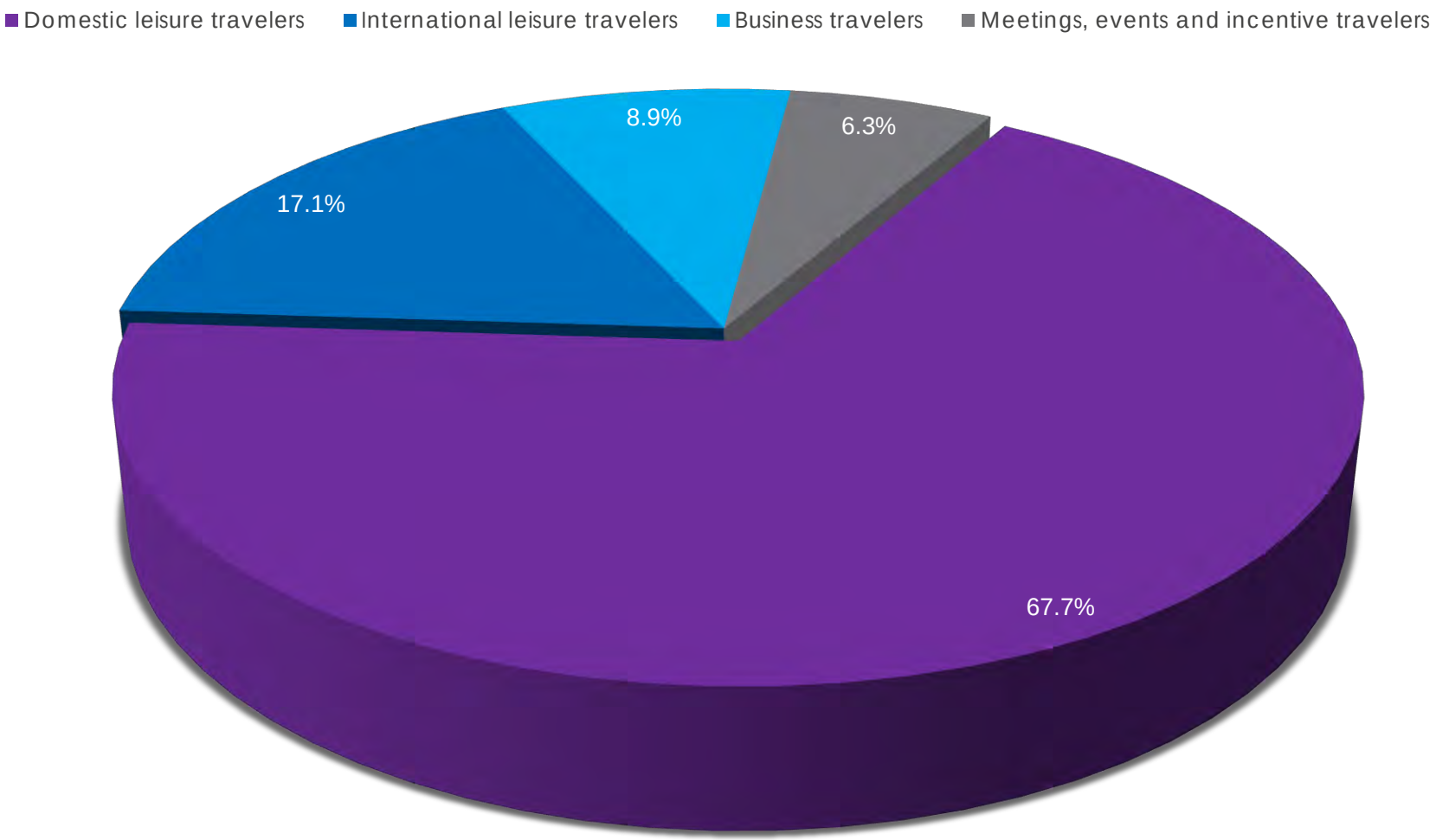
Many hotel and motel guests are traveling far distances, which is the reason they required accommodation services.

As health concerns increase, consumers are more inclined to stay closer to home, limiting demand for travel. Similarly, government regulations that effect travel indirectly influences demand for hotels and motels. When any government restricts travel for individuals to or within the United States, demand will likely be negatively affected, as it reduces the volume of consumers needing industry services.

This has been apparent with the effect of the coronavirus. Hotels and motels experienced a sharp decline in occupancy rates in 2020 as consumers opted to forego travel and stay at home.

Market Feasibility

Major Markets (Market Share)



Market Feasibility

Key Success Factors

Access to multiskilled and flexible workforce:

- Access to multiskilled and well-trained staff is vital to success in the industry.

Being part of a franchising chain:

- There are many benefits to being part of a chain or franchised group, namely brand recognition, national marketing and quality control.

Receiving the benefit of word-of-mouth recommendations:

- Good word-of-mouth recommendations are quite often the most successful promotional tool.

Proximity to key markets:

- The location, facilities and services offered to hotel and motel guests are very important.

Ability to quickly adopt new technology:

- It is essential to be aware of the new technology available in this industry for information, promotions, bookings and general management control systems

Ability to control stock on hand:

- Understanding the various room stock, availability and tariff mechanisms used in this industry is important.

Market Feasibility

Cost Structure Benchmarks

Profit

Profit, measured as earnings before interest and taxes, is expected to account for 3.1% of industry revenue in 2020, driven by the economic damage of the COVID-19 (coronavirus) pandemic.

Purchases

In 2019, wages are expected to account for 21.4% of industry revenue.

Wages

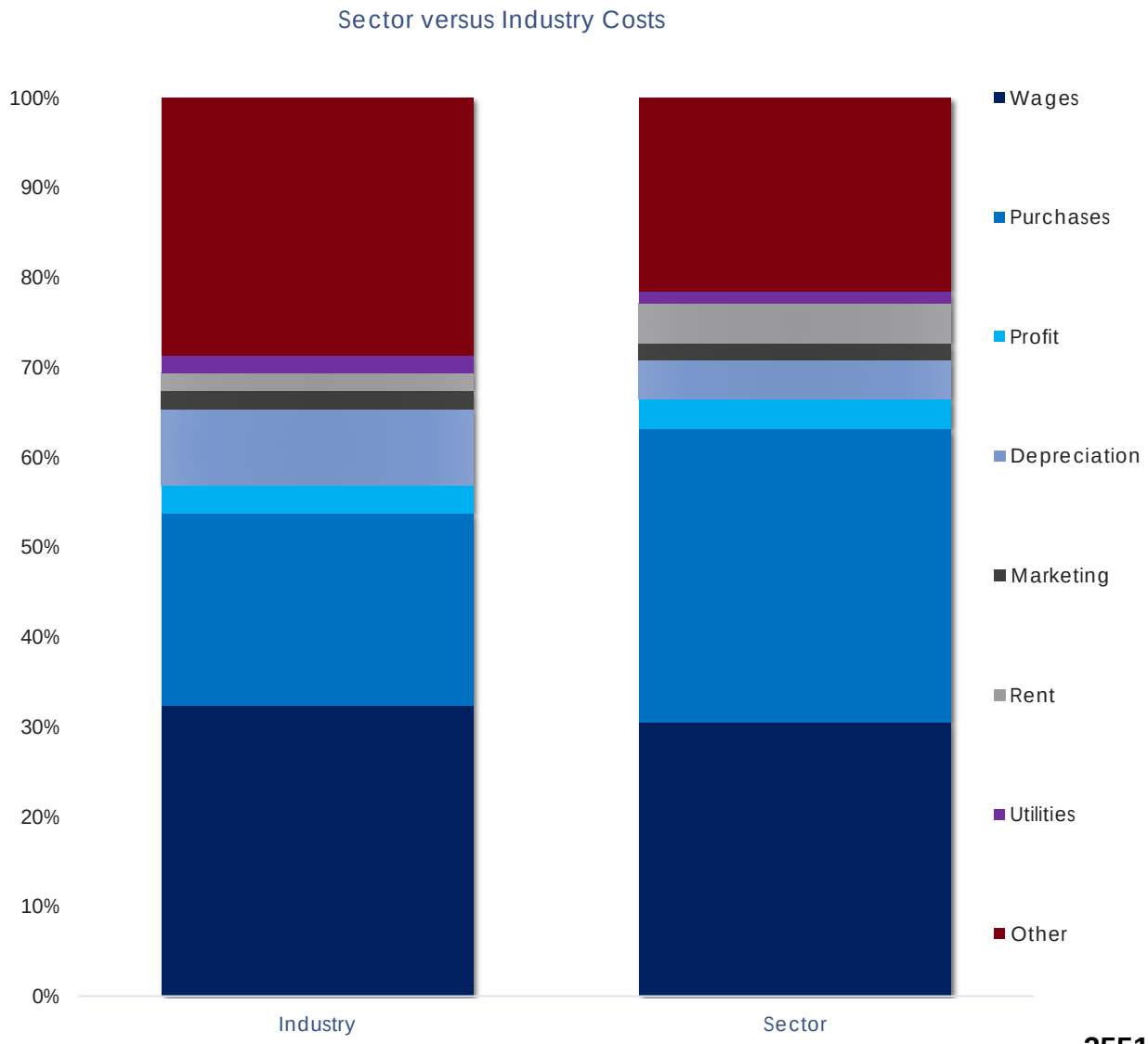
Wages represent 32.3% of industry revenue in 2020.

Marketing

Marketing costs account for 2.1% of industry revenue in 2021.

Depreciation

Depreciation represents an estimated 8.5% of industry revenue in 2020.



Market Feasibility

Major Companies

There are no major players in this industry.

Other Companies

Marriott International Inc.

Market Share: 0.4%

Marriott International Inc. (Marriott) is a lodging company based in Bethesda, MD, with 7,797 global properties in 80 countries and territories. The United States is home to 62.3% of Marriott's rooms.

Marriott operates and franchises its hotels under various brands, including Marriott, the Ritz-Carlton, Renaissance, Courtyard, TownePlace Suites and Bulgari. It also develops and operates vacation ownership resorts under the Marriott Vacation Club, Horizons, the Ritz-Carlton Club and Grand Residences brands, while also running Marriott Executive Apartments. The company employs an estimated 121,000 people worldwide across its various hotels and other locations in 2020 (latest data available).

Marriott's operations extend over most segments of the accommodation market, including luxury, full service and limited service, to suit a variety of travelers and budgets.

While such diversity typically provides some insulation from economic downturns, many of the company's hotels still endure severely cut room rates to remain competitive and maintain positive cash flow during difficult economic periods.

Consequently, Marriott has significantly expanded its US portfolio over the past five years to further inoculate itself from downturns and better position itself to compete with its traditional competitors and also with newer, nontraditional competitors, such as Airbnb Inc.

Most of this expansion has been through franchise operations. Franchise agreements are contracts that enable individuals to create a business establishment under the branding of an existing company. This often requires upfront fees, but enables individuals to take advantage of the parent company's network, branding and other features. While these establishments are considered independent enterprises, they have increased Marriott's operations across the United States.

Due to the nature of Marriott's business structure, with its focus on management, franchising and licensing,

IBISWorld uses company reported revenue from owned and leased locations to project the company's market share.

However, IBISWorld also reports and estimates total network sales. Network sales further include revenue generated by the company's franchise operations. In 2021,

Marriott is expected to generate $509.3 million in industry-relevant revenue. This includes an estimated decline in 2020 due to the COVID-19 (coronavirus) pandemic as domestic and

Market Feasibility

international travel sharply contracted amid travel restrictions and stay-at-home mandates. In 2021, the company is anticipated to experience a rebound in demand, driven primarily by robust leisure demand.

Hilton Worldwide Holdings Inc.

Market Share: 0.2%

Brand Names: Hilton, Hilton Garden Inn, Doubletree, Embassy Suites, Hampton, Homewood Suites by Hilton, Conrad

Hilton Worldwide Holdings Inc. (Hilton), formerly Hilton Hotels Corporation, is a McLean, VA-based lodging company that owns, manages or franchises more than 6,500 hotels with over 1.0 million rooms worldwide.

An estimated 71.0% of Hilton's rooms are based in the United States, which has increased over the five years to 2021. Hilton employs 141,000 people worldwide at its managed, owned, leased and corporate locations, while 173,000 individuals work in the company's franchised locations.

Hilton has undergone a series of ownership changes since it was first listed on the New York Stock Exchange in 1970. Most recently, the company was purchased by private equity firm Blackstone Group Inc. (Blackstone) in 2007 for $26.0 billion, initially pulling it off of public exchanges.

Blackstone took Hilton public again in late 2015, listing the company on the New York Stock Exchange under the name of Hilton Worldwide and using the proceeds to pay down the substantial debt the group had taken on during the initial purchase of Hilton. During its ownership tenure,

Blackstone increased the chain's room count, which was mainly achieved through franchised and managed hotels, which require limited capital investment. In February 2016, the company announced plans to break into three separate entities to capitalize on growth opportunities, increase its competitiveness within the Hotels and Motels industry and create internal efficiencies that would enable its core segments to act on opportunities faster than before. These spin-offs were completed in early 2017. The two new segments include Park Hotels & Resorts Inc. and Hilton Grand Vacations Inc. These segments comprised the company's previous timeshare rentals and various resorts segments. The company's remaining portfolio is focused on luxury and lifestyle hotel brands, with global properties remaining within the traditional company structure.

In 2021, Hilton is estimated to generate $219.5 million in industry-relevant revenue. This does not include revenue from its franchised operations, as Hilton does not release revenue figures for its franchised and managed locations in its publicly available financials.

The company's continued shift toward franchising has been a large driver behind its declining industry-relevant revenue. The company's revenue is expected to decline in 2020 due to the negative effect of COVID-19 (coronavirus) pandemic. However, based on

Market Feasibility

RevPAR figures and the company's reported number of rooms to determine its total system-wide sales, IBISWorld estimates that Hilton's US system-wide sales have grown throughout most of the five years to 2021, prior to the coronavirus pandemic, and system-wide sales remain important to Hilton's growth post-pandemic.

Moreover, Hilton is anticipated to experience an increase in demand in 2021 amid the easing of travel restrictions and anticipated pent-up travel demand amid the broader distribution of the coronavirus vaccination.

InterContinental Hotels Group PLC

Brand Names: InterContinental

InterContinental Hotels Group PLC (IHG) is a UK-based company and one of the largest hotel chains in the world as measured by total number of rooms. IHG owns, manages and franchises 5,964 hotels throughout 100 countries under major brands, including Holiday Inn, Kimpton Hotels, Crowne Plaza and InterContinental. It also employs more than 400,000 individuals across all hotels and countries. IHG divides its hotels into segments based on ownership and management structures. Hotels are either franchised, managed or owned.

Consistent with IHG's low-asset business model, most of the company's hotels operate under a franchise agreement or are managed by IHG on behalf of the owner. Due to the low capital investment and minimal wage costs required for franchising, the company's franchise business is its most profitable segment.

IHG's portfolio of brands covers a wide range of key consumer segments active in the Hotels and Motels industry. High-end luxury travelers visiting major cities are catered to by IHG's five-star InterContinental locations, while its Holiday Inn brand accommodates mid-market consumers traveling for business or leisure.

IHG's most recent project, Hotel Indigo, is a boutique hotel concept with 50 locations that targets travelers with a preference for edgy art and design. These locations are predominantly located in urban areas and target high-end consumers between the ages of 20 and 50. RevPAR for all of IHG's brands has increased strongly during most of the period, as travel across all major markets has increased.

Similar to other service industries, IHG was heavily affected by the onset of the COVID-19 (coronavirus) pandemic in the United States and throughout the globe.

As people self-isolated and sheltered in place, they canceled travel plans, and thus, did not book stays at hotels and motels, causing sharp declines in occupancy rates in 2020.

However, in 2021 IHG has experienced a recovery in its occupancy rates, which has been skewed toward domestic leisure markets where restrictions have been lifted. IHG's business market occupancy levels have remained an estimated 30.0% below pre-pandemic levels.

Market Feasibility

IHG's industry-relevant hotels are located within the company's Americas segment, which includes all properties located in North, South and Central America. The Americas segment represents over 4,200 hotels and 514,000 rooms. Properties located in the United States represent an estimated 58.0% of total properties.

While the United States still accounts for the majority of revenue within the Americas segment, Canada, Mexico and the Caribbean are also key players that significantly contribute to the company's profit, mainly because more than 90.0% of rooms in the Americas segment operate under a franchise business model.

IHG's asset-light business model means it owns nine hotels, as most hotels operate under a franchise agreement or are managed by IHG on behalf of owners. Additionally, the global effect of coronavirus is forecast to substantially affect the industry, further reducing growth.

Nonetheless, IHG experienced significant growth during the most of the period, which is expected to somewhat mitigate loss that has been incurred in 2020.

Therefore, the company is expected to generate $4.5 million in industry-relevant revenue in 2021. The figure is relatively low because industry-relevant revenue does not include franchise revenue, as franchises are considered independent operators, according to the Bureau of Labor Statistics.

Nonetheless, IHG's total network sales in the United States, which includes sales garnered from owned, leased and managed hotels and sales earned by third-party-owned franchised hotels, are estimated to fall over the five years to 2021 due to the coronavirus pandemic induced decline in 2020.

Wyndham Hotel and Resorts

Brand Names: Super 8 Motels, Knights Inn, Days Inn, Travelodge

Wyndham Hotels and Resorts (Wyndham), previously Wyndham Worldwide Corporation, is based in Parsippany, NJ, but operates globally. Wyndham is one of the largest franchised-hotel operators in the United States. In 2006, its parent company, Cendant Corporation, split into discrete companies operating in specific industries, and its hotel operation was renamed Wyndham Worldwide.

During the second quarter of 2017, the company decided to further divide the company, and announced its intent to spin-off of the hotel business segment. This spin-off was completed in June 2018 and resulted in the hotel business operation being held as its own publicly traded entity named Wyndham Hotel and Resorts. Wyndham states that the spin-off aimed to enable a greater focus on the individual functions of each business segment, enhancing their potential for success and growth.

In the United States, Wyndham has 8,941 properties with a total of 484,800 rooms. In 2021, IBISWorld estimates that Wyndham will derive 60.8% of its revenue in the United States.

Market Feasibility

Wyndham's brands include Days Inn, Knights Inn, Ramada, RCI, Super 8 Motels, Travelodge, Howard Johnson's and Wingate by Wyndham. Its two largest brands, Super 8 and Days Inn, have an estimated 2,000 locations each.

Wyndham's brands mainly cater to the economy and midscale markets. It is also involved in the timeshare market via its RCI and Fairfield Communities brands.

Wyndham earns one of the lowest RevPARs in the industry due to the budget-focused nature of its lodgings.

In 2021, Wyndham is expected to generate $2.9 million in industry-relevant revenue. This does not include revenue generated by the company's franchised establishments.

US-network sales have fallen over the five years to 2021. This is largely due to an anticipated decline in 2020, as many consumers throughout the globe and in the United States were placed under stay-at-home orders, and significantly reduced and canceled most traveling. However, in 2021,

Wyndham has benefited from strong demand from its business customers, which largely are comprised of truckers, contractors, construction workers, healthcare workers and others who must travel for work and do not have the ability to conduct their work remotely.

Consequently, the company's economy and midscale brands have outperformed the industry's higher-end brands during the pandemic. Moreover, leisure travel demand has recovered strongly in 2021, with occupancy rates reaching 95.0% of their pre-pandemic levels during the second quarter of 2021.

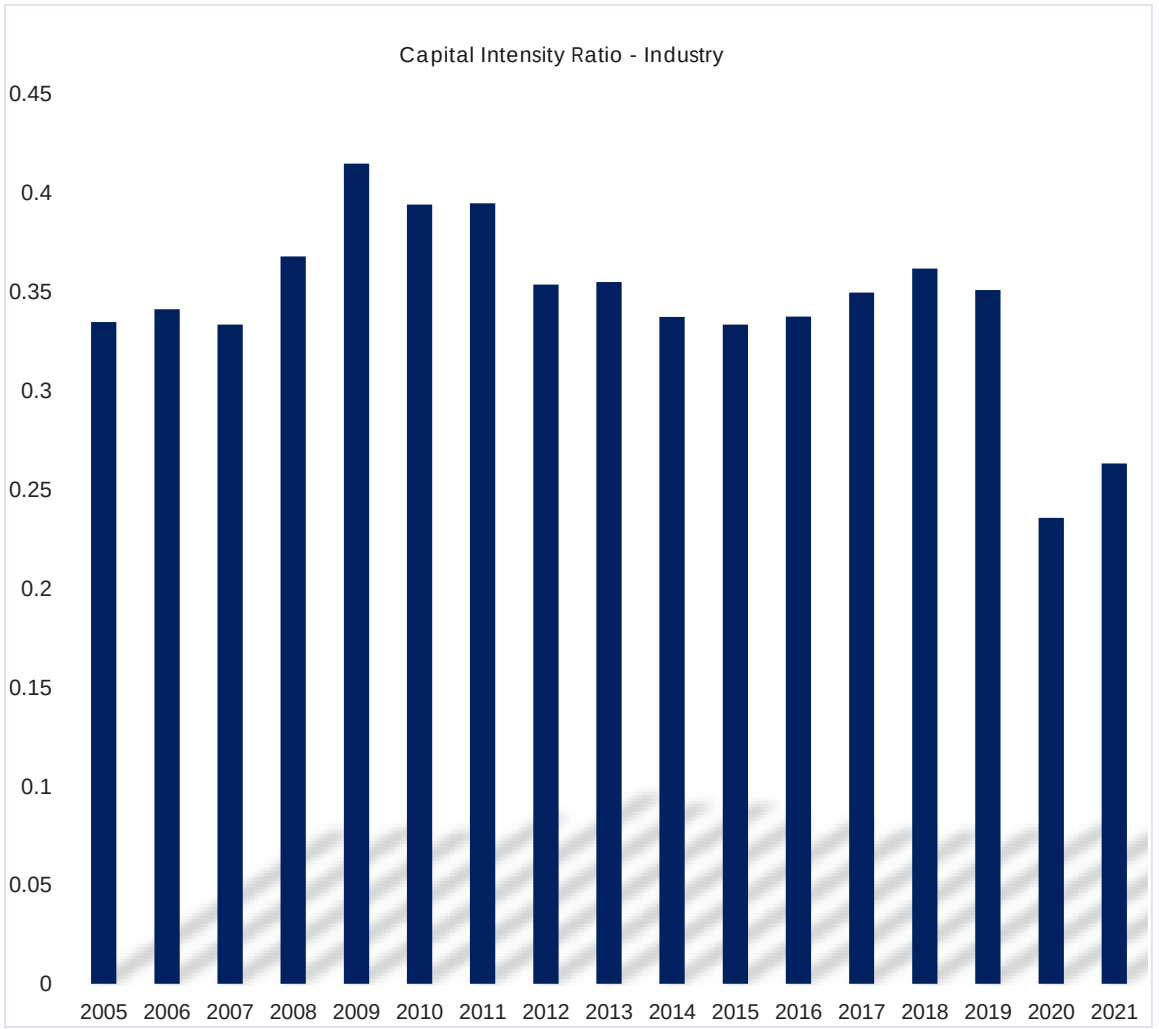
Market Feasibility

Operating Conditions

The level of capital intensity is Medium

The Hotels and Motels industry is subject to a moderate to level of capital intensity. In 2021, for every $1.00 spent on wages, the average industry operator is expected to spend an estimated $0.26 on capital. Capital intensity is expected to remain stable moving forward as labor and capital both play an important role in the industry.

As a service-based industry, hotel and resort operators are highly dependent on direct labor input across all areas of operation. Individuals are needed in areas such as front-desk service, reservations, room service and cleaning, food preparation, liquor and beverage service and back of house operational management. Due to the service-based nature of the industry, many of these labor-intensive functions cannot be substituted by technology or machinery and are a key foundation in the day-to-day functions. To meet customers' expectations of quality and provide a hospitable stay, trained staff are required.



Market Feasibility

Revenue Volatility

The level of volatility is Very High

Over much of the five years to 2021, Hotels and Motels industry revenue volatility has been moderate to very high.

Volatility was low during most of the period due to the consistent growth industry operators have been able to capitalize on. However, with the onset of the COVID-19 (coronavirus) pandemic, industry revenue is anticipated to rapidly decline in 2020 and strongly rebound in 2021, introducing greater volatility to the industry.

Industry revenue grew as much as 42.9% in 2021 and declined as much as 55.8% in 2020. Prior to 2020, there was little variability. However, this new instability in revenue growth derived from global economic and public health issues has affected the United States in 2020.

This has led to steep declines in the previously steady increase in inbound tourism, volumes of domestic travel and general weakening of economic conditions. The introduction and spread of coronavirus in the United States caused implementations of travel bans, limited domestic travel and a downturn in the US economy. However, revenue is estimated to rebound in 2021 in line with the cessation of domestic travel restrictions and an increase in the percentage of the domestic population which has been vaccinated. This moderate to high level of volatility is still subject to change if economic conditions change over the five years to 2026, especially as the effect of the virus is fully realized.

Regulation & Policy

The level of regulation is Medium and this trend is Steady.

The Hotels and Motels industry is subject to a medium and steady level of regulation at the federal and state level.

Several states regulate the activities of hospitality properties and restaurants, including safety and health standards, and the sale of liquor, by requiring licensing, registration, disclosure statements and compliance with specific standards of conduct. There are also extensive state and federal laws and regulations relating to selling and marketing timeshare intervals for those hotels that offer such arrangements.

LABOR RELATIONS

Operators of hotels and motels are also subject to laws governing their relationship with employees, including minimum wage requirements, overtime, working conditions and work permit requirements.

The industry employs a high number of young and low-skilled workers at hourly rates, and therefore, is subject to minimum wage and employee benefits regulations.

Workers in the United States are entitled to be paid no less than the statutory minimum wage, which is $7.25 per hour in 2021. Each state also formulates and regulates its own minimum

Market Feasibility

wage, with most states implementing rates higher than the federal rate. National operators that have establishments in various states must comply with each individual state's requirements for each location.

Food Safety And Standards

As many hotels and motels prepare and sell food on premises, the industry is subject to laws and regulations relating to the preparation and sale of food, including regulations regarding product safety, nutritional content and menu labeling.

The Food and Drug Administration (FDA) is the main agency responsible for providing guidance and regulation. The FDA's Model Food Code, which is a best-practice guide to food handling and presentation, applies to this industry and is updated each year.

The FDA Nutritional Value applies as well. Since 1996, the FDA regulations have set standards for nutritional values of individual foods and meals. If claims such as "low-fat" or "heart-healthy" are on a menu, an owner must be able to demonstrate to officials that there is a reasonable basis for the claim.

For instance, the meal may be based on a recipe from a health association or a recognized dietary group. Complete nutritional information, however, is not required to be on menus.

The Affordable Care Act requires restaurant companies to disclose calorie information on their menus.

The Food and Drug Administration has proposed rules to implement this provision that would require restaurants to post the number of calories for most items on menus or menu boards and to make available more detailed nutrition information upon request. FDA regulations require that restaurants and similar retail food establishments that are part of a chain with 20.0 or more locations are required to provide nutrition information for standard menu items on menus and menu boards.

However, during the coronavirus pandemic the FDA has granted restaurants flexibility in implementing these changes and will not object if establishments do not meet labeling requirements during the public health emergency.

Liquor Licensing

A license is required to serve liquor and the issuing of licenses may be restricted in some states, such as limiting the number of licenses in a given area or by population.

For example, in Wisconsin, there is a license quota of one license per 500 people. Additionally, states are able to mandate hours of operation, the price of each drink, which establishments are able to serve and how long an unfinished bottle of wine may be used in the bar. Hotel and motel operators must comply with state and local service laws, commonly called dram shop statutes. Dram shop statutes generally prohibit serving alcoholic beverages to certain persons such as an individual who is

Market Feasibility

intoxicated or a minor. In the United States, a person must be 21 years of age to be legally served alcohol, which has been in place since the passing of the National Minimum Drinking Age Act of 1984

Cybersecurity

After Wyndham Hotels and Resorts experienced a breach in its data systems, the Federal Trade Commission (FTC) has increased its powers and regulations on cybersecurity.

While no regulation has yet to be passed that outlines exactly the level of cybersecurity a hotel or motel must have, it has become increasingly pertinent. The FTC can still fine an operator if they experience a high-level security breech. This increases the need for hotels and motels to implement high level of data security.

Smoking Bans

Smoking laws are generally enforced at the state level as the US Congress has not attempted to enact any nationwide federal smoking ban.

Smoking is banned in restaurants, bars and non hospitality workplaces in many states and some local jurisdictions ban smoking in outdoor areas. Each jurisdiction has developed legislation separately; however, most laws are relatively consistent.

There are some differences pertaining to the circumstances in which ventilated smoking rooms are permitted and the distance smoking is banned outside a building.

A growing number of cities and states now require hotels to be 100.0% smoke-free indoors, including guest rooms. Currently, all hotels and motels, including guest rooms, must be smoke-free in Wisconsin, Michigan and Nebraska.

Over the past decade, smoke-free hotels have gone from being almost nonexistent to the national norm. The Westin, a Marriott International Inc. (Marriott) brand, announced the first national 100.0% smoke-free hotel policy for all its properties in the United States in 2006 following a report from the Surgeon General that exposure to secondhand smoke is damaging to health. This marked a turning point for the industry and a domino effect led Marriott to adopt a similar policy across its portfolio of brands.

Franchising Laws

A large proportion of industry establishments are operated under franchise agreements.

There are both federal and state laws governing franchising, which vary from state to state. Franchising is regulated at the federal level by the US Federal Trade Commission and applied in any region within the United States. At the state level, various state agencies regulate franchises and laws vary between states.

A state's franchise laws usually only apply if the sale of a franchise is made in the state and the business is located in the state. Laws generally fall into three categories, which include disclosure laws, registration laws and relationship laws.

Market Feasibility

Under the FTC Franchise Rule there are three elements of a franchise, which include the franchise has a trademark under which the franchisee is given the right to distribute goods and services; the franchisor has significant control of or provides significance to the franchisee's method of operation; and the franchisee is required to pay the franchisor at least $600.00 within the first six months of opening for business.

COVID-19

In early 2020, the United States was affected by the global COVID-19 (coronavirus) pandemic.

While many industries have been affected heavily by this pandemic, industries related to hospitality and tourism have been hit especially hard due to travel bans and stay-at-home restrictions.

There has been no direct legislation on hotels and motels in the United States, however, there has been broad sweeping regulation that affected industry operators and employees.

This included the Families First Coronavirus Response Act. This act required specified employers to provide their employees with paid sick leave or expanded family and medical leave for specified reasons related to coronavirus.

This regulation likely affected operators that fell under the designated categories specified by the act. However, the FFCRA leave requirements expired December 31st, 2020. In 2021, operators still are contending with regulations such as the limitation of foreign travelers into the United States. For example, as of August, U.S. borders remain closed to most European travelers, even those with vaccinations.

Industry Assistance

The level of industry assistance is Low and the trend is Increasing

As a whole, the Hotels and Motels industry does not receive on-going and continuous direct support from local or state governments.

In early 2020, however, many hotel and motel operators were given stimulus in the form of money from the US government due to the COVID-19 (coronavirus) pandemic.

The US Coronavirus Aid, Relief, and Economic Security (CARES) Act, which was introduced and signed into law in March 2020, is a $2.0 trillion economic relief package designed to provide direct economic assistance for American workers, families and small businesses as well as preserve jobs for American industries. The Paycheck Protection Program (PPP), which was established by the CARES Act, is implemented by the Small Business Administration (SBA) and provides small businesses with funds to pay up to eight weeks of payroll costs including benefits.

Funds can also be used to pay interest on mortgages, rent and utilities. Furthermore, in December 2020, the government passed an additional $900.0 billion in a COVID-19 (coronavirus) relief bill. The legislation included another $300.0 billion for the PPP and

Market Feasibility

expanded the kinds of businesses that can qualify for forgivable loans and grants. Lastly, in March 2021, a third, $1.9 trillion coronavirus relief plan was signed into law.

The plan provides $15.0 billion to the Emergency Injury Disaster Loan program, which provides long-term, low-interest loans from the SBA. Moreover, the PPP will receive an additional $7.0 billion in funds under this relief plan.

Many industry operators were severely affected by the coronavirus pandemic as travel from many international locations was suspended for months and domestic travel declined as people were ordered to quarantine and self-isolate at home throughout most of the United States.

Aside from direct stimulus provided on rare occasions, the industry receives other indirect assistance regularly. In many states, some of the funds collected by lodging taxes are spent on promoting local tourism, which can directly and indirectly benefit the Hotels and Motels industry. This tax is often used to promote tourism within the state. Thus, the industry is an indirect beneficiary of any promotional tourism spending by governments, to which operators may or may not have contributed funds. The more local tourism is promoted, the more likely people might be to travel to that location which typically benefits the region's overall economy.

Trade groups such as the American Hotel & Lodging Association also lobby on the industry's behalf. This is the sole national association that represents all components of the lodging industry. This association includes individual hotel property members, hotel companies, training organizations, students and suppliers. Its activities incorporate national advocacy, public relations and image management, education and research and information. It also operates through 43 partner state associations to provide local representation to members.

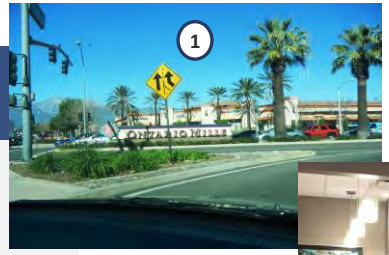
Nature and Extent of the Market and Market Area

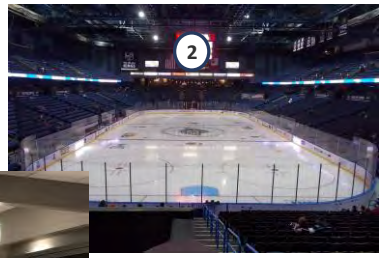
VERITAS | DEVELOPMENT ADVISORS

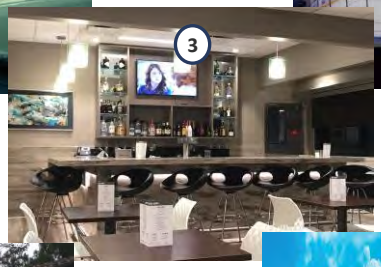
Market Feasibility

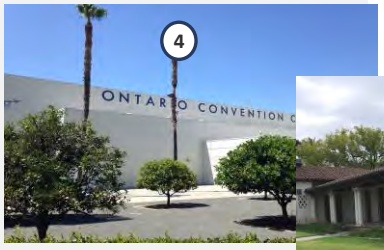
Top 10 things to do in Ontario, CA (per TripAdvisor)

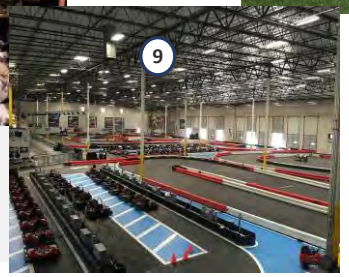
No	Name
1	Ontario Mills
2	Toyota Arena
3	Escape Lounge
4	Ontario Convention Center
5	Museum of History and Art, Ontario
6	Animanga
7	Cucamonga-Guasti Regional Park
8	Treasures N Junk
9	K1 Speed Ontario
10	Scandia









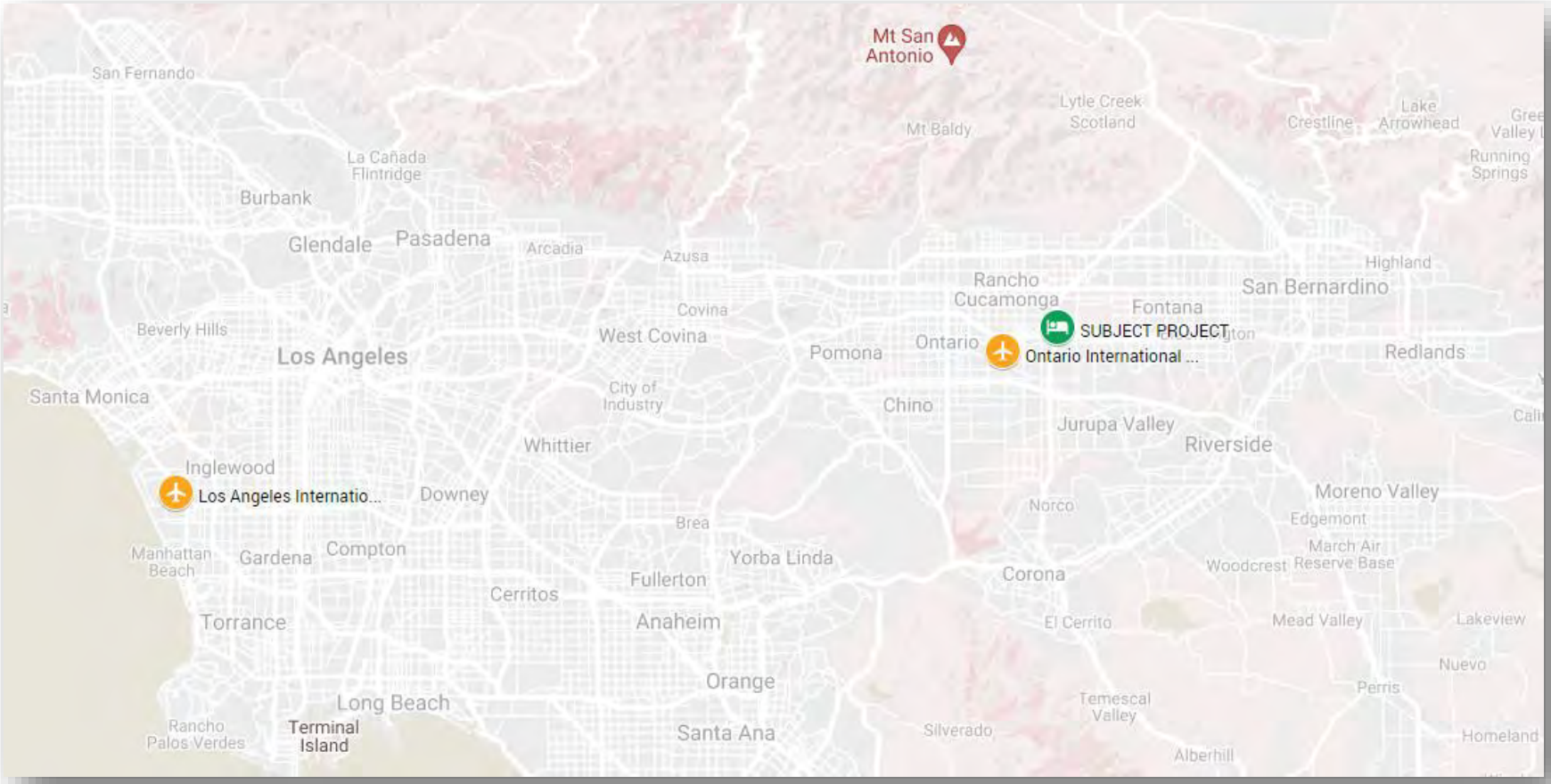


Source: Veritas Development Advisors Primary Research

Market Feasibility

Major Airports Near the Subject Project Data Table and Map

No.	Name	Address	Miles Away from the Subject Project
1	Ontario International Airport	Ontario, CA 91761	3.2
2	Los Angeles International Airport	1 World Way, Los Angeles, CA 90045	58.5

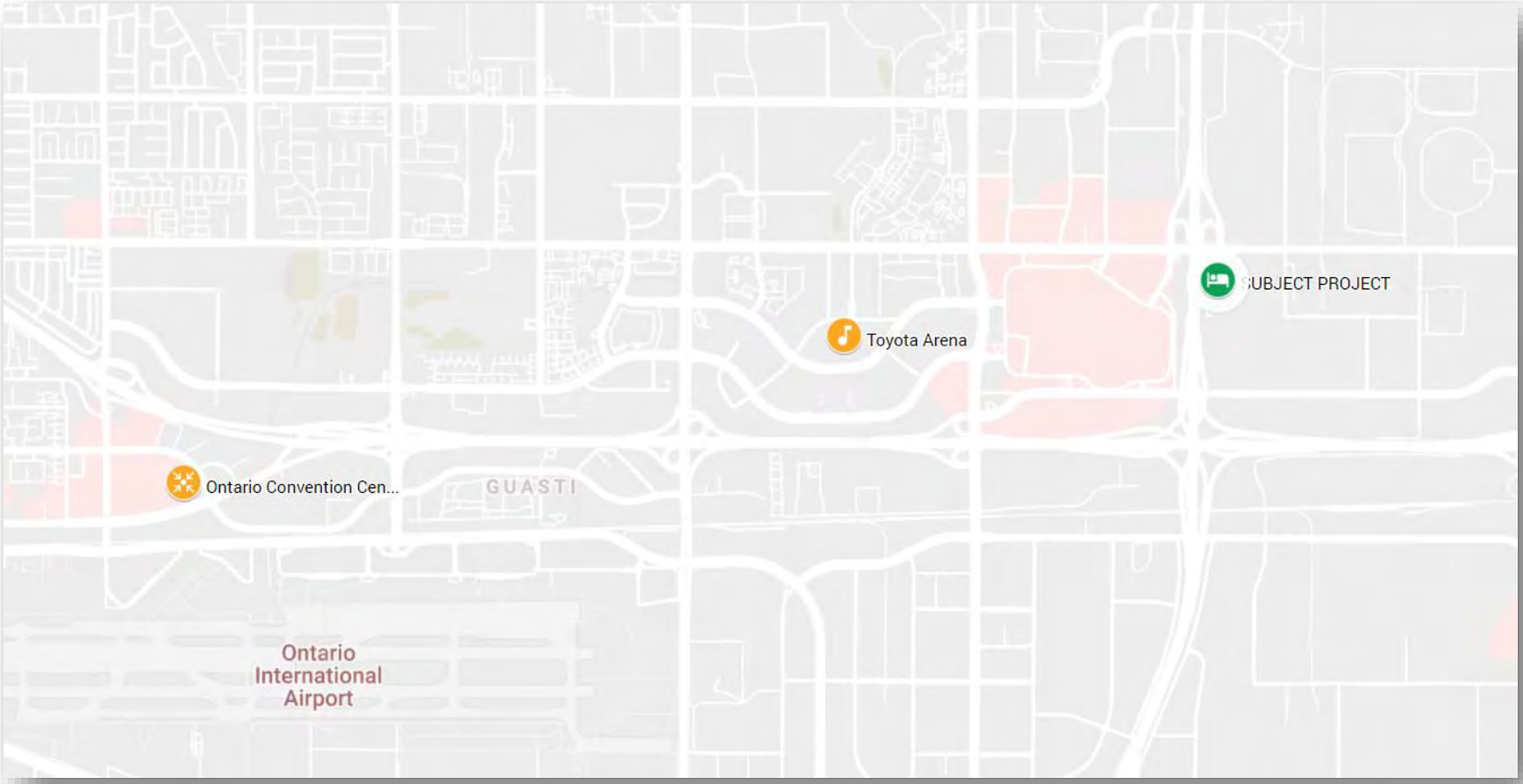


Source: Google Maps, Veritas Development Advisors Primary Research Analysis

Market Feasibility

Significant Demand Generators Near the Subject Project Data Table and Map

No.	Name	Address	Miles from Subject Project	Overnight Stays Demanded Annually
1	Toyota Arena	4000 Ontario Center, Ontario, CA	1.6	Left voice msg with Ontario Econ. Dev.
2	Ontario Convention Center	2000 E Convention Center Way, Ontario, CA	4.9	Left voice msg with Ontario Econ. Dev.



Source: Google Maps, Veritas Development Advisors Primary Research Analysis

Market Feasibility

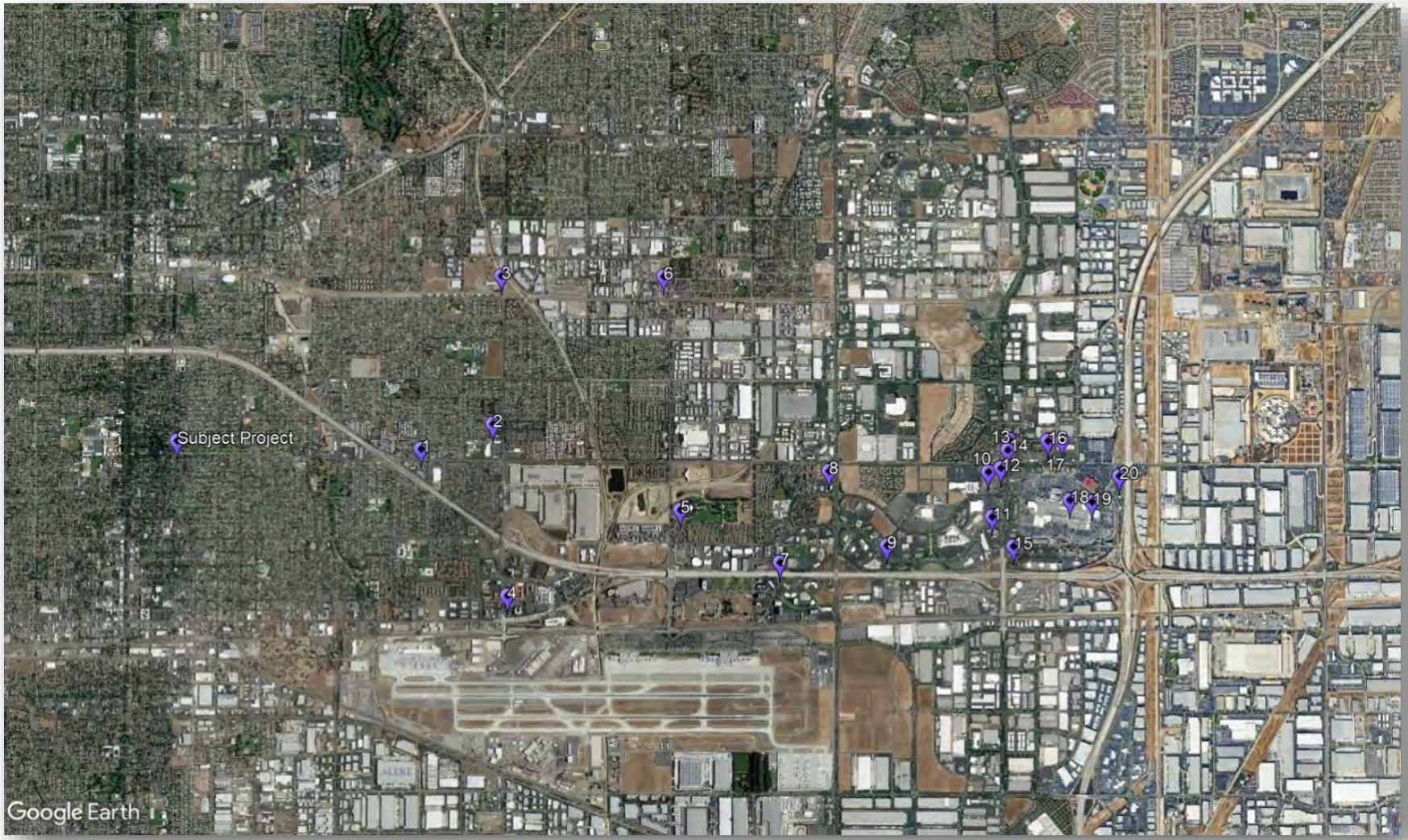
Restaurants Near the Subject Project Data Table

No.	Name	Address	Miles Away from the Subject Project
1	El Chilitos Mexican Restaurant	1630 E 4th St K, Ontario, CA 91764	1.49
2	Zeke's Eatin' Place	1855 E 4th St, Ontario, CA 91764,	1.92
3	Johnny O's Café	8890 8th St, Rancho Cucamonga, CA 91730	2.20
4	Spires Restaurant	104 N Vineyard Ave, Ontario, CA 91764	2.25
5	Ontar Thai Restaurant	750 Archibald Ave, Ontario, CA 91764	3.10
6	Chasqui	8880 Archibald Ave, Rancho Cucamonga, CA 91730	3.12
7	Panda Inn	3223 E, N Centre Lake Dr, Ontario, CA 91761	3.77
8	Jikan Japanese Restaurant	3495 Concours St suite e, Ontario, CA 91764	3.97
9	Benihana	3760 Inland Empire Blvd, Ontario, CA 91764	4.39
10	@ Home Thai Fusion bistro	4275 Concours St Suite 130, Ontario, CA 91764	4.93
11	Chili Bistro-湘巴佬	765 N Milliken Ave ste a, Ontario, CA 91764	4.98
12	Applebee's Grill + Bar	1021 N Milliken Ave, Ontario, CA 91764	5.02
13	Olive Garden Italian Restaurant	4403 Mills Cir, Ontario, CA 91764	5.07
14	Big Wok Mongolian Grill BWRC	11334 Fourth St Ste 103, Rancho Cucamonga, CA 91730	5.08
15	In-N-Out Burger	4310 Ontario Mills Pkwy, Ontario, CA 91764	5.13
16	BJ's Restaurant & Brewhouse	11520 Fourth St, Rancho Cucamonga, CA 91730	5.28
17	Lazy Dog Restaurant & Bar	11560 Fourth St, Rancho Cucamonga, CA 91730	5.40
18	The Sweet Spot	Ontario, CA 91764	5.45
19	Rainforest Café	4810 Mills Cir, Ontario, CA 91764	5.59
20	Rubio's Coastal Grill	980 Ontario Mills Dr Suite A, Ontario, CA 91764	5.71

Source: Google Map, Veritas Development Advisors Primary Research Analysis

Market Feasibility

Restaurants Near the Subject Project Map



Source: Google Map, Veritas Development Advisors Primary Research Analysis

Market Feasibility

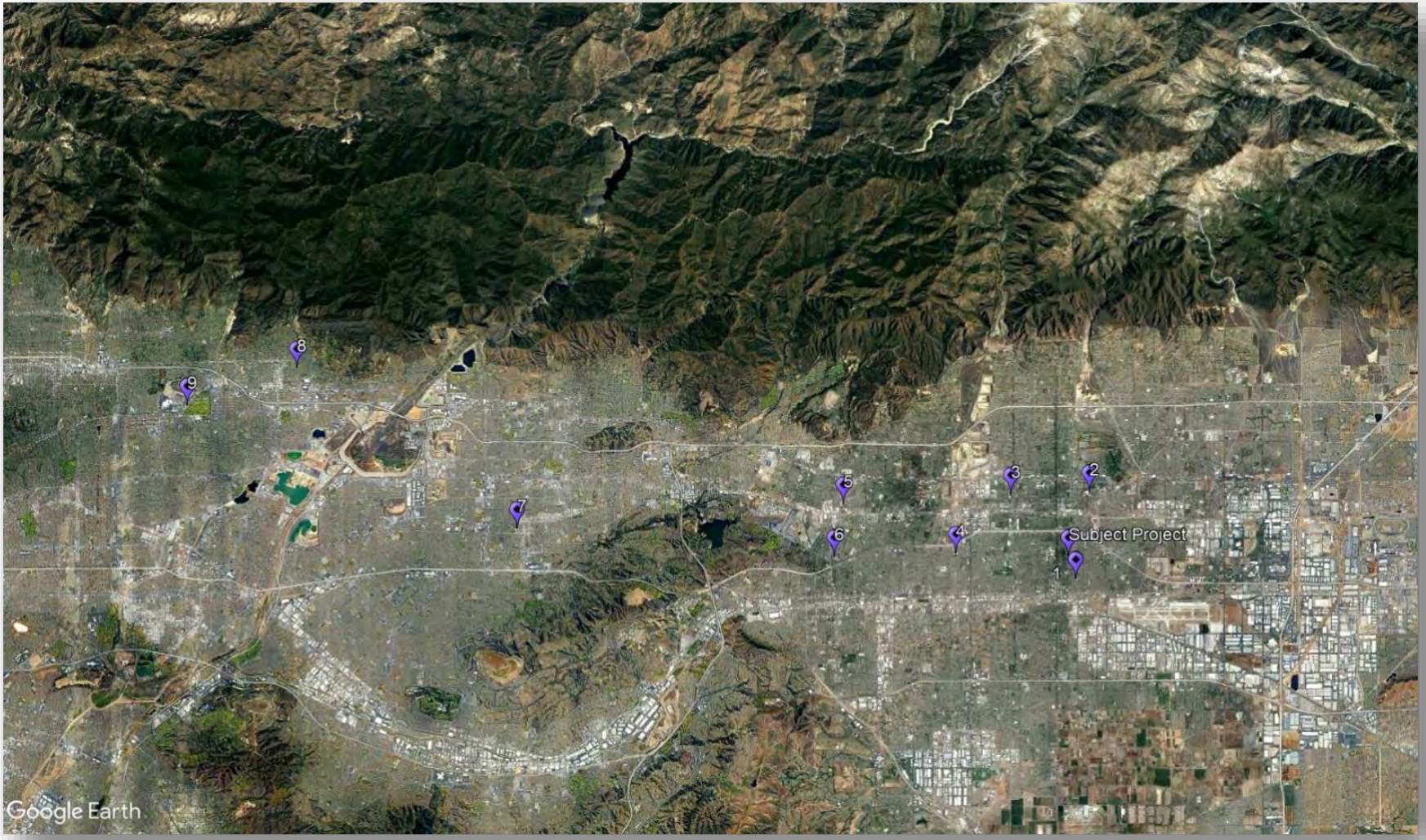
Medical Facilities Near the Subject Project Data Table

No.	Name	Address	Miles Away from the Subject Project
1	Kindred Hospital Ontario	550 N Monterey Ave, Ontario, CA 91764	0.71
2	San Antonio Regional Hospital	999 San Bernardino Rd, Upland, CA 91786	1.66
3	Chaparral Medical Group	585 N Mountain Ave, Upland, CA 91786	2.09
4	Montclair Hospital Medical Center	5000 San Bernardino St, Montclair, CA 91763	2.87
5	Casa Colina Hospital and Centers for Healthcare	255 E Bonita Ave, Pomona, CA 91767	5.70
6	Pomona Valley Hospital Medical Center	1798 N Garey Ave, Pomona, CA 91767	6.10
7	Emanate Health Inter-Community Hospital	210 W San Bernardino Rd, Covina, CA 91723	14.18
8	Monrovia Memorial Hospital	323 S Heliotrope Ave, Monrovia, CA 91016	20.05
9	Methodist Hospital	300 Huntington Dr, Arcadia, CA 91007	22.54

Source: Google Map, Veritas Development Advisors Primary Research Analysis

Market Feasibility

Medical Facilities Near the Subject Project Map



Source: Google Map, Veritas Development Advisors Primary Research Analysis

Market Feasibility

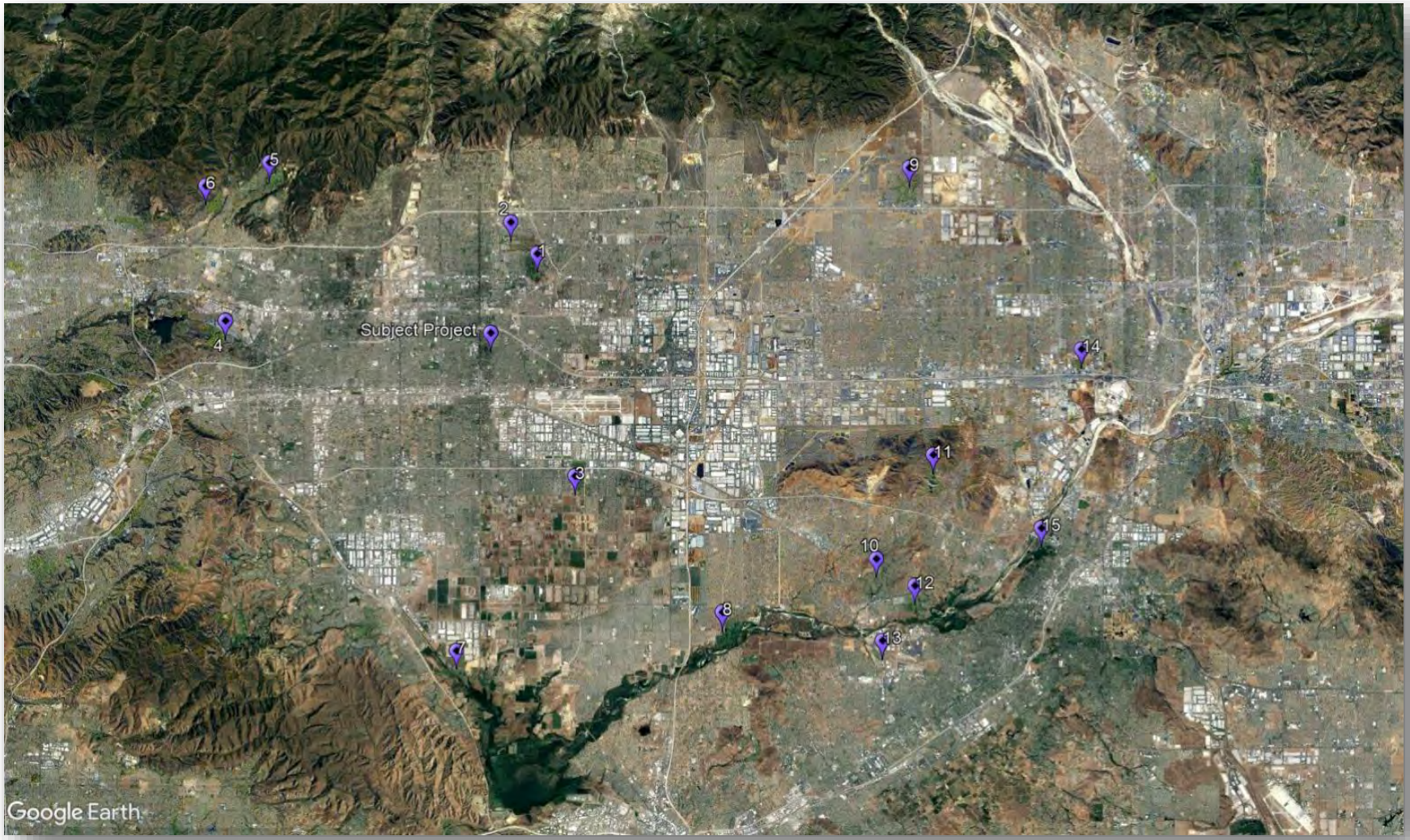
Golf Courses Near the Subject Project Data Table

No.	Name	Address	Miles Away from the Subject Project
1	Red Hill Country Club	8358 Red Hill Country Club Dr, Rancho Cucamonga, CA 91730	2.09
2	Upland Hills Country Club	1231 E 16th St, Upland, CA 91784	2.60
3	Whispering Lakes Golf Course	2525 E Riverside Dr, Ontario, CA 91761	5.23
4	Mountain Meadows Golf Course	1875 Fairplex Dr, Pomona, CA 91768	7.37
5	Marshall Canyon Golf Course	1135, 6100 Stephens Ranch Rd, La Verne, CA 91750	7.45
6	San Dimas Canyon Golf Course	2100 Terrebonne Ave, San Dimas, CA 91773	8.69
7	El Prado Golf Courses	6555 Pine Ave, Chino, CA 91708	9.61
8	Goose Creek Golf Club	11418 68th St, Mira Loma, CA 91752	10.72
9	Sierra Lakes Golf Club	16600 Clubhouse Dr, Fontana, CA 92336	12.41
10	Indian Hills Golf Club	5700 Club House Dr, Riverside, CA 92509	12.79
11	Oak Quarry Golf Club	7151 Sierra Ave, Riverside, CA 92509	12.96
12	Jurupa Hills Country Club	6161 Moraga Ave, Riverside, CA 92509	14.13
13	Van Buren Golf Center	6720 Van Buren Boulevard, Riverside, CA 92503	14.28
14	Colton Golf Course	1901 W Valley Blvd, Colton, CA 92324	16.49
15	Fairmount Golf Course	2681 Dexter Dr, Riverside, CA 92501	16.51

Source: Google Map, Veritas Development Advisors Primary Research Analysis

Market Feasibility

Golf Courses Near the Subject Project Map



Source: Google Map, Veritas Development Advisors Primary Research Analysis

Market Feasibility

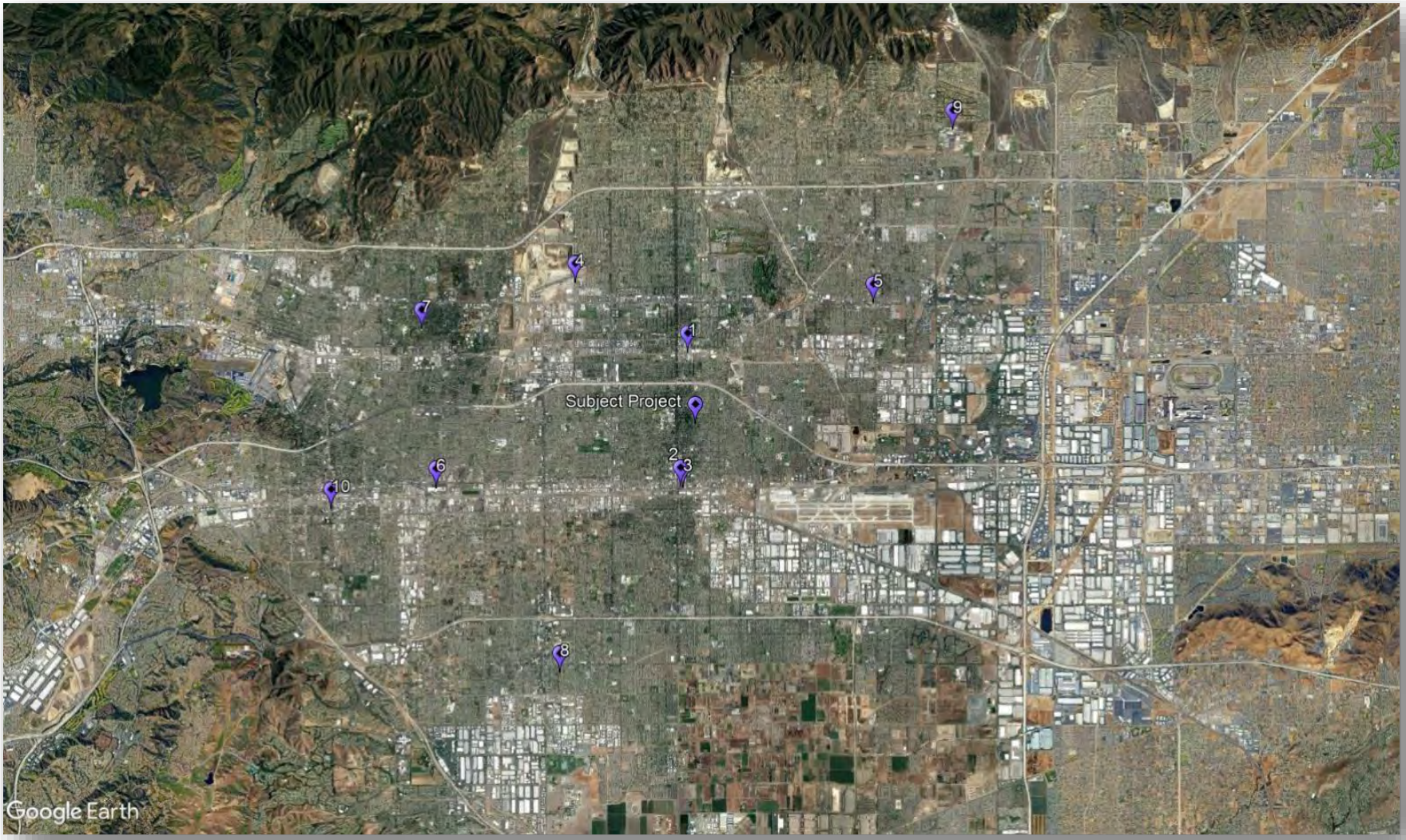
Museums Near the Subject Project Data Table

No.	Name	Address	Miles Away from the Subject Project
1	Cooper Regional History Museum	217 E A St, Upland, CA 9178	0.82
2	Ontario Museum of History & Art	225 Euclid Ave, Ontario, CA 91762	1.48
3	Chaffey Community Museum of Art	217 S Lemon Ave, Ontario, CA 91761	1.49
4	Sasse Museum of Art	1334 N Benson Ave STE D, Upland, CA 91786	2.79
5	Cucamonga Service Station	9670 Foothill Blvd, Rancho Cucamonga, CA 91730	3.38
6	The African-American Museum of Beginnings	1460 E Holt Ave Suite 188, Pomona, CA 91767	4.56
7	Petterson Museum of Intercultural Art	730 Plymouth Rd, Claremont, CA 91711	4.70
8	Chino's Old Schoolhouse Museum	5493 B St, Chino, CA 91710	5.19
9	Wignall Museum & Gallery	5885 Haven Ave, Rancho Cucamonga, CA 91737	6.19
10	Latino Art Museum	281 S Thomas St, Pomona, CA 91766	6.31

Source: Google Map, Veritas Development Advisors Primary Research Analysis

Market Feasibility

Museums Near the Subject Project Map



Source: Google Map, Veritas Development Advisors Primary Research Analysis

Market Feasibility

4th Street Hotel **(Subject Project)**

Site Info	
Location	5060 E. 4th Street, Ontario, California 91764
Rooms	128 (planned)
Room Types	61 Queen Suites 61 DBL Queen Suites 3 ADA DBL Queen Suites 3 ADA Queen Suites
Site Area	• 80,000 sq. ft
GBA	• 55,250 sq. ft
Story	• Four
Parking Area	• 19,106 sq. ft
Meeting Room	• 1,824 sq. ft
Seating Area	• 300 sq. ft
Café/Snack	• 331 sq. ft
Fitness	• 331 sq. ft
Pool Deck/Spa	• 2,353 sq. ft
Lobby	• 504 sq. ft
Reception	• 110 sq. ft
Laundry	• 437 sq. ft

SUITE AMENITIES INCLUDE

Spacious Kitchens

- Stove
- Microwave Oven
- Toaster
- Refrigerator (Full)
- Icemaker In Refrigerator
- Dishwasher
- Pots/Pans/Serving Dishes
- Plates/Glassware
- Silverware
- Dining Table

Flexible Workspaces

- Work Desk With Lamp
- Desk Level Electrical Outlet
- Spare Electrical Outlet at Desk

Connectivity

- Wired Internet Available in Rooms, Suites, Business Center, Public Areas and Meeting Convention Spaces.
- Wireless Internet Available in Rooms, Suites, Business Center, Public Areas and Meeting Convention Spaces.
- Standard Wireless Internet service is free for all members
- Two-Line Phone
- Phone with Voicemail

HOTEL AMENITIES INCLUDE

Connectivity

- Wired Internet Available in Rooms, Suites, Business Center, Public Areas and Meeting Convention Spaces.
- Wireless Internet Available in Rooms, Suites, Business Center, Public Areas and Meeting Convention Spaces.

Housekeeping and Laundry Services

- On-site Guest Self-Laundry Facilities
- Weekly Housekeeping
- Housekeeping Full Service
- Full service - complete room clean.

Market Feasibility

Business Services

- On-Site Business Center
- Business Services are available
- Copying
- Office supplies available
- Printer
- Scanner

Entertainment and Recreation

On-site Fitness Center Available

- Limited Offering
- Available Equipment: Elliptical Machines, Treadmill, Free Weights, Stationary Bicycle

Outdoor Pool Available

- Outdoor Gazebo Grill

Competitive Market Area Analysis

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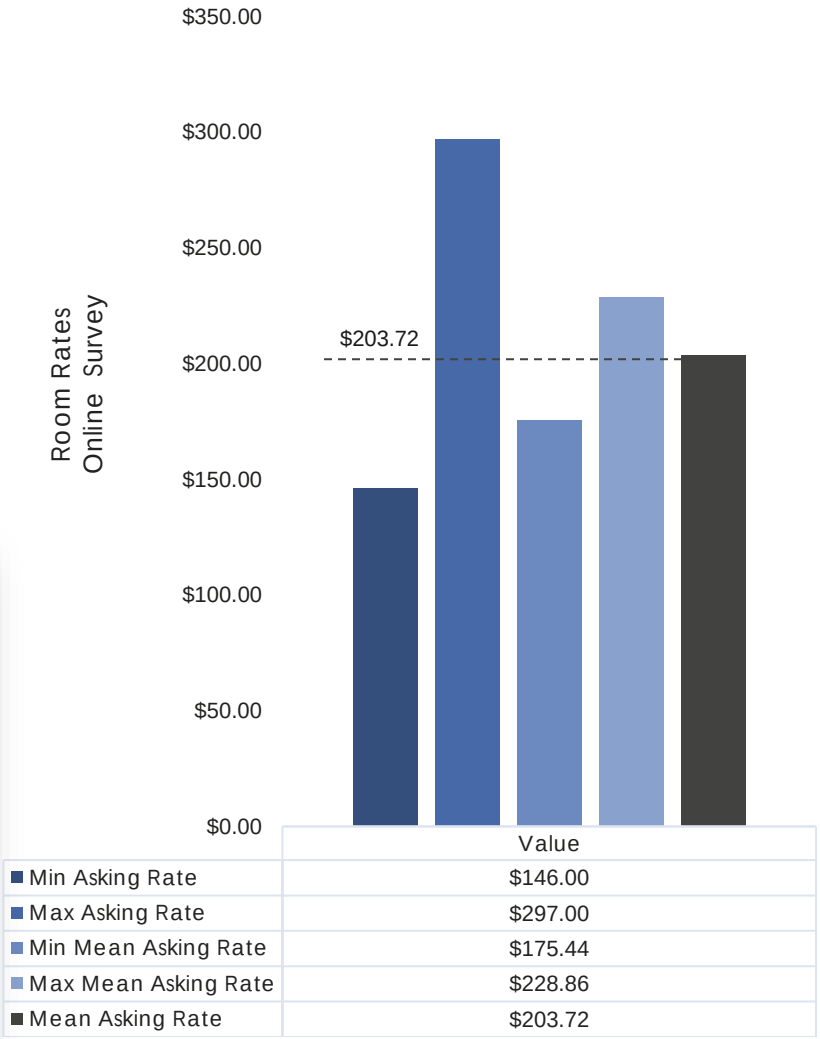
Market Feasibility

Home2 Suites by Hilton Azusa

Site Info	
Location	229 S Azusa Ave , Azusa, CA 91702
Room	110
Built	July 2017
Miles (away) from the Subject Project	15.23
Room Types	• King Studio Suite -Hearing Accessible • King Studio Suite- Non-Smoking • King Studio Suite -Mobility Access/Non-Smoking • One-bedroom King Suite - Non-Smoking • King Suite - Mobility Accessible/Non-Smoking • King Accessible Roll In Shower Suite With Sofa Bed - Non-Smoking • King Suite -Hearing Accessible/Non-Smoking

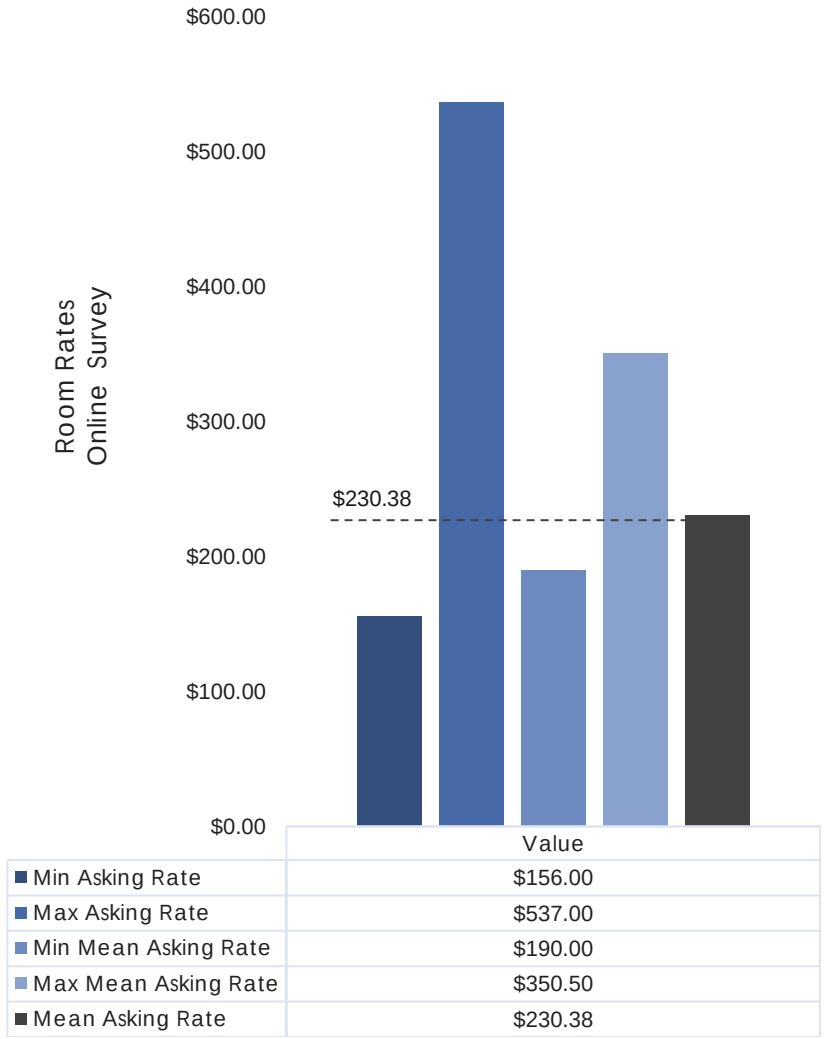


	Value
Min Asking Rate	$146.00
Max Asking Rate	$297.00
Min Mean Asking Rate	$175.44
Max Mean Asking Rate	$228.86
Mean Asking Rate	$203.72

Market Feasibility

Homewood Suites by Hilton Ontario Rancho Cucamonga

Site Info	
Location	11433 Mission Vista Drive, Rancho Cucamonga, CA 91730
Room	103
Built	November 2005
Miles (away) from the Subject Project	5.14
Room Types	• Studio Suite, 1 Queen Bed, Non-smoking • Suite, 2 Queen Beds, Non-Smoking • Suite, 2 Queen Beds, Accessible , Bathtub (Mobility & Hearing) • Suite, 1 King Bed, Non-Smoking • Suite, 1 King Bed, Hearing Accessible • Suite, 1 King Bed, Accessible, Bathtub (Mobility & Hearing) • Suite, 1 King Bed, Accessible (Mobility & Hearing , Roll In Shower) • Premium Suite, 1 King Bed, Accessible, Bathtub • Premium Suite, 1 King Bed, Accessible , Non- Smoking (Hearing) • Room. 2 Bedrooms. Non-Smoking • Suite, Accessible, Non - Smoking • Suite, 2 Queen Beds, Accessible (Roll-in Shower

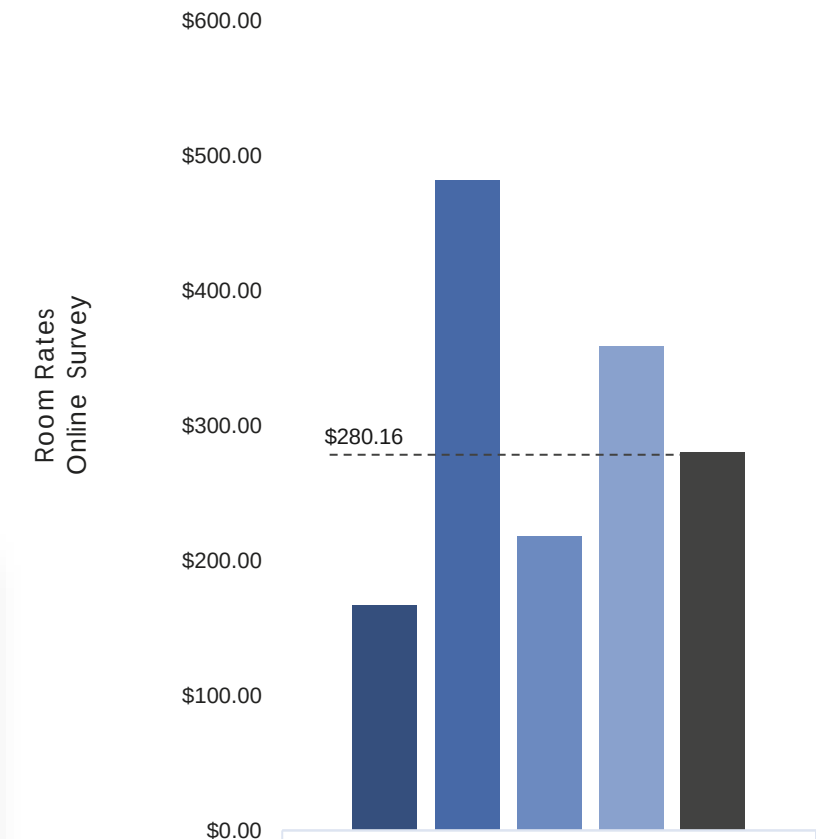


	Value
Min Asking Rate	$156.00
Max Asking Rate	$537.00
Min Mean Asking Rate	$190.00
Max Mean Asking Rate	$350.50
Mean Asking Rate	$230.38

Market Feasibility

TownePlace Suites Ontario Airport

Site Info	
Location	9625 Milliken Avenue, Rancho Cucamonga, CA 91730
Room	112
Built	November 2005
Miles (away) from the Subject Project	5.05
Room Types	• Studio, 1 Queen Bed, Non-Smoking • Studio, 2 Queen Beds, Non-Smoking • Suite, 1 Bedroom, Non-Smoking • Suite 2 Bedrooms, Non-Smoking

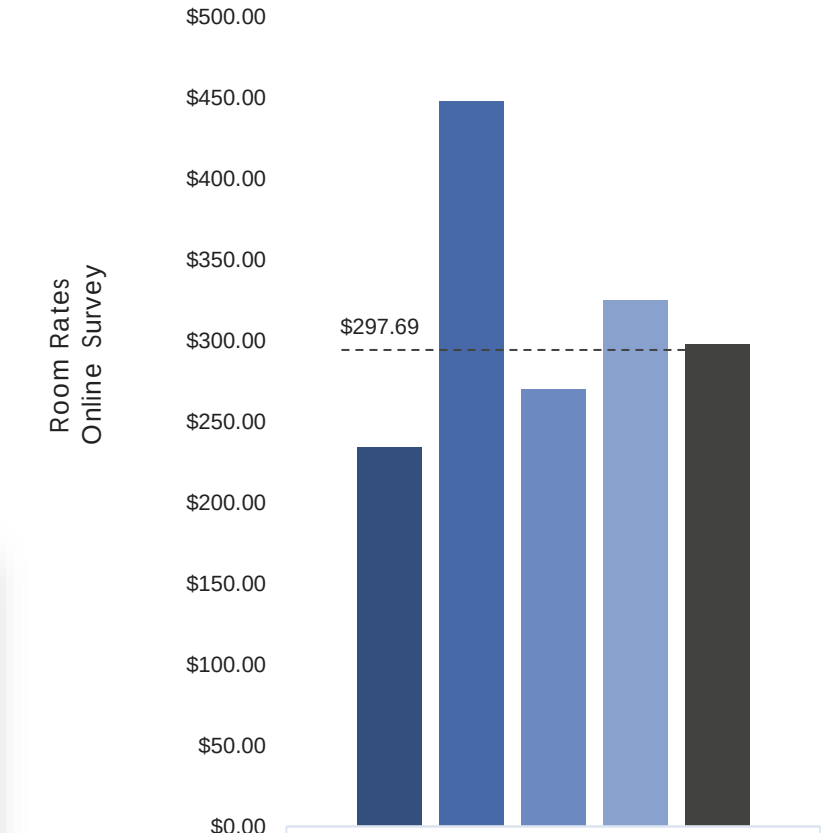


	Value
Min Asking Rate	$167.00
Max Asking Rate	$482.00
Min Mean Asking Rate	$218.09
Max Mean Asking Rate	$359.00
Mean Asking Rate	$280.16

Market Feasibility

Residence Inn Ontario Rancho Cucamonga

Site Info	
Location	9299 Haven Avenue, Rancho Cucamonga, 91730
Room	126
Built	December 2018
Miles (away) from the Subject Project	4.11
Room Types	• Studio, 1 King Bed, Non-Smoking • Studio, 2 Queen Beds, Non-Smoking • Suite, 1 Bedroom, Non-Smoking

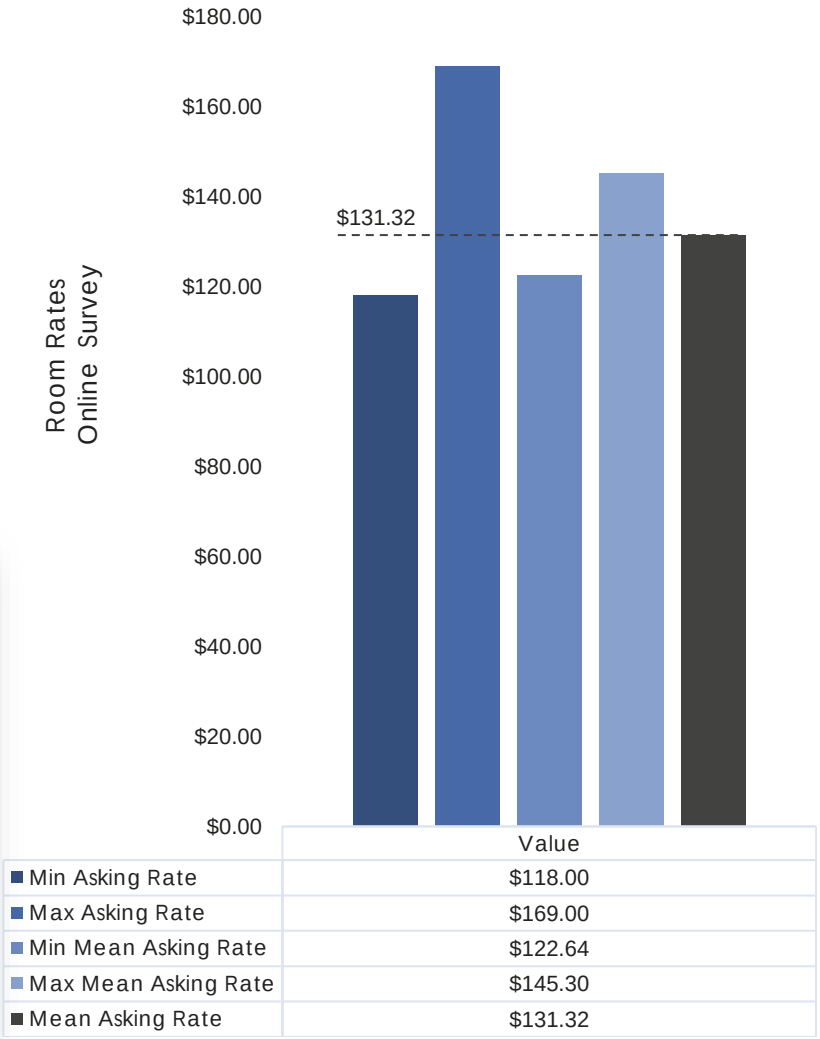


	Value
Min Asking Rate	$234.00
Max Asking Rate	$448.00
Min Mean Asking Rate	$269.91
Max Mean Asking Rate	$324.82
Mean Asking Rate	$297.69

Market Feasibility

Extended Stay America Los Angeles - Ontario Airport

Site Info	
Location	3990 Inland Empire Blvd, Guasti, CA 91764
Room	127
Built	May 1997
Miles (away) from the Subject Project	4.49
Room Types	• Studio, 1 Queen Bed, Non-Smoking • Studio, 1 Queen Bed, Accessible Non-Smoki • Studio, 1 King Bed, Non-Smoking • Studio, 2 Double Beds, Non-Smoking

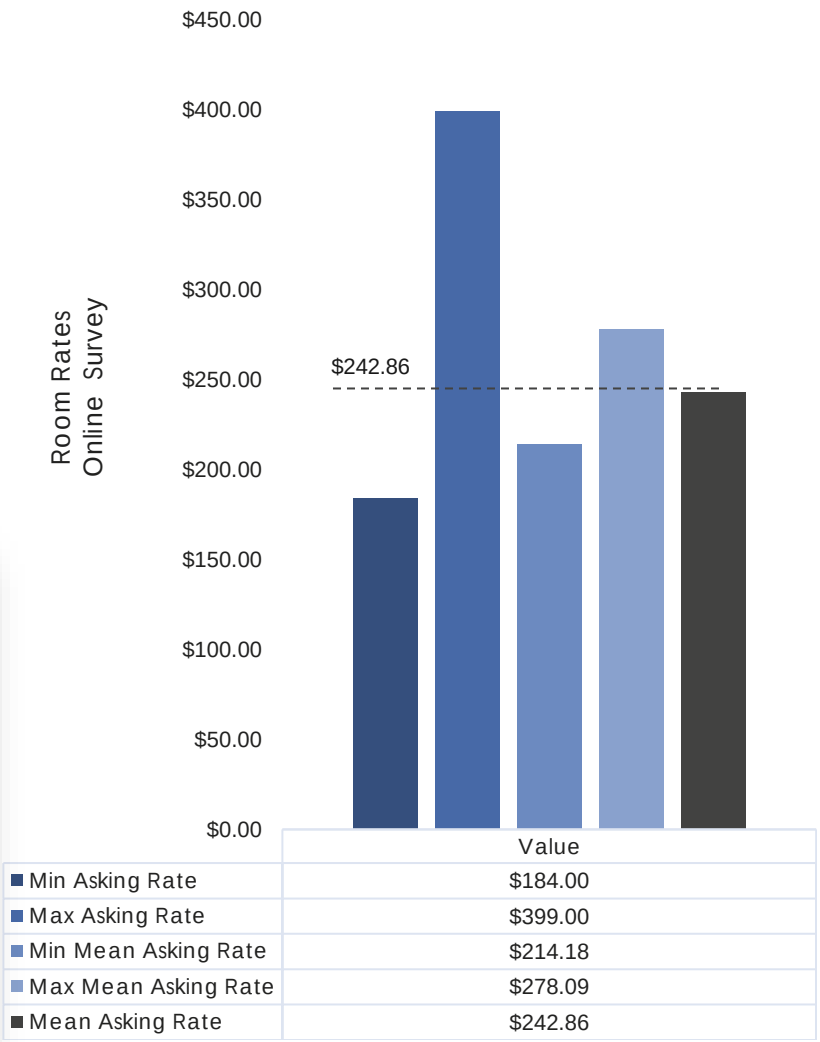


	Value
Min Asking Rate	$118.00
Max Asking Rate	$169.00
Min Mean Asking Rate	$122.64
Max Mean Asking Rate	$145.30
Mean Asking Rate	$131.32

Market Feasibility

Element Ontario

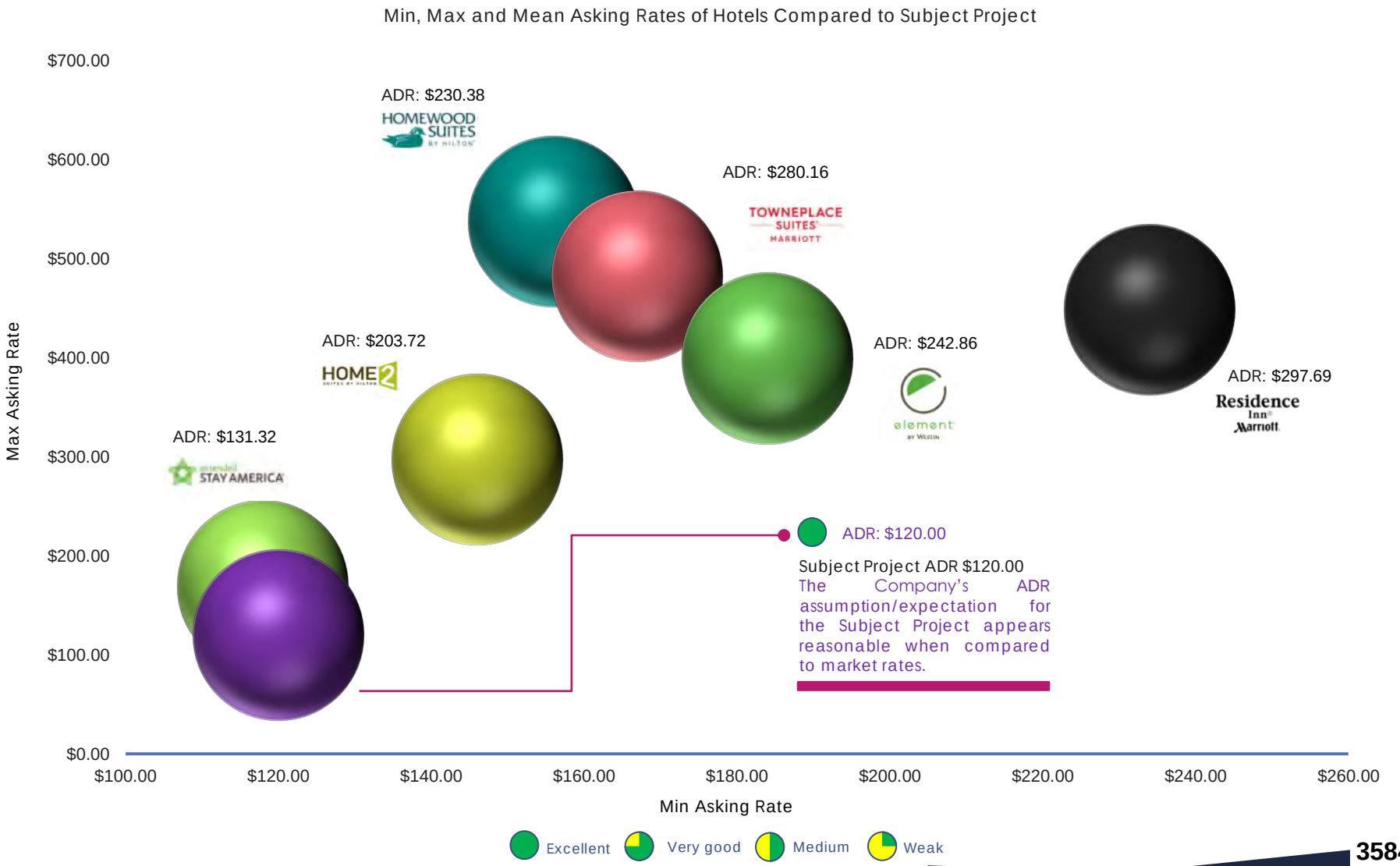
Site Info	
Location	900 Via Piemonte, Ontario, 91764
Room	131
Built	May 2020
Miles (away) from the Subject Project	4.65
Room Types	• Room,1 King Bed, Non-Smoking • Studio,1 King Bed, Non-Smoking • Studio,1 King Bed, Non-Smoking • Suite, 1 Bedroom, Non-Smoking



	Value
Min Asking Rate	$184.00
Max Asking Rate	$399.00
Min Mean Asking Rate	$214.18
Max Mean Asking Rate	$278.09
Mean Asking Rate	$242.86

Market Feasibility

Summary of ADR in the Market



Smith Travel Research Report Analysis

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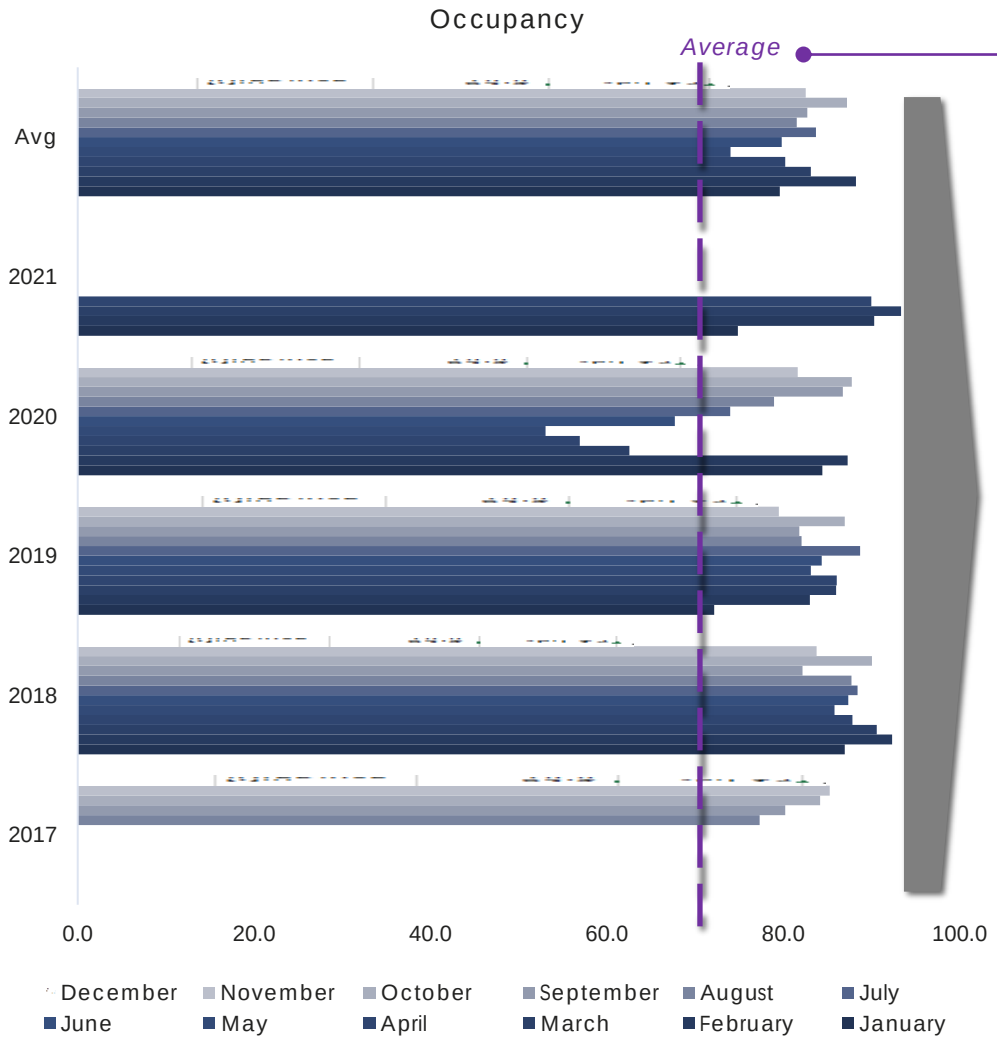
3585

Market Feasibility

Smith Travel Research STR Report – Hotels in the Market Area



53.1 Percent
May 2020

Min Occupancy

93.4 Percent
March 2021

Max Occupancy

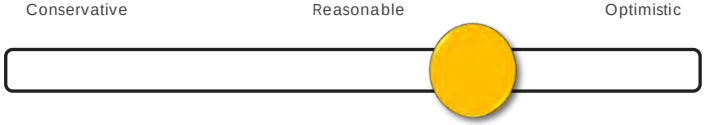
81.5 Percent
Aug 2017 – April 2021

Avg. Occupancy

82.0 – 85.0 Percent
Stabilized

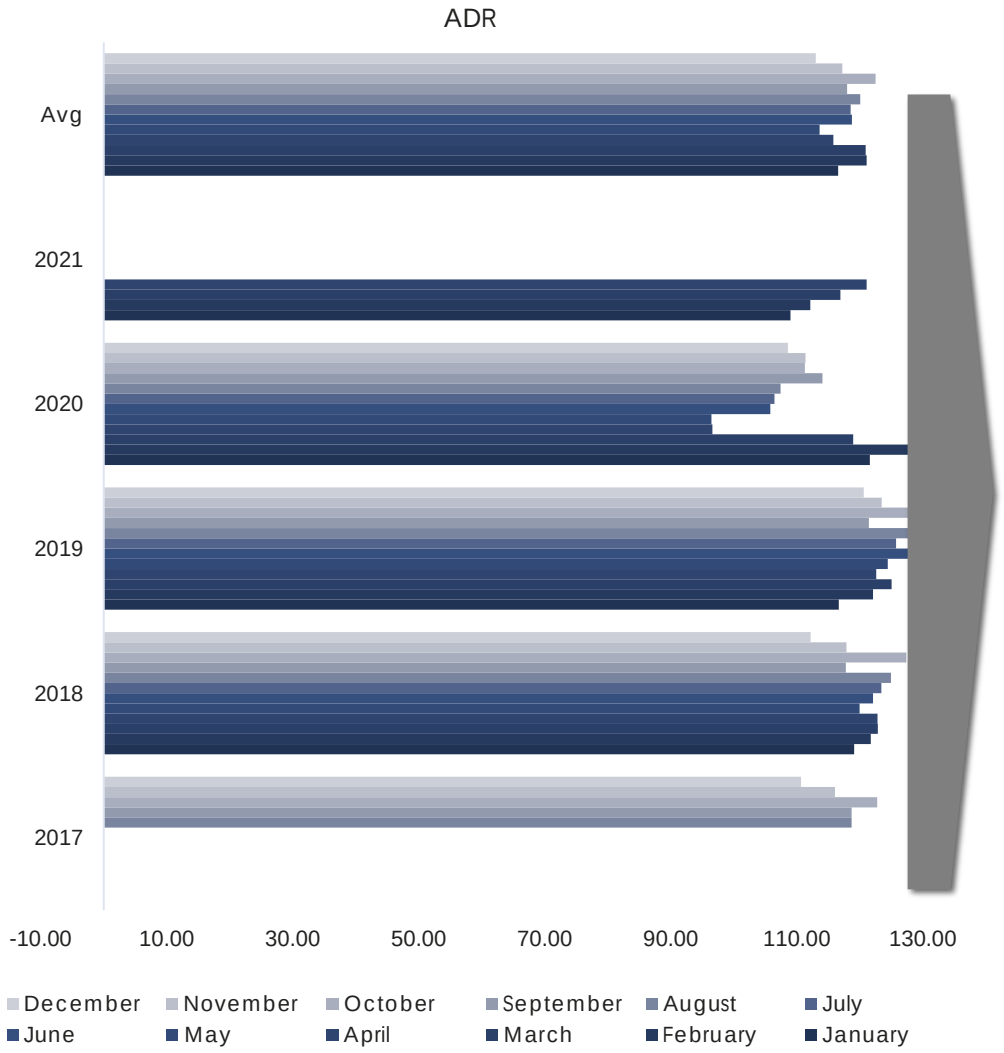
Company Expectations

Company Projections Vs. Market Area



Market Feasibility

Smith Travel Research STR Report – Hotels in the Market Area



$96.44
May 2020

Min ADR

$129.26
August 2019

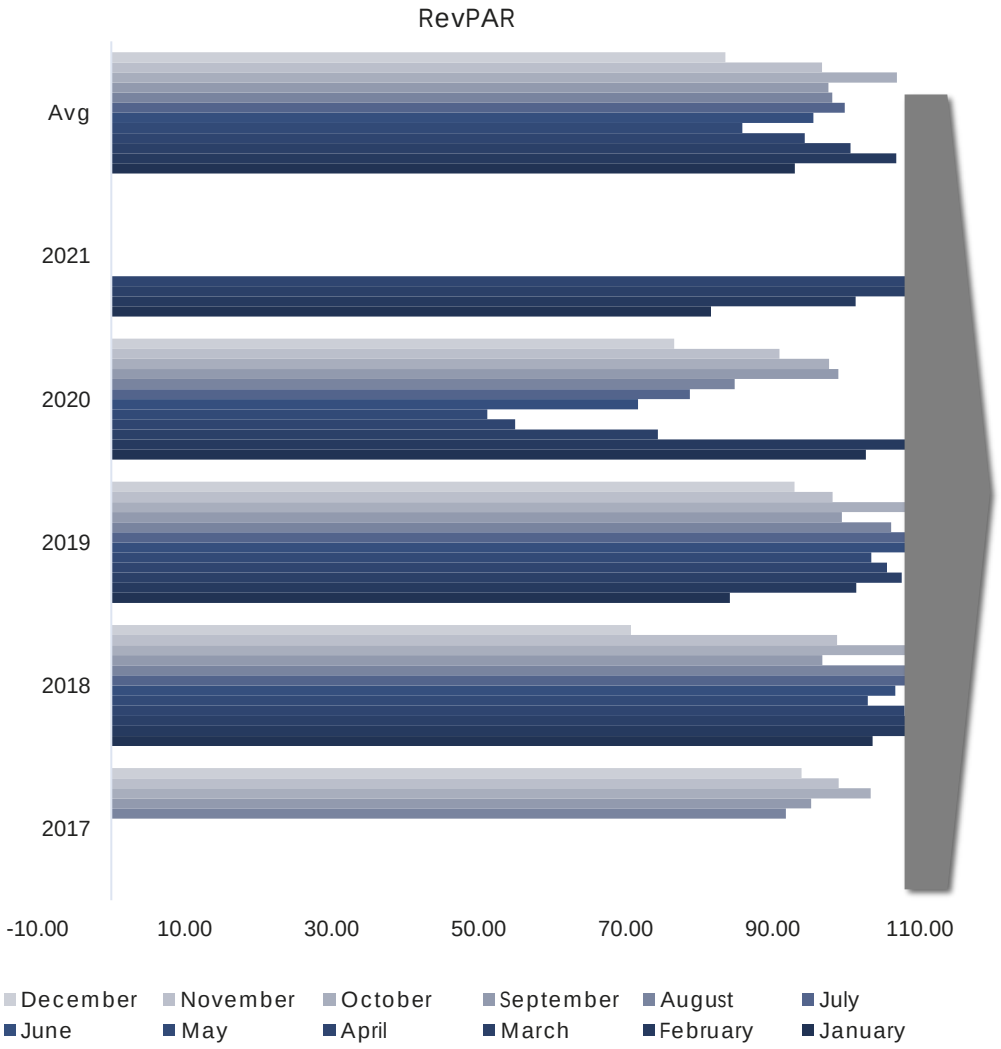
Max ADR

$118.10
Aug 2017 – April 2021

Avg. ADR

Market Feasibility

Smith Travel Research STR Report –Hotels in the Market Area



$51.17
May 2020

Min RevPAR

$114.72
October 2018

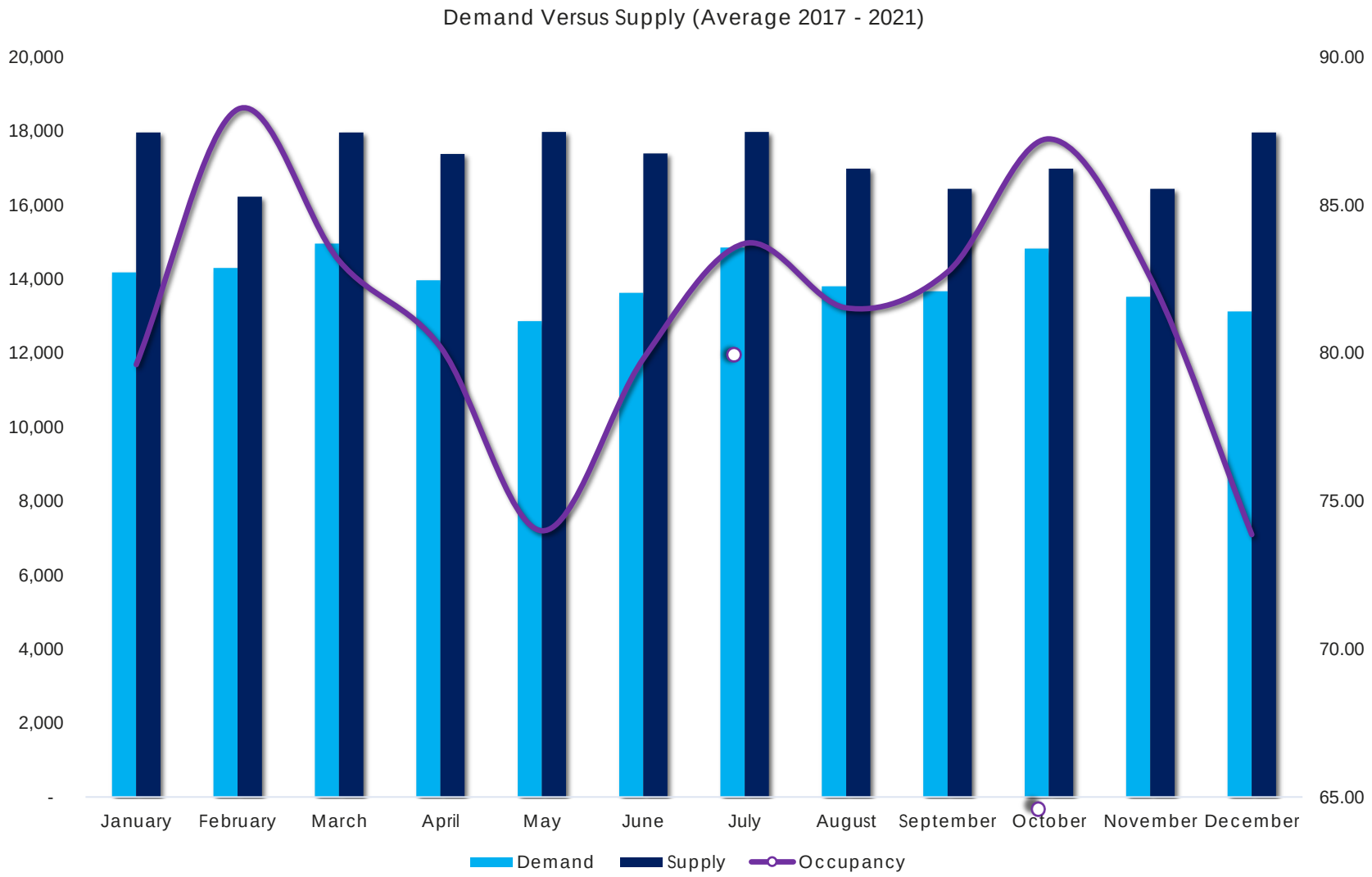
Max RevPAR

$96.76
Aug 2017 – April 2021

Avg. RevPAR

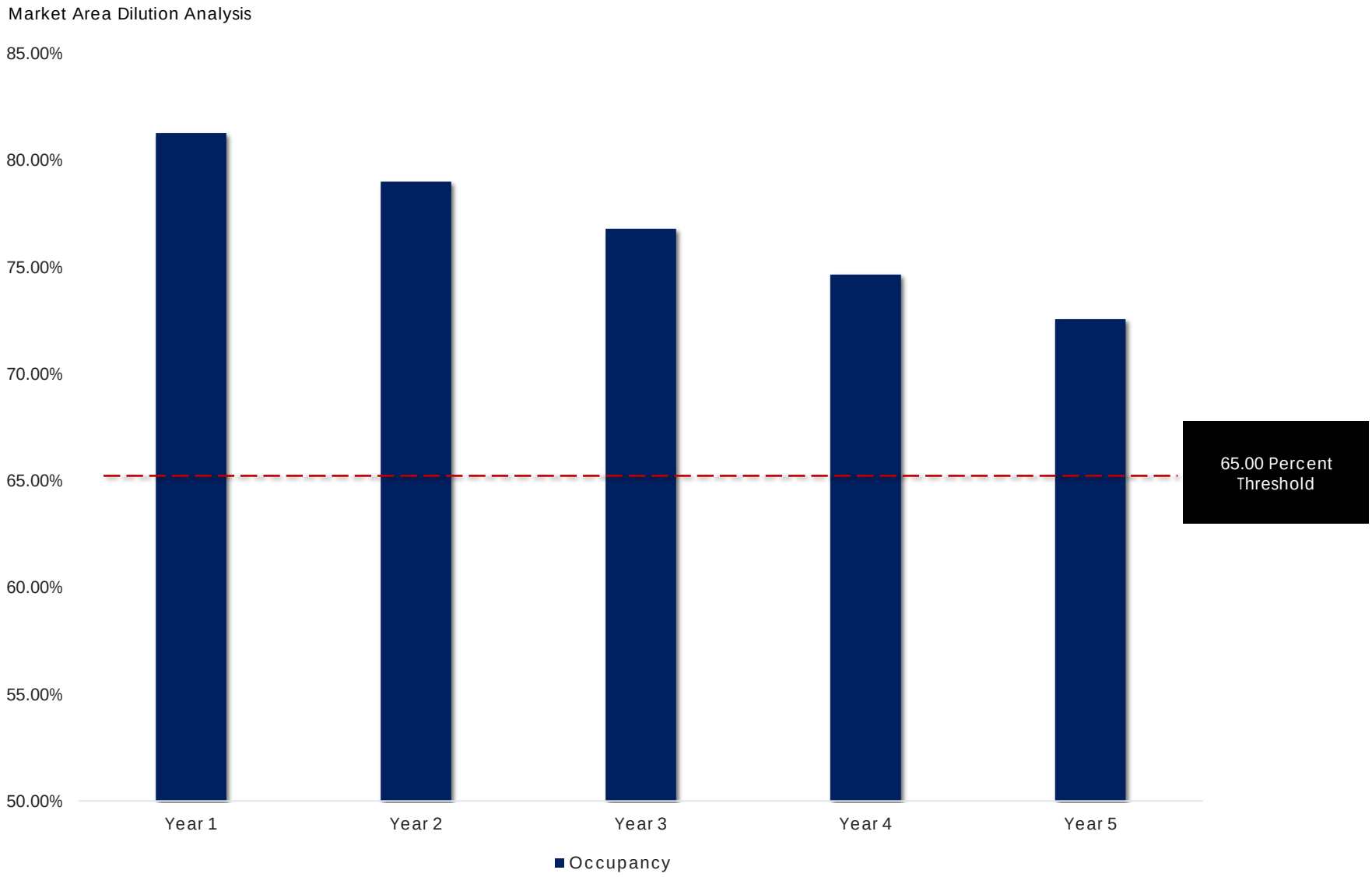
Market Feasibility

Smith Travel Research STR Report – Hotels in the Market Area



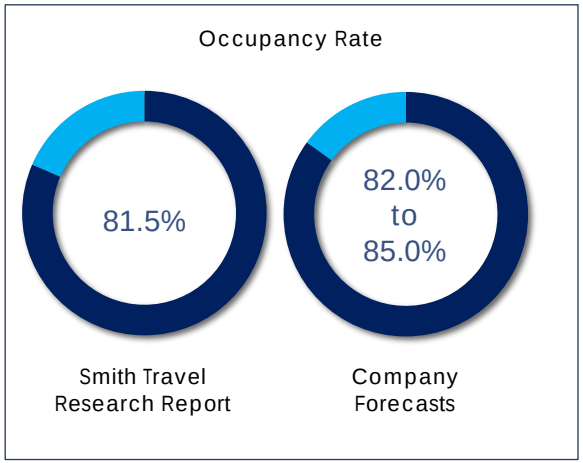
Market Feasibility

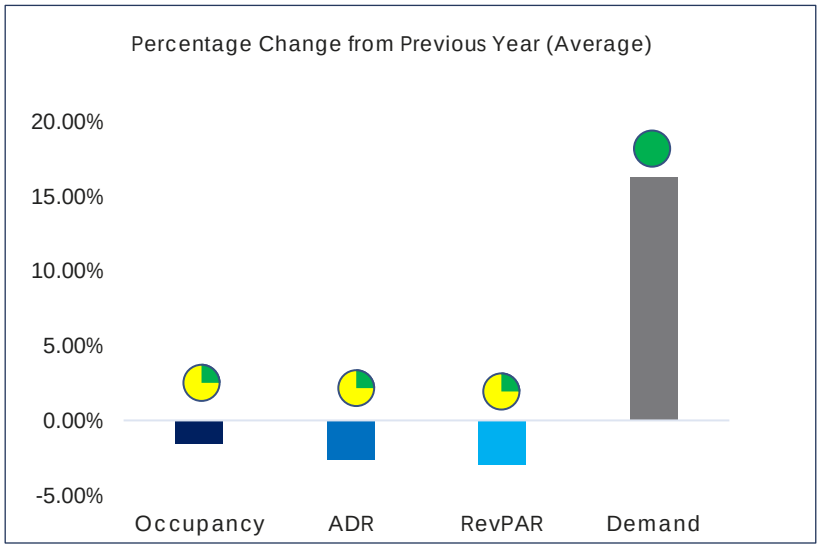
Based on the supply and demand analysis (pre-COVID) within the market area, it appears as though occupancy will likely remain above 65 percent over the next five years.



Market Feasibility

Summary of Occupancy, RevPAR, ADR and Demand in the Market Area

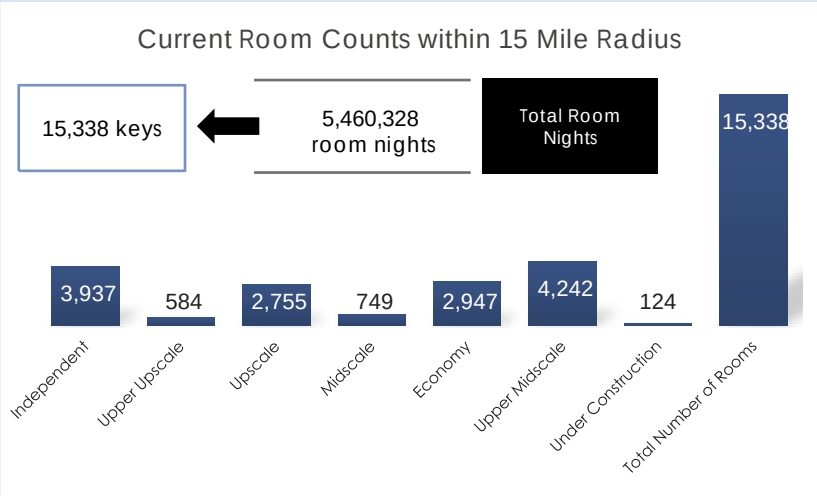




Based on the STR report, the Subject **Project's** rooms are expected to be absorbed in the market area.

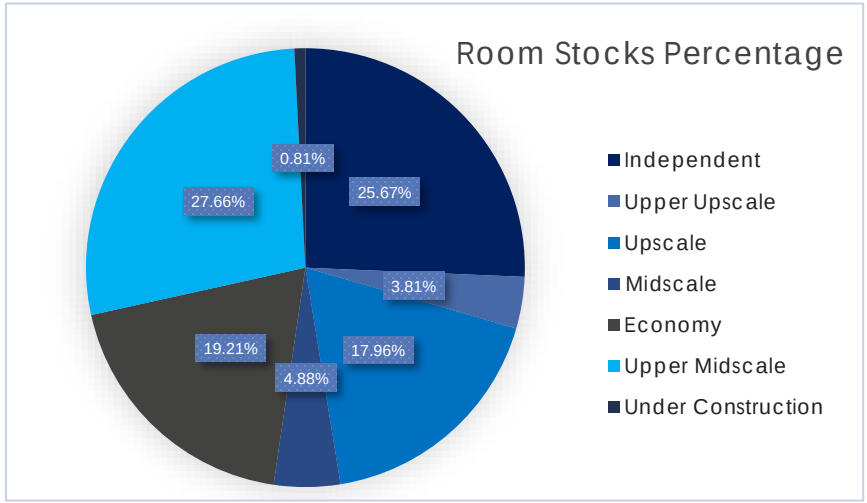
80.4 Percent	Weekend Occupancy
78.4 Percent	Weekday Occupancy
No Risks Identified	All Key Parameters
Approx. 124-Keys Construction Pipeline	New Hospitality Supply Units
Room: 124 Room Nights: 45,260	Subject Project

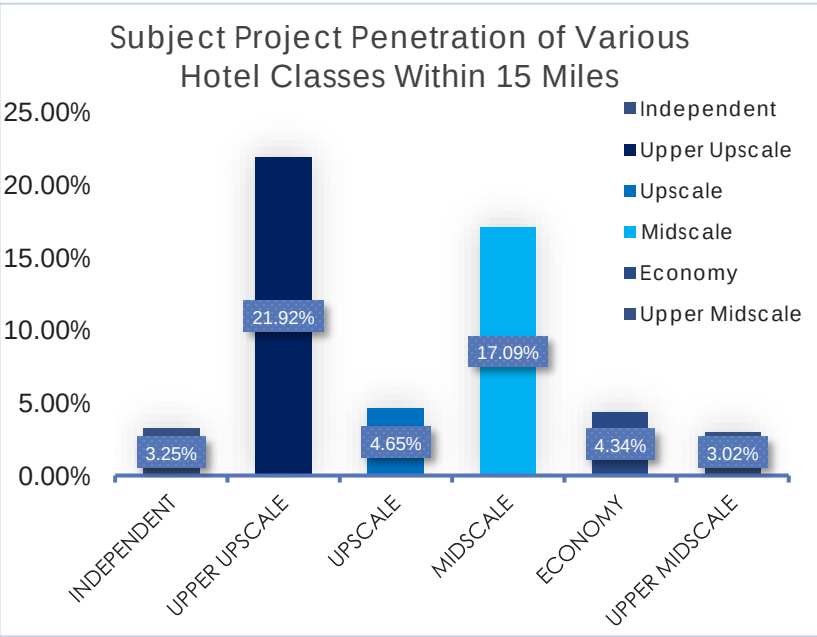
Market Feasibility



0.80 Percent of the total market area

Subject Project Market Share





Subject Project Penetration Rate:

- The graph, derived from data obtained from Smith Travel Research, shows hotel types and room counts in a 15-mile radius from the Subject Project.
- This geographic footprint contains about 15,338 total rooms which accounts for about 5,460,328 total room nights.
- The Subject Project plans call for 128 keys, which is 46,720 room nights, and represents a penetration rate of ~ 0.8 percent of the total market.
- Based on the STR report, it appears as though the Subject Project rooms will be absorbed in the market area as the demand for the market appears to be growing at a CAGR of ~16.30 percent.

Market Feasibility

Discuss adequacy of management (experience, training, and education of management).

Leadership Team

Hero Hotels, LLC	The Company is a fully integrated real estate development company specializing in hotel development with a focus in the California and Texas market areas. The Company also specializes in asset management, hotel property management, and revenue management, with a strong focus on an aggressive sales and marketing strategies, so that their hotels are run at maximum efficiencies. Company principals have owned, operated, and developed real estate assets for the last thirty years and have partnered with well-known franchises such as Holiday Inn Express, Best Western, Days Inn, Ramada, Four Points and Choice.
Dipak Patel| Founder & Principal- Operations	Focus: Hotel Operations Education: UCLA, Bachelors of Science- Bachelors of Science in Economics Other: Owner and Operator of Hotels for 30 plus years in Southern California; liaison to the community relations and experience entrepreneur.
Amar Patel| Founder & Principal- Development	Focus: Acquisitions, real estate development, construction, design & architecture Education: University of Southern California (USC), Bachelors in Business Administration, Real Estate Finance, Masters of Science (USC) for Construction Management Other: USC Construction Alumni Group, Founder; 10 plus years in Project Management with RD Olson Construction.

Market Feasibility

A complete listing of proposed facilities, amenities, and services (i.e.: number and type of rooms, meeting space square footage, recreational amenities, business services such as data ports-workstations-etc., refrigerators in room, laundry service, restaurant-coffee shop-food service, etc.);
See PP55, 56.

History of proposed developer and potential operators (i.e.: years in business, principals, capitalizing, experience, listing of projects, number of units owned, average rates charged, occupancy rates, etc.);
See P73.

Analysis of economic environment projecting likely future economic conditions as they relate to the operation of the subject hotel;
See PP9-17.

Subjects competitive market (i.e.: identification of their market, 3 and 5 year history of occupancy, average daily rate, revenue per available room trends for that market, estimated share of the market the hotel will capture during the first five years of operation, etc.);
See PP57-72.

Analysis of the economic impacts on existing hotel markets within Ontario (i.e.: estimate of the dilution of the market due to addition of proposed hotel, etc.). Note: new hotel projects should only be approved if competitive market occupancy remains at or above 65 percent for a five year projection period;
See PP70-72.

Relationship to demand generators (i.e.: airport, convention center, corporate market, shopping and entertainment);
See PP45-54.

Public cost/revenue projections.
This item does not apply to the Subject Project as planned.

Project Experience (Partial List)

Upscale Hotels in California

Midscale Hotels in California

Midscale Hotels in Arizona

Luxury Hotels in Florida

Luxury Hotels in California

Midscale Hotels in Texas

Upper Midscale Hotels in California

Cannabis Grow House Expansion in Florida

Hydroponic Facility acquisition in Puerto Rico

Hydroponic in Florida

Retail Fruits and Vegetables project in Hurst, Texas

Indoor Sports Complex in Texas

Indoor Sports Complex in North Carolina

Indoor Game Center in New Jersey

Squash Academy in New Jersey

Neighborhood Retail Center in Florida

Biofuel Facility in Hawaii

Hospitals in Louisiana

Mobile Home Parks in Louisiana

Cold Storage Facility in Wisconsin

Cold Storage Facility in New Jersey

Self Storage Facility in Texas

Car Wash in California

Medical Waste to Energy in Rhode Island

Wheat, Corn and Forage Operation

Frac Sand Manufacturing Plant

52 Oil and Gas Wells in Kentucky

Golf Center and Hotel in Colorado

Indoor Gym & Wellness Center in Idaho

Indoor Sports Complex in North Carolina

Nursery and Landscaping in Maryland

Assisted Living and Memory Care in Michigan

Marina Expansion in Kentucky

Apartment Complex in Texas

Football Stadium in Riyadh

Pipe Factory in Sweden

Resume of the Analyst

Awais Dilawer, B.E, MBA eq, FMVA, CMSA, CBCA, IM&A, M&AP, American Appraisal Institute Certified, CFA Investment Foundations Certificate Holder, Completed Level I in 2021 (1st Attempt), CFA Level II (Candidate)

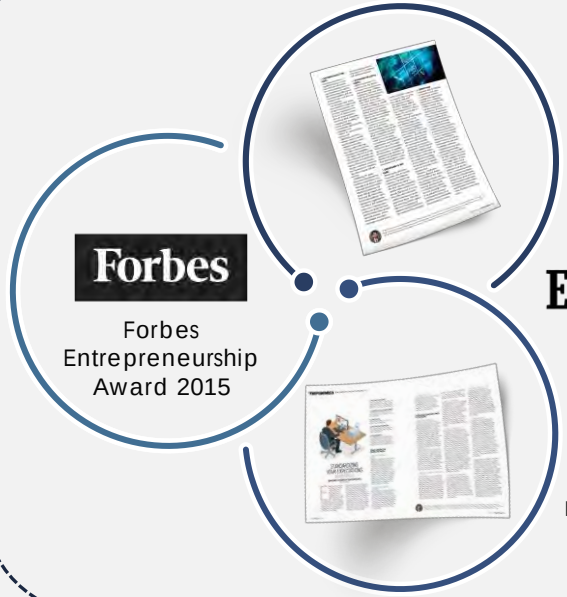
Over fifteen years of experience in investment, venture capital, business management and consulting with a demonstrated record of consistent achievements across different organizations globally. Specialties include feasibility and due diligence of investment opportunities, business strategy and planning, investment strategy development, deal negotiation and structuring.

Education/Courses/Certifications

- Investment Foundations certificate by CFA Institute, ID: 204095
- Financial Modelling and Valuation Analyst, ID: 21257732
- Capital Market and Securities Analyst, ID: 22013916
- Certified Banking and Credit Analyst, ID: 22717302
- Hotel Valuation, American Appraisal Institute, ID: 2637
- Forecasting Revenue, American Appraisal Institute, ID: 2637
- CFA level 1 (Passed), ID: 9445336
- Project Management (University of New South Wales), ID: 3250978
- Business Management (University of New South Wales), ID: 3250978
- Crystal Ball (Oracle), ID: 41909
- University of New South Wales, Australia– Master with Business Management, ID: 3250978
- University of Engineering and Technology, ID: 100312
- International Merger & Acquisition Expert ID: 592
- Merger & Acquisition Professional ID: 593

Certifications

International Publications/Awards



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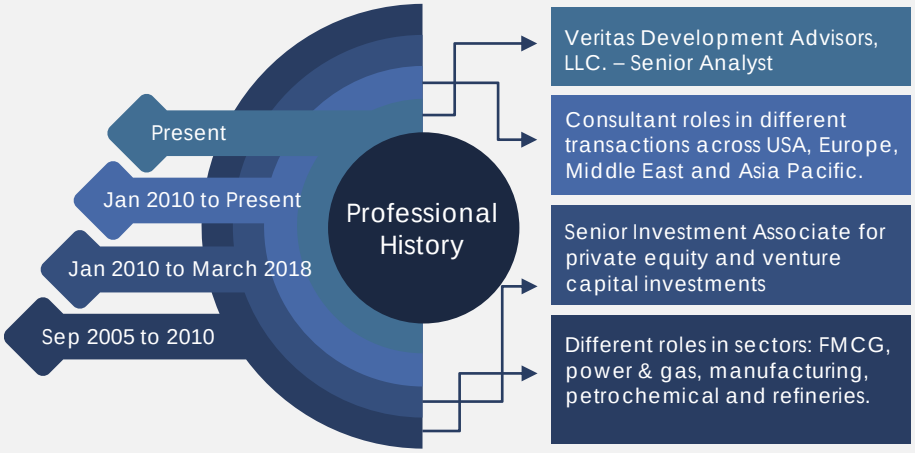
Resume of the Analyst



Key Success

Led *due diligence and feasibility study* of a biotech based in California. The transaction involved arranging financing. The target company listed on Nasdaq with the market cap of more than a billion dollar.

Worked on the *due diligence and feasibility study* on an electric vehicle startup with the transaction valued more than $100 million. The target company is listed in Hong Kong Exchange with the market cap of 400 million dollar.

Successfully conducted *feasibility study and due diligence* of a Dutch based EV charging station company for a private equity fund. The Company is listed on Amsterdam Exchange with the market cap of 170 million dollar..

Key Experience

- Prepared and supervised feasibility study, due diligence and business plan of various complexities across USA, EU and other regions.
- Built and recommended investment committee and board in managing real estate portfolio of million US Dollars in value (commercial malls, hospitals, stadiums, hotels, residential apartments, villas, etc.)
- Experienced in performing in depth transaction financial and commercial diligence using internal and external resources
- Assessed risk and impact analysis for different business opportunities and proposing solutions to deal with potential threatening investment risks.
- Analyzed, reviewed and evaluated reports in the area of ICT, Renewable Energy, Life Sciences Health Care and manufacturing sector in the deals pipeline
- Conducted equity valuations both for transactions and financial reporting purposes
- Developed Investment MEMO's and deal reports for board and potential investors especially for the private equity and venture capital funds.
- Advised clients on financial feasibilities of large projects and conducted market research studies.
- Hands on experience in preparation of legal documents in coordination with internal and external resources.
- Experienced in identifying and sourcing investments in private equity and venture capital funds.
- Managed a team of different resources and contributed to their professional development. Extensive experience of talent management, coaching, development and mentoring.
- Led equity investment projects, help structuring and negotiating transactions from start to close.

Resume of the Analyst

Key Projects throughout his career include:

Manufacturing:

- Battery Manufacturing, WA
- Operational Assessment Steel Plant, ME
- Dairy Farm, GA
- Shrimp Farm, AZ,
- Solar Cells Manufacturing, CA
- Aseptic Packaging Food & Beverage Plant, WV
- Bunker Fuel Oil Processing Plant, TX
- Oil and Gas Drill Fuel Wastewater Plant, OH
- Dairy Biogas Digester, WI, TX, AZ
- Yard Waste Disposal and Composting Facility, FL
- Charcoal Manufacturing, OK
- Aluminum processing facility, TX
- Hydroponics, TX, PR
- Concrete Manufacturing Plant, USVI
- Water Bottling Factory, ME
- Chip Manufacturing, ME
- Biofuel Processing, HI
- Medical Waste, RI
- Oil and Gas Wells, KY
- Frac Sand Facility, OK
- Pipe factory, EU
- Automotive, ME
- Solar Panels Coating, EU

Healthcare & Life science:

- Addiction Center, MD, PA
- Biotech, CA
- Assisted Living & Memory Care, WI, UT, TX, FL, MI, CO
- Therapy and Skilled Day School Facility, FL
- Child Day Care, NV
- Hospitals, LA
- Biosimilars Manufacturing, MA
- Vaccine Manufacturing Plant, WA
- Diabetes Center, ME
- Health Information System, MO

Real Estate:

- Self Storage & RV Storage, NV, PA
- Outdoor Soccer Facility, NM
- Car Wash, CA, NV, TX
- Multicomplex Apartments, TX, LA, CA
- Leadership School, UT
- Equestrian Center, TX
- Cold Storage, FL, WI
- Primrose Schools, MD, VA
- Historic Park, IL, KY
- Indoor Sports Complex, NC, NM, TX, ID
- Gas Station with Convenience Store, UT, CA
- Nursey and Landscaping, MD
- RV Park, FL
- Indoor Shooting Range, VA
- Golf Sports Complex, CO
- Distribution & Shipping Facility, TX
- Marina, KY
- Mobile Home Park, LA
- Neighborhood Shopping Center, FL
- Squash Academy, NJ
- Private School, WA, EU
- Stadium, ME

Restaurant:

- Culver, AZ
- Independent Restaurants, UT, NM
- Buffalo Wings, KY
- Dairy Queen, GA
- Cinnabon, ME
- McDonald, ME
- Subway, ME

Hotels & Resorts:

- Baymont Inn & Suites, AZ
- Hilton Hotel, PA, CA, AZ
- Best Western, CA,
- Best Western Plus, TX
- Fairfield Inn& Suites, CA
- Mainstay Suites, TN
- Holiday Inn, TX
- Motel 6, CA
- Independent Hotels, CA, FL, UT
- Resort, NY
- Dual Branded Hotel, AL
- Banquet Hall, CA
- Event Center, TX
- Comfort Suites, CA
- Hampton Inn & Suites, CA
- Marriot, CA

Contact Us

Veritas Development Advisors, LLC ("VDA")

Steve Alves, Managing Partner

Email: salves@veritasda.com

Ph: 240-626-1209

Exhibit L—PARKING STUDY

(Document follows this page)

TRAMES SOLUTIONS INC.
4225 Oceanside Blvd., #354H
Oceanside, CA 92056
(760) 291 - 1400

October 21, 2021

Roger Barbosa
Milestone Management
9891 Irvine Center Dr., Suite #200
Irvine, CA 92618

Subject: Extended Stay Hotel Parking Study (JN 0365-0001)

Dear Mr. Barbosa:

Trames Solutions Inc. is pleased to submit the following parking evaluation for the proposed Extended Stay Hotel development. It is our understanding that the site is proposed to be developed with a 128 room hotel. The project site is located at 5060 E. Fourth St. in the City of Ontario.

INTRODUCTION

The proposed project consists of a 128-room hotel with an 1,824 sf meeting room, and a 331 sf cafe. Attachment A contains the site plan that shows a total of 118 parking spaces consisting of 106 regular spaces, 5 handicap spaces, and 7 electric vehicle spaces.

The intent of this parking evaluation is to determine the parking requirements of the proposed uses based on the City's parking code and the potential requirements of the project due to the nature of the proposed land uses.

CITY OF ONTARIO PARKING CODE REQUIREMENTS

Proposed Project

The following parking rate is based on the City of Ontario for the use associated with the proposed site:

- Hotel = 1 space per room

Therefore, according to the City's requirements, the following number of parking spaces would be required for the proposed project:

Hotel: 128 rooms x (1 space per room) = 128 spaces

PARKING REDUCTION MEASURES

The proposed project will consist of several factors that can reduce the number of parking spaces required for the site. These "mode and noncaptive adjustment" factors include the location of the project (urban environment), provision/proximity to public transit opportunities, and ride hailing opportunities.

The typical patron of the proposed hotel use is anticipated to arrive from the Ontario International Airport (about 5 miles away) to attend a conference or meeting in the adjacent area or attend an event at the Ontario Convention Center. Rather than renting a car, it is anticipated that the patrons will arrive at the hotel via a ride hailing service since the cost and convenience of such services outweigh the difficulty and expense of renting a vehicle.

Ride Hailing Services

Uber/Lyft provide on-demand transportation services for a reasonable cost. Once at the hotel, guests can use the Uber/Lyft services to travel to their nearby meetings/conferences rather than renting a vehicle.

Public Transit

Public bus service is provided by Omnitrans Route 61 and can be taken to the Ontario Airport or other various amenities.

Urban Location

The urban environment promotes pedestrian mobility in lieu of vehicles. Many of the restaurants/attractions are within walking distance of the hotel. Sidewalks and signalized intersections provide controlled crossings.

Urban Land Institute (ULI) Recommended Reduction Measures

The Urban Land Institute has provided mode and noncaptive parking reduction percentages for a hotel based on the factors listed above. ULI has indicated a 41% reduction factor during the weekday and a 31% reduction factor during the weekend in visitor parking for a hotel located in the vicinity of a suburban location (**Shared Parking**, 3rd Edition, Urban Land Institute, 2020, Figure 4-18 Suggested Mode and Noncaptive Adjustment Factors for Hotels). Since the hotel will contain an 1,824 sf meeting room and a 331 sf cafe, these uses were also accounted for in the parking calculations. Furthermore, parking demands at hotels peak at different times of day/different months of the year. ULI's publication Shared Parking, 3rd edition (2020) provides the peaking factors by time of day and month. For the analysis provided in this report, the highest peaks (worst case conditions) were used.

The peak parking demands can be determined by applying the factors and peak demands by time of day/month for the proposed hotel use as shown below. Based on the application of these factors, the hotel will have a peak demand of 94 spaces at 8 AM on a weekday and 105 spaces at 8 AM on a weekend. Attachment B contains the summary of the project's peak parking demands based on the ULI factors.

Weekday at 8 AM

Suburban Hotel:

Rooms (128 rooms x 1 space/room)	= 128 spaces
Adjustment due to ride hailing/public transit/suburban location (41% reduction)	= -52 spaces
Peak hour adjustment (10% reduction)	= -8 spaces
Subtotal	= 68 spaces
Employees (128 rooms x .15 space/room)	= 19 spaces
Subtotal	= 19 spaces
Meeting Room (1,824 sf x 8.72 space/tsf)	= 16 spaces
Peak hour adjustment (70% reduction)	= -11 spaces
Employees (2,155 sf x 1.39 space/tsf)	= 3 spaces
Peak hour adjustment (40% reduction)	= -1 space
Subtotal	= 7 spaces
Total	**= 94 spaces**

Weekend at 8 AM

Suburban Hotel:

Rooms (128 rooms x 1 space/room)	= 128 spaces
Adjustment due to ride hailing/public transit/suburban location (31% reduction)	= -40 spaces
Peak hour adjustment (10% reduction)	= -9 spaces
Subtotal	= 79 spaces
Employees (128 rooms x .15 space/room)	= 19 spaces
Subtotal	= 19 spaces
Meeting Room (1,824 sf x 6.78 space/tsf)	= 12 spaces
Peak hour adjustment (70% reduction)	= -8 spaces
Employees (2,155 sf x 1.41 space/tsf)	= 3 spaces
Peak hour adjustment (40% reduction)	= -1 space
Subtotal	= 6 spaces
Total	**= 104 spaces**

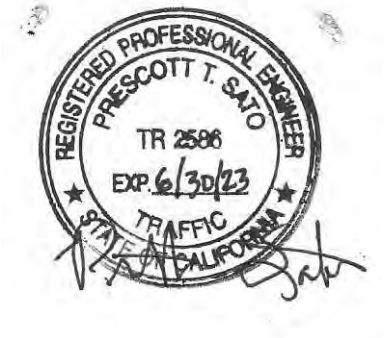
CONCLUSIONS

Based on the City's requirements, a total of 128 parking spaces would be required for the proposed 128 room hotel project. The City's parking code does not differentiate between the various hotel types nor where they are located. For example, a resort/family hotel may require more parking spaces than a suburban hotel located near a hotel since renting a passenger vehicle may be more economical/convenient for a family on vacation than using a ride hailing service.

As indicated in this study, a reduction in the number of parking spaces for a suburban hotel has been determined due to the close proximity to the Ontario Airport, the economic advantage and convenience of ride hailing services, and the availability of public transit services. The analysis indicates that a total of 94 parking spaces on a weekday and 104 parking spaces on a weekend would be the peak parking demands of the proposed hotel due to the factors described above. Since the project is proposed to provide 118 spaces for the hotel, a surplus of 14 parking spaces would be provided for the hotel during the peak demand timeframe.

If there are any questions regarding this evaluation, please do not hesitate to call me at (949) 244-2436.

Respectfully submitted,
Trames Solutions Inc.



Scott Sato, P.E.
Vice President

Attachment A – Site Plan
Attachment B - Shared Parking Summary

ATTACHMENT A

SITE PLAN

NEW 4-STORY BRANDED EXTENDED STAY / RESIDENCE INN HOTEL DEVELOPMENT (128 ROOMS)

5060 E. FOURTH ST., ONTARIO, CA 91764

Project Directory

DEVELOPER:
ROGER BARBOSA (PRINCIPAL)
MILESTONE MANAGEMENT
9891 IRVINE CENTER DR., SUITE #200
IRVINE, CA 92618
TEL.: (714) 321-8557

ARCHITECT & CIVIL ENGINEER:
W&W LAND DESIGN CONSULTANTS INC.
WINSTON LIU P.E., TOM LAU, AIA
2335 W. FOOTHILL BLVD., SUITE I
UPLAND, CA 91786
TEL.: (909) 608-7118
FAX.: (909) 946-1137

LANDSCAPE ARCHITECT:
PHILMAY LANDSCAPE ARCHITECT
PHILMAY
1937 W. 9TH ST.,
UPLAND, CA 91786
TEL.: (909) 373-1959
FAX.: (909) 373-1958

Abbreviations

&	AND	F.F.	FLOOR FINISH	PL.	PLATE
∠	ANGLE	FDN.	FOUNDATION	P.LAM.	PLASTIC LAMINATE
@	AT	FIN.	FINISH	PLAS.	PLASTER
℄	CENTERLINE	FL.	FLOOR	PLYWD.	PLYWOOD
⌀	DIAMETER OF ROUND	FLASH'G	FLASHING	PR.	PAIR
#	POUND OR NUMBER	FLUOR.	FLUORESCENT	PT.	POINT
(E)	EXISTING	F.O.C.	FACE OF CONCRETE	PTN.	PARTITION
(R)	RELOCATED	F.O.F.	FACE OF FINISH		
(N)	NEW	F.O.S.	FACE OF STUDS	Q.T.	QUARRY TILE
		FPRF.	FIREPROOF	QSR	QUICK SERVE RESTAURANT
A.F.F.	ABOVE FINISH FLOOR	F.S.	FLOOR SINK		
A.D.	AREA DRAIN	FT.	FOOT OR FEET	R/RAD.	RADIUS
ADJ.	ADJUSTABLE	FTG.	FOOTING	R.D.	ROOF DRAIN
AGGR.	AGGREGATE	FURR.	FURRING	REF.	REFERENCE
AL.	ALUMINUM	FUT.	FUTURE	REFR.	REFRIGERATOR
APPROX.	APPROXIMATE			RGTR.	REGISTER
ARCH.	ARCHITECTURAL	G.A.	GAUGE	REINF.	REINFORCED
ASB.	ASBESTOS	GALV.	GALVANIZED	REQ'D	REQUIRED
ASPH.	ASPHALT	GL.	GLASS	RESIL.	RESILIENT
		GR.	GRADE	RM.	ROOM
		GSM	GALVANIZED SHEET METAL	R.O.	ROUGH OPENING
BD.	BOARD	GYP.	GYPSUM	RWD.	REDWOOD
BITUM.	BITUMINOUS	GYP. BD.	GYPSUM BOARD	R.W.L.	RAIN WATER LEADER
BLDG.	BUILDING				
BLKG.	BLOCKING	H.B.	HOSE BIBB		
BM.	BEAM	H.C.	HOLLOW CORE		
BOT.	BOTTOM	HCP	HANDICAP	S.C	SOLID CORE
		HDWD.	HARDWOOD	SCHED.	SCHEDULE
CAB.	CABINET	HDWE.	HARDWARE	S.D.	SOAP DISPENSER
CEM.	CEMENT	H.M.	HOLLOW METAL	SECT.	SECTION
CER.	CERAMIC	HORIZ.	HORIZONTAL	SH.	SHELF
C.I.	CAST IRON	HR.	HOUR	SHR.	SHOWER
CLG.	CEILING	HGT.	HEIGHT	SHT.	SHEET
CLKG.	CAULKING			SIM.	SIMILAR
CLO.	CLOSET	I.D.	INSIDE DIAMETER	SL.	SLOPE
CLR.	CLEAR	INSUL.	INSULATION	SPEC.	SPECIFICATION
C.O.	CASED OPENING	INT.	INTERIOR	SQ.	SQUARE
COL.	COLUMN			S.ST.	STAINLESS STEEL
CONC.	CONCRETE	JT.	JOINT	STD.	STANDARD
CONN.	CONNECTION			STL.	STEEL
CONSTR.	CONSTRUCTION	KIT.	KITCHEN	STOR.	STORAGE
CONT.	CONTINUOUS			STRL.	STRUCTURAL
CTSK.	COUNTERSUNK	LAMINATE	LAM.	SYM.	SYMMETRICAL
CNTR.	COUNTER	LAV.	LAVATORY		
CTR.	CENTER	LT.	LIGHT	T.B.S.	TO BE SPECIFIED
				TRD.	TREAD
DBL.	DOUBLE	MAX.	MAXIMUM	T.B.	TOWEL BAR
DEPT.	DEPARTMENT	M.C.	MEDICINE CABINET	T.C.	TOP OF CURB
DET.	DETAIL	MECH.	MECHANICAL	TEL.	TELEPHONE
DIA.	DIAMETER	MEMB.	MEMBRANE	TER.	TERRAZZO
DIM.	DIMENSION	MET.	METAL	T.& G.	TONGUE & GROOVE
DISP.	DISPENSER	MFR.	MANUFACTURER	THK.	THICK
DN.	DOWN	MIN.	MINIMUM	T.P.	TOP OF PAVEMENT
D.O.	DOOR OPENING	MIR.	MIRROR	T.P.D.	TOILET PAPER DISPENSER
DR.	DOOR	MISC.	MISCELLANEOUS	T.V.	TELEVISION
DWR.	DRAWER	M.O.	MASONRY OPENING	T.W.	TOP OF WALL
D.S.	DOWNSPOUT	MTD.	MOUNTED	TYP.	TYPICAL
DWG.	DRAWING	MUL.	MULLION		
				UNF.	UNFINISHED
E.	EXISTING	N.	NEW	U.O.N.	UNLESS OTHERWISE NOTED
EA.	EACH	N.I.C.	NOT IN CONTRACT		
E.J.	EXPANSION JOINT	NO./#	NUMBER	VERT	VERTICAL
EL.	ELEVATION	NOM.	NOMINAL		
ELEC.	ELECTRICAL	N.T.S.	NOT TO SCALE	W.	WEST
E.P.	ELECTRICAL PANELBOARD	O.A.	OVERALL	W/	WITH
EQ.	EQUAL	OBS.	OBSCURE	W.C.	WATER CLOSET
EQPT.	EQUIPMENT	O.C.	ON CENTER	WD.	WOOD
EXST.	EXISTING	O.D.	OUTSIDE DIAMETER	W/O	WITHOUT
EXP.	EXPANSION	OFF.	OFFICE	WP.	WATERPROOF
EXT.	EXTERIOR	OPNG.	OPENING	WSCT.	WAINSCOT
		OPP.	OPPOSITE	WT.	WEIGHT

Sheet Index

T	PROJECT DATA, EXISTING SITE/SURVEY, VICINITY MAP
A1.01	PROPOSED SITE PLAN
A1.02	CONDITIONS OF APPROVAL
A1.03	FIRE ACCESS PLAN, TRASH/RECYCLE ENCLOSURE
A1.04	ENLARGED PAVING PLAN
A2.01	PROPOSED FIRST FLOOR PLAN
A2.02	PROPOSED SECOND FLOOR PLAN
A2.03	PROPOSED THIRD FLOOR PLAN
A2.04	PROPOSED FOURTH FLOOR PLAN
A2.05	PROPOSED ROOF PLAN
A3.01	PROPOSED BLD'G ELEVATION (NORTH)
A3.02	PROPOSED BLD'G ELEVATIONS (WEST & SOUTH)
A3.03	PROPOSED BLD'G ELEVATION (EAST)
A4.01	BUILDING SECTIONS & LINE OF SIGHT STUDIES
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L-1	COVER SHEET
L-2	PRELIMINARY LANDSCAPE PLAN
C-1	SITE UTILIZATION MAP
C-2	CONCEPTUAL GRADING/DRAINAGE PLAN
C-3	PROPOSED WQMP EXHIBIT
C-4	UTILITIES SYSTEMS MAP
C-5	SOLID WASTE HANDLING PLAN

Legal Description

LOT PARCEL 5 OF PARCEL MAP 15953. IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 202 PAGE 44-47 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

Planning Dept. Notes

1) SITE PLAN SHALL MEET ALL ENGINEERING & NPDES REQUIREMENTS.
2) SIGNAGE UNDER SEPARATE SUBMITTAL.
3) FIRE SPRINKLER (NFPA 13) & ALARM (NFPA 72) UNDER SEPARATE PERMIT.

Project Data

ADDRESS:	5060 E FOURTH ST., ONTARIO, CA 91764
APN#:	0238-012-30-0000
GENERAL PLAN USE:	GENERAL COMMERCIAL (0.4 FAR)
ZONING (SP):	FC FREEWAY COMMERCIAL (THE EXCHANGE) PSP02-002
PROPOSED OCCUPANCY:	R-1 (HOTEL > 10 PERSON) 50,364 S.F. B (BUSINESS) 4,886 S.F.
(E) SITE AREA (GROSS):	80,000 S.F. (1.837 ACRE)
SITE AREA (NET):	80,000 S.F. (1.837 ACRE)
PROPOSED BUILDING:	55,250 S.F. (4-STORY)
TYPE OF CONSTRUCTION:	VA (1/F TO 4/F)
SPRINKLER:	FULLY SPRINKLERED (NFPA 13) (UNDER SEPARATE PERMIT)
FIRE ALARM:	YES, (NFPA 72) (UNDER SEPARATE PERMIT)
BUILDING HEIGHT:	40'-0" (MAIN ROOF), +53'-0" (TOWER)
PARKING AREA:	19,106 S.F.
PARKING LANDSCAPE:	12,000 S.F. (15.00%)
SHARED DRIVEWAY:	5,516± S.F. (0.127± ACRE)

A) SETBACK REQUIREMENTS:

	PARKING SETBACK REQUIRED	PARKING SETBACK PROVIDED	BUILDING SETBACK REQUIRED	BUILDING SETBACK PROVIDED
I-15 FWY	= 5'(MIN.) =15'(AVE.)	= 5' = 15.04' (SEE CAL. ON A1.01)	= 20'	= >20'
FOURTH ST.	= 25'	= >25'	= 30'	= >30'

B) PARKING COMPUTATION

	REQUIRED	(PROVIDED)
128 ROOMS	129 STALLS	118 STALLS (91.5%)
	TOTAL	118 STALLS (INCL. 5 HCP & 7 EV)

C) FLOOR AREA RATIO (0.5 MAX.) = 0.5
55,250 S.F./80,000 S.F. = 0.691
LOT COVERAGE
13,250 S.F./80,000 S.F. = 16.56%
LANDSCAPE AREA = 14,190 S.F. (INCL. POOL)
14,190 S.F./80,000 S.F. = 17.74%

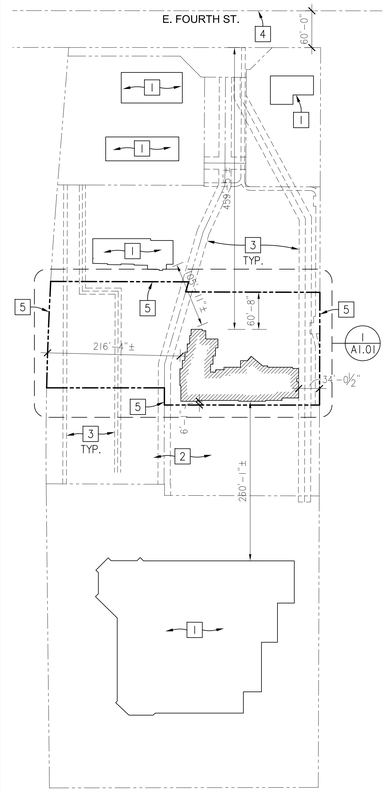
D) GUESTROOM AREA BREAKDOWN:

RM. TYPE	QUEEN SUITE	D.Q. SUITE	ADA QQ QUEEN	ADA QUEEN
4/F 14,000 S.F. (36)	18	16	1	1
3/F 14,000 S.F. (36)	18	16	1	1
2/F 14,000 S.F. (36)	18	16	1	1
1/F 13,250 S.F. (20)	7	13		
55,250 S.F.(128)	61	61	3	3
SUB-TOTAL 128 ROOMS				

E) AMENITY AREA BREAKDOWN SUMMARY

MEETING ROOM (1/F) 1,194+630 =	1,824 S.F.
SEATING AREA (2/F, 3/F & 4/F)	300 S.F.
CAFE/SNACK (1/F)	331 S.F.
FITNESS (1/F)	331 S.F.
AMENITY SUB-TOTAL	2,786 S.F.
AMENITY REQUIRED: 128x15 S.F. =	1,920
OUTDOOR SEATING	400 S.F.
POOL DECK/POOL/SPA	2,353 S.F.

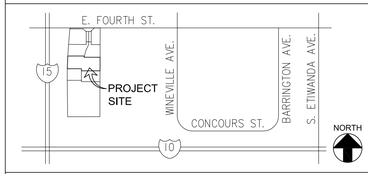
FIRST FLOOR BREAKDOWN			
LOBBY	504 S.F.	CART	31 S.F.
RECEPTION	110 S.F.		
STAFF LAUNDRY	437 S.F.	STORAGE	26 S.F.
ELEC. RM.	224 S.F.	GUEST LAUNDRY	319 S.F.
PUBLIC RESTROOM	61 S.F.	ENGINEERING RM.	187 S.F.
TRAINING	148 S.F.	ELEV. MECH.	53 S.F.



1 Overall Site Dimension Plan SCALE: 1"=100'-0"

Vicinity Map

SCALE: N.T.S.

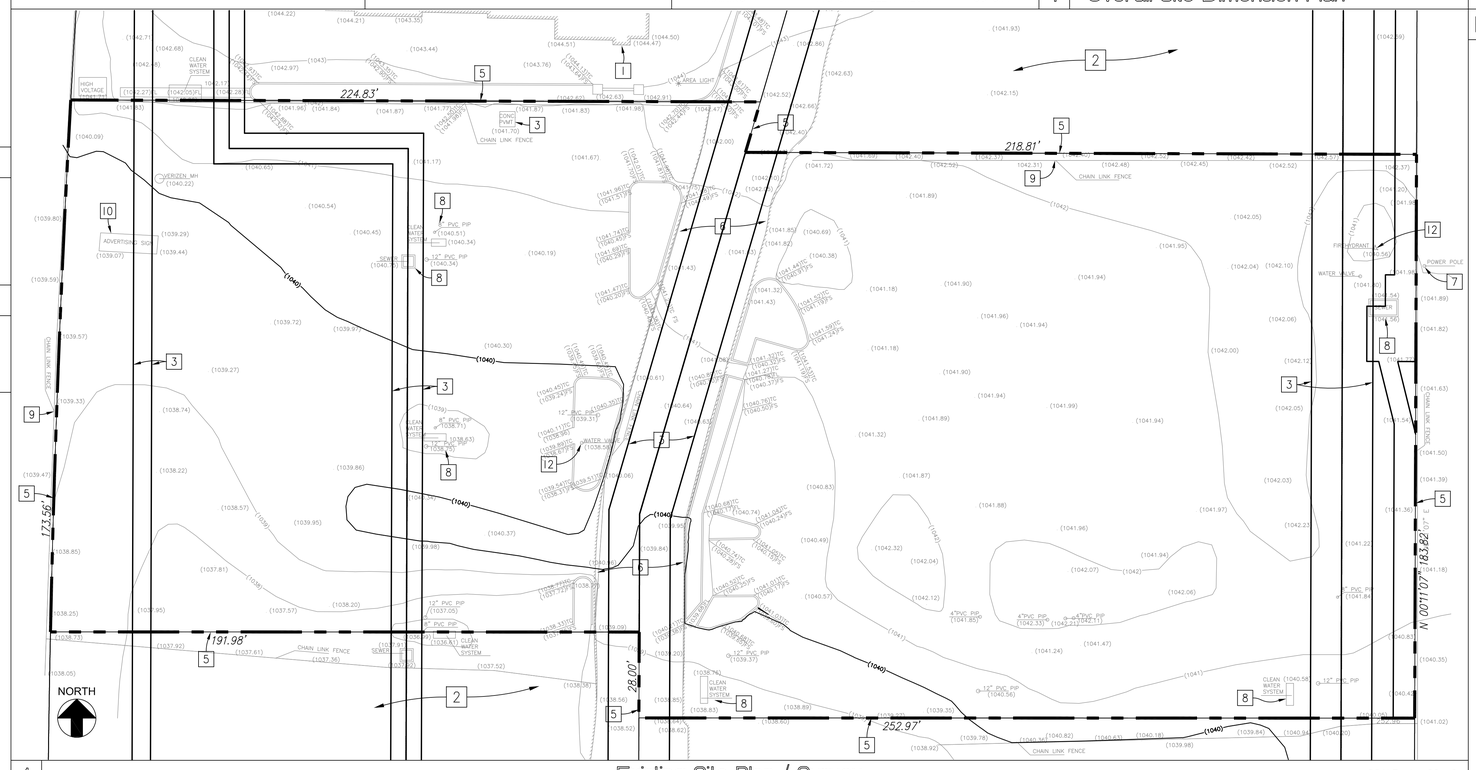


Project Description

NEW DEVELOPMENT OF 4-STORY 128 ROOMS EXTENDED STAY/ RESIDENCE INN HOTEL, 118 ON-SITE PARKING SPACES (INCL. 5 HCP & 7 EV). TOTAL BUILDING AREA IS 55,250 S.F.
HOTEL SIGNAGE UNDER SEPARATE APPLICATION.
HOURS OF OPERATION: 24x7
NUMBER OF EMPLOYEE: 6 EMPLOYEES (FULL & PART TIME)
3 @ DAY/2 @ NIGHT/1 GRAVE YARD SHIFT

Reference Notes

1. (E) COMMERCIAL BUILDING, NOT A PART.
2. (E) VACANT LAND, NOT A PART.
3. (E) UTILITY EASEMENT, SEE CIVIL PLAN.
4. (E) CENTER LINE OF STREET.
5. (E) PROPERTY LINE.



1 Existing Site Plan / Survey SCALE: 1"=20'-0"

Reference Notes

1. (E) COMMERCIAL BUILDING, NOT A PART.
2. (E) VACANT LAND, NOT A PART.
3. (E) UTILITY EASEMENT, SEE CIVIL PLAN.
4. (E) CENTER LINE OF STREET.
5. (E) PROPERTY LINE.
6. (E) 30'-0" WIDE ASPHALT PAVED ROAD TO REMAIN.
7. (E) POWER POLE & GUY WIRE TO REMAIN.
8. (E) SITE DRAINAGE SYSTEM, SEE CIVIL PLAN.
9. (E) METAL FENCE.
10. (E) PYLON SIGN TO REMAIN.
11. REMOVE & DISPOSE (E) METAL FENCE.
12. (E) FIRE HYDRANT.

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W&W LAND DESIGN CONSULTANTS INC.
ARCHITECTURE, CIVIL ENGINEERING & INTERIOR
2335 W. FOOTHILL BLVD., STE 1, UPLAND, CA 91786
PHONE: (909) 608-7118 FAX: (909) 946-1137

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PROJECT: NEW DEVELOPMENT OF 4-STORY BRANDED EXTENDED STAY / RESIDENCE INN HOTEL (128 ROOMS)
ADDRESS: 5060 E. 4TH ST., ONTARIO, CA 91764
CLIENT: ROGER BARBOSA (PRINCIPAL) MILESTONE MANAGEMENT 9891 IRVINE CENTER DR., SUITE #200 IRVINE, CA 92618 TEL.: (714) 321-8557

SHEET TITLE:
PROJECT DATA, DIRECTORY, VICINITY MAP, ABBREVIATIONS, OVERALL SITE DIMENSION PLAN & REFERENCE NOTES

KEY MAP:

SEAL/STAMP

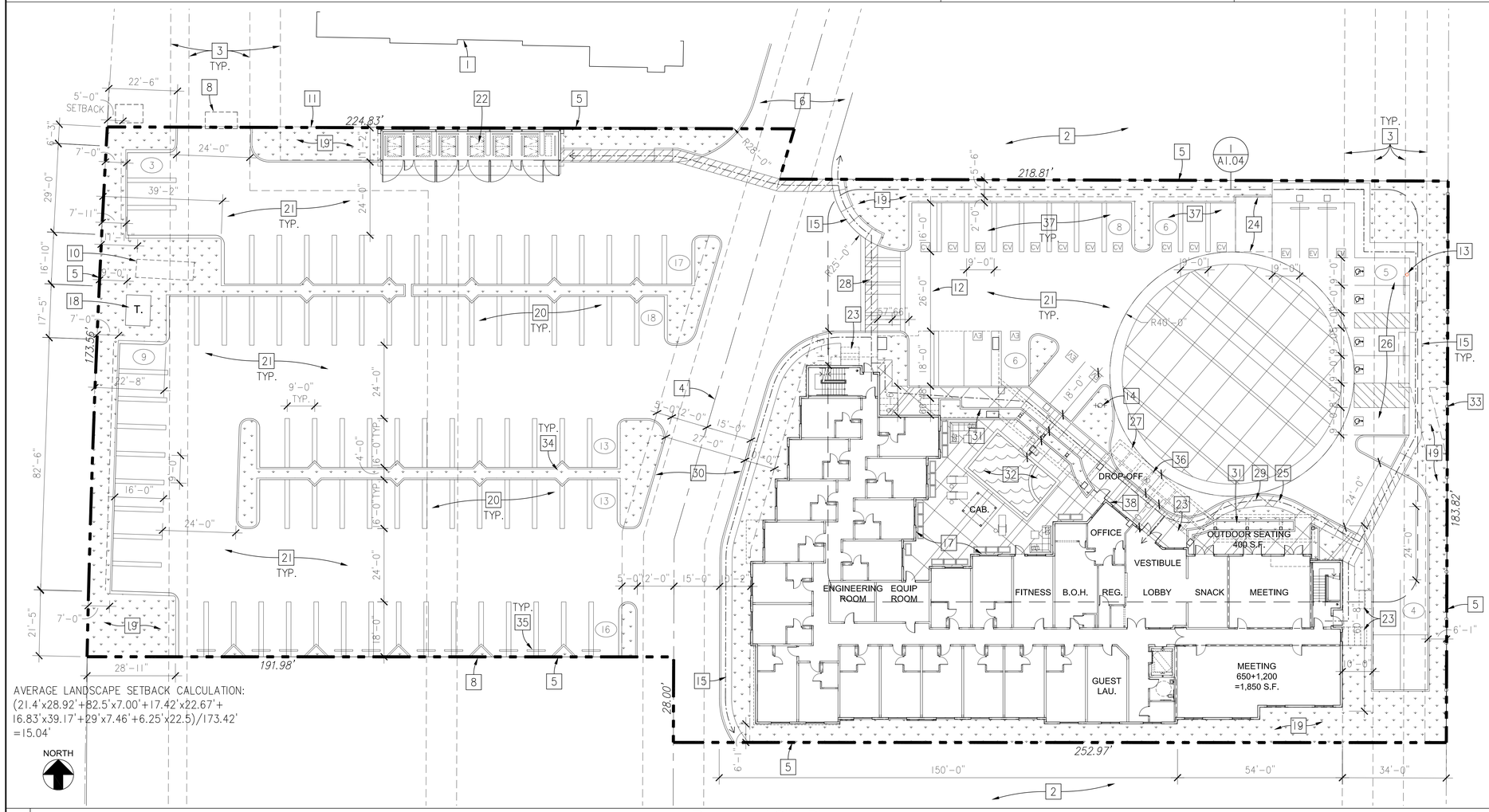
JOB NO.	2108AR
DRAWN BY:	CL
SUPERVISED BY:	TL
CHECKED BY:	TL
PLAN CHECK	
PERMIT SET	__/__/____
BID SET	__/__/____

REVISIONS

PLANNING SUBMITTAL	JUN 4, 2021
PLANNING MEETING	JUL 27, 2021
PLANNING OFF-SITE	AUG 12, 2021
OWNER REVIEW	AUG 20, 2021
PLANNING REVIEW	SEP 10, 2021
PLANNING RE-SUBMITTAL	SEP 22, 2021

SHEET NO:
T
OF SHEETS
SHEET

3608



AVERAGE LANDSCAPE SETBACK CALCULATION:
(21.4'x28.92'+82.5'x7.00'+17.42'x22.67'+
16.83'x39.17'+29'x7.46'+6.25'x22.5)/173.42'
=15.04'

1 Proposed Site Plan

SCALE: 1/16"=1'-0"

Reference Notes

1. (E) COMMERCIAL BUILDING, NOT A PART.
2. (E) VACANT LAND, NOT A PART.
3. (E) UTILITY EASEMENT, SEE CIVIL PLAN.
4. (E) CENTER LINE OF STREET.
5. (E) PROPERTY LINE.
6. (E) 30'-0" WIDE ASPHALT PAVED ROAD TO REMAIN.
7. (E) POWER POLE & GUY WIRE TO REMAIN.
8. (E) SITE DRAINAGE SYSTEM, SEE CIVIL PLAN.
9. (E) METAL FENCE TO REMAIN, NOT A PART.
10. (E) PYLON SIGN TO REMAIN.
11. REMOVE & DISPOSE (E) METAL FENCE.
12. 26'-0" FIRE LANE.
13. (E) FIRE HYDRANT TO RELOCATE.
14. (N) FIRE HYDRANT.
15. (N) SIDEWALK.
16. REMOVE & DISPOSE (E) CURB & GUTTER, SEE CIVIL PLAN.
17. PROPOSED NEW HOTEL BUILDING, SEE A2.01 FLOOR PLAN.
18. PROPOSED TRANSF. PAD (8'x10').
19. PROPOSED LANDSCAPE AREA.
20. PROPOSED ASPHALT PAVED PARKING AREA.
21. PROPOSED ASPHALT PAVED DRIVEWAY.
22. PROPOSED TRASH ENCLOSURE PER CITY STD, SEE (2/A1.03)
23. PROPOSED BIKE PARKING/STORAGE AT 12 LOCATIONS. (5% LONG-TERM + 5% SHORT-TERM)
24. PROPOSED LOADING/UNLOADING (12'-0"x18'-0").
25. 4' WIDE POURED IN PLACE CONC. WALKWAY, SCORE EVERY 4' TO 6', BROOM-SWEPT FINISH, SEE HARDSCAPE PLAN.
26. PROPOSED ADA PARKING & LOADING AT FIVE LOCATIONS.
27. PROPOSED ENTRY CANOPY, SEE FLOOR PLAN.
28. PROPOSED CROSS WALKWAY TO PUBLIC RIGHT OF WAY.
29. PROPOSED PATH OF TRAVEL.
30. PROPOSED 27'-0" DRIVEWAY.
31. PROPOSED 2'-0" HT. PLANTER W/ 4'-0" HT. GLASS PANEL.
32. PROPOSED POOL AND WHIRLPOOL/SPA.
33. PROPOSED 6'-0" HT. DECORATIVE W.I. FENCE.
34. PROPOSED 5'-0"x5'-0" TREE WELL.
35. WHEEL STOP.
36. PROPOSED PASSENGER LOADING/UNLOADING AREA.
37. PROPOSED CV/VAN POOL SPACE AT 11 LOCATIONS.
38. PROPOSED LOCATION FOR RECESSED MAILBOX, SIZE DETERMINED BY POST OFFICE.

Legend

- PATH OF TRAVEL
- LANDSCAPE AREA
- (E) FIRE HYDRANT
- FIRE DEPT. CONNECTION
- (N) FIRE HYDRANT & CONNECTION
- (E) CHAIN LINK FENCE

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PROJECT: NEW DEVELOPMENT OF 4-STORY BRANDED EXTENDED STAY / RESIDENCE INN HOTEL (128 ROOMS)
ADDRESS: 5060 E. 4TH ST., ONTARIO, CA 91764

CLIENT: ROGER BARBOSA (PRINCIPAL)
MILESTONE MANAGEMENT
18831 VON KARMAN AVE., SUITE #200
IRVINE, CA 92612
TEL.: (714) 321-8557

SHEET TITLE: PROPOSED SITE PLAN (OPTION 'A')

KEY MAP:

SEAL/STAMP

JOB NO.	2108AR
DRAWN BY:	CL
SUPERVISED BY:	TL
CHECKED BY:	TL
PLAN CHECK	
PERMIT SET	__/__/____
BID SET	__/__/____

REVISIONS

1	PLANNING SUBMITTAL	JUN 4, 2021
2	PLANNING MEETING	JUL 27, 2021
3	PLANNING OFF-SITE	AUG 12, 2021
4	OWNER REVIEW	AUG 20, 2021
5	PLANNING REVIEW	SEP 10, 2021
6	PLANNING RE-SUBMITTAL	SEP 22, 2021

SHEET NO:

A1.01

OF SHEETS

SHEET

ATTACHMENT B

ULI PEAK PARKING DEMAND SUMMARY

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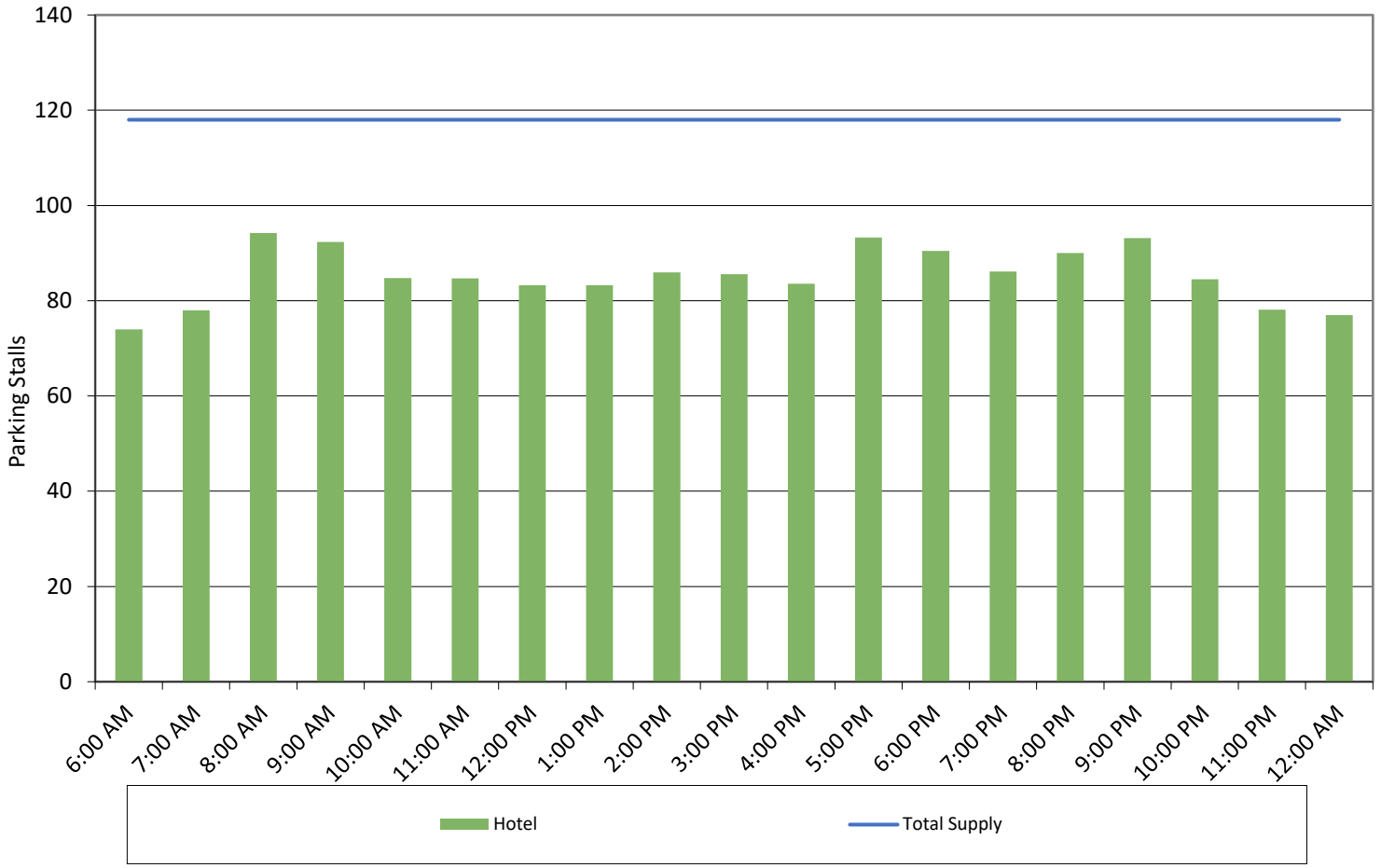
Project: Extended Stay
Description: 128 room hotel

Shared Parking Demand Summary
Peak Month: MARCH -- Peak Period: 8 AM, WEEKEND

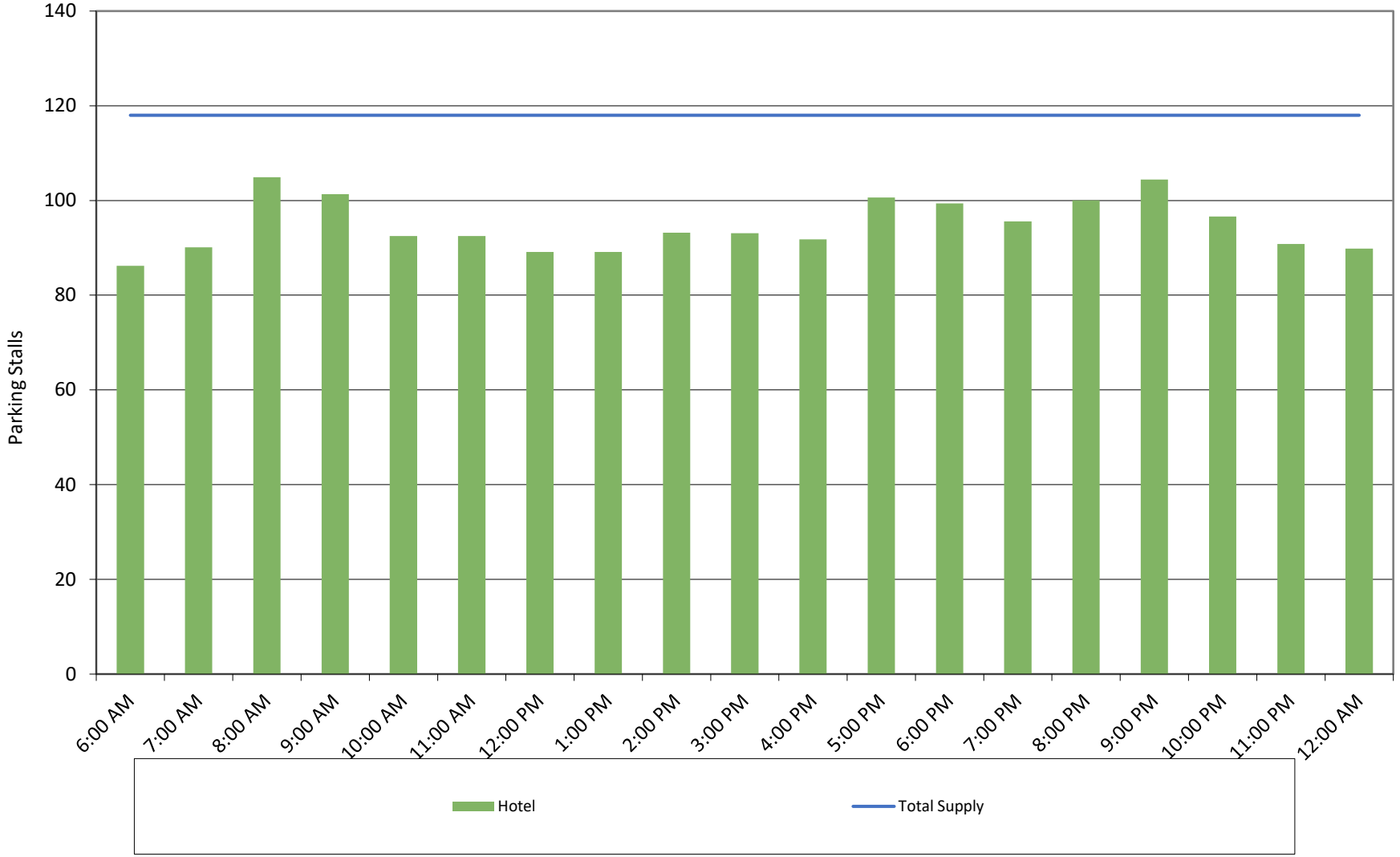
Land Use	Project Data		Weekday					Weekend					Weekday			Weekend		
	Quantity	Unit	Base Ratio	Driving Adj	Non-Captive Ratio	Project Ratio	Unit For Ratio	Base Ratio	Driving Adj	Non-Captive Ratio	Project Ratio	Unit For Ratio	Peak Hr Adj 8 AM	Peak Mo Adj March	Estimated Parking Demand	Peak Hr Adj 8 AM	Peak Mo Adj March	Estimated Parking Demand
Retail																		
Food and Beverage																		
Entertainment and Institutions																		
Hotel and Residential																		
Hotel-Business		keys	1.00	59%	100%	0.59	key	1.00	69%	100%	0.69	key	80%	90%	-	80%	90%	-
Hotel-Leisure	128	keys	1.00	59%	100%	0.59	key	1.00	69%	100%	0.69	key	90%	100%	68	90%	100%	79
Hotel Employees	128	keys	0.15	100%	100%	0.15	key	0.15	100%	100%	0.15	key	100%	100%	19	100%	100%	19
Restaurant/Lounge	331	sf GLA	6.67	63%	90%	3.78	ksf GLA	7.67	54%	30%	1.24	ksf GLA	30%	95%	-	30%	95%	-
Meeting/Banquet (0 to 20 sq ft/key)	1,824	sf GLA	21.38	68%	60%	8.72	ksf GLA	14.25	68%	70%	6.78	ksf GLA	30%	100%	5	30%	100%	4
Meeting/Banquet (20 to 50 sq ft/key)		sf GLA	0.00	68%	60%	0.00	ksf GLA	0.00	68%	70%	0.00	ksf GLA	30%	100%	-	30%	100%	-
Meeting/Banquet (50 to 100 sq ft/key)		sf GLA	0.00	68%	60%	0.00	ksf GLA	0.00	68%	70%	0.00	ksf GLA	30%	100%	-	30%	100%	-
Convention (100 to 200 sq ft/key)		sf GLA	0.00	68%	60%	0.00	ksf GLA	5.50	68%	70%	2.62	ksf GLA	50%	90%	-	50%	90%	-
Convention (> 200 sq ft/key)		sf GLA	5.50	68%	60%	2.24	ksf GLA	5.50	68%	70%	2.62	ksf GLA	50%	90%	-	50%	90%	-
Restaurant/Meeting Employees	2,155	sf GLA	1.39	100%	100%	1.39	ksf GLA	1.41	100%	100%	1.41	ksf GLA	60%	100%	2	60%	100%	2
Office																		
Additional Land Uses																		

Customer/Visitor	73	Customer	83
Employee/Resident	21	Employee/Resident	21
Reserved	-	Reserved	-
Total	94	Total	104

Peak Month Daily Parking Demand by Hour (Weekday)



Peak Month Daily Parking Demand by Hour (Weekend)



RESOLUTION NO. PC22-011

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF ONTARIO, CALIFORNIA, RECOMMENDING APPROVAL TO CITY COUNCIL FOR FILE NO. PCUP21-009, A CONDITIONAL USE PERMIT TO ESTABLISH AND OPERATE A LIMITED-SERVICE HOTEL ON 1.83 ACRES OF LAND LOCATED AT 5060 EAST FOURTH STREET, WITHIN THE FREEWAY COMMERCIAL LAND USE DISTRICT OF THE EXCHANGE SPECIFIC PLAN, AND MAKING FINDINGS IN SUPPORT THEREOF—APN: 0238-012-30.

WHEREAS, ROGER BARBOSA ("Applicant") has filed an Application for the approval of a Conditional Use Permit, File No. PCUP21-009, as described in the title of this Resolution (hereinafter referred to as "Application" or "Project"); and

WHEREAS, the Application applies to 1.83 acres of land located at 5060 East Fourth Street, within the Freeway Commercial land use district of The Exchange Specific Plan, and the site is presently vacant; and

WHEREAS, the property to the north of the Project site is within the Freeway Commercial land use district of The Exchange Specific Plan and is developed with a multi-tenant retail building. The property to the east is within the Open Space zoning district and is developed with Southern California Edison transmission lines. The property to the south is within the Freeway Commercial land use district of The Exchange Specific Plan and is currently vacant. The property to the west is Interstate 15; and

WHEREAS, on June 4, 2021, the Applicant submitted File No. PCUP21-009, a Conditional Use Permit application requesting approval to establish and operate a limited-service hotel land use on the Project site; and

WHEREAS, the proposed Conditional Use Permit was submitted for concurrent processing with File No. PDEV21-021, a Development Plan to construct a 4-story, 128-room Extended Stay Hotel on the Project site; and

WHEREAS, in 2003, the City approved The Exchange Specific Plan, a 23.60-acre master plan for the project area. The Exchange Specific Plan is composed of two land use districts, including the Freeway Commercial land use district, which comprises the northerly 12.03 acres of the Specific Plan, and the Industrial Park land use district, which comprises the southerly 11.57 acres of the Specific Plan; and

WHEREAS, the City's Development Code requires that all new hotels must be reviewed under concurrently filed Conditional Use Permit and Development Plan applications. The purpose of the Conditional Use Permit application and review is to ensure that the proposed use will be operated in a manner consistent with all local regulations, and to ensure the use will not be detrimental to the public health, safety, or

welfare, or materially injurious to uses, properties or improvements in the vicinity. More specifically, in the case of hotels, the Conditional Use Permit is required to establish the project's market feasibility and ensure on-going compliance with the minimum amenity package required by the Development Code; and

WHEREAS, in fulfillment of the requirements of Development Code Section 5.03.250.C (Market Feasibility Report Required), the Applicant has submitted a Market Feasibility Study, which demonstrates that the local market can support the development of a new hotel. The Study, prepared by Veritas Development Advisors (dated October 21, 2021), includes analysis and market research related to the proposed project. The Study found that the local market can support a limited-service hotel on the Project site. The study's conclusions are based primarily upon the growth in the Inland Empire, the area's proximity to the Los Angeles area, the Ontario Convention Center, the Ontario International Airport, California Speedway in Fontana, and the Project's proximity to the Ontario Mills Mall. The report includes an analysis of other similar hotels in the area, long-term viability, and overall demand due to new businesses and activities in and around the City; and

WHEREAS, the proposed Project has met or exceeded the minimum amenity package requirements, as stipulated by Section 5.03.250.D (Minimum Amenity Package) of the City's Development Code; and

WHEREAS, the Application is a project pursuant to the California Environmental Quality Act, commencing with Public Resources Code Section 21000 (hereinafter referred to as "CEQA"); and

WHEREAS, the Project is exempt from CEQA pursuant to a categorical exemption (listed in CEQA Guidelines Article 19, commencing with Section 15300) and the application of that categorical exemption is not barred by one of the exceptions set forth in CEQA Guidelines Section 15300.2; and

WHEREAS, Ontario Development Code Table 2.02-1 (Review Matrix) grants the Planning Commission the responsibility and authority to review and make recommendation to the City Council on the subject Application; and

WHEREAS, the Project has been reviewed for consistency with the Housing Element of the Policy Plan component of The Ontario Plan, as State Housing Element law (as prescribed in Government Code Sections 65580 through 65589.8) requires that development projects must be consistent with the Housing Element, if upon consideration of all its aspects, it is found to further the purposes, principals, goals, and policies of the Housing Element; and

WHEREAS, the Project is located within the Airport Influence Area of Ontario International Airport, which encompasses lands within parts of San Bernardino, Riverside, and Los Angeles Counties, and is subject to, and must be consistent with, the policies and criteria set forth in the Ontario International Airport Land Use Compatibility Plan ("ALUCP"), which applies only to jurisdictions within San Bernardino County, and addresses the noise, safety, airspace protection, and overflight impacts of current and future airport activity; and

WHEREAS, City of Ontario Development Code Division 2.03 (Public Hearings) prescribes the manner in which public notification shall be provided and hearing procedures to be followed, and all such notifications and procedures have been completed; and

WHEREAS, on February 7, 2022, the Development Advisory Board of the City of Ontario conducted a hearing to consider the Project, and concluded said hearing on that date, voting to issue Decision No. DAB22-007, recommending that the Planning Commission recommend the City Council approve the Application; and

WHEREAS, on February 22, 2022, the Planning Commission of the City of Ontario conducted a hearing to consider the Project, and concluded said hearing on that date; and

WHEREAS, all legal prerequisites to the adoption of this Resolution have occurred.

NOW, THEREFORE, IT IS HEREBY FOUND, DETERMINED, AND RESOLVED by the Planning Commission of the City of Ontario, as follows:

SECTION 1: ***Environmental Determination and Findings.*** As the recommending authority for the Project, the Planning Commission has reviewed and considered the information contained in the administrative record for the Project. Based upon the facts and information contained in the administrative record, including all written and oral evidence presented to the Planning Commission, the Planning Commission finds as follows:

(1) The administrative record has been completed in compliance with CEQA, the State CEQA Guidelines, and the City of Ontario Local CEQA Guidelines; and

(2) The Project is categorically exempt from environmental review pursuant to Section 15332 (Class 32, In-Fill Development Projects) of the CEQA Guidelines, which consists of: (a) the Project is consistent with the applicable general plan designation and all applicable general plan policies, as well as the applicable zoning designation and regulations; (b) the proposed development occurs within city limits, on a project site of no more than five acres, and is substantially surrounded by urban uses; (c) the Project site

has no value as habitat for endangered, rare, or threatened species; (d) approval of the Project will not result in any significant effects relating to traffic, noise, air quality, or water quality; and (e) the Project site is adequately served by all required utilities and public services; and

(3) The application of the categorical exemption is not barred by one of the exceptions set forth in CEQA Guidelines Section 15300.2; and

(4) The determination of CEQA exemption reflects the independent judgment of the Planning Commission.

SECTION 2: ***Housing Element Compliance.*** Pursuant to the requirements of California Government Code Chapter 3, Article 10.6, commencing with Section 65580, as the recommending authority for the Project, the Planning Commission finds that based on the facts and information contained in the Application and supporting documentation, at the time of Project implementation, the project is consistent with the Housing Element of the Policy Plan (General Plan) component of The Ontario Plan, as the project site is not one of the properties in the Available Land Inventory contained in Table A-3 (Available Land by Planning Area) of the Housing Element Technical Report Appendix.

SECTION 3: ***Ontario International Airport Land Use Compatibility Plan ("ALUCP") Compliance.*** The California State Aeronautics Act (Public Utilities Code Section 21670 et seq.) requires that an Airport Land Use Compatibility Plan be prepared for all public use airports in the State; and requires that local land use plans and individual development proposals must be consistent with the policies set forth in the adopted Airport Land Use Compatibility Plan. On April 19, 2011, the City Council of the City of Ontario approved and adopted the ALUCP, establishing the Airport Influence Area for Ontario International Airport (hereinafter referred to as "ONT"), which encompasses lands within parts of San Bernardino, Riverside, and Los Angeles Counties, and limits future land uses and development within the Airport Influence Area, as they relate to noise, safety, airspace protection, and overflight impacts of current and future airport activity. As the recommending authority for the Project, the Planning Commission has reviewed and considered the facts and information contained in the Application and supporting documentation against the ALUCP compatibility factors, including [1] Safety Criteria (ALUCP Table 2-2) and Safety Zones (ALUCP Map 2-2), [2] Noise Criteria (ALUCP Table 2-3) and Noise Impact Zones (ALUCP Map 2-3), [3] Airspace protection Zones (ALUCP Map 2-4), and [4] Overflight Notification Zones (ALUCP Map 2-5). As a result, the PLANNING COMMISSION, therefore, finds and determines that the Project, when implemented in conjunction with the conditions of approval, will be consistent with the policies and criteria set forth within the ALUCP.

SECTION 4: ***Concluding Facts and Reasons.*** Based upon the substantial evidence presented to the Planning Commission during the above-referenced hearing,

and upon the specific findings set forth in Sections 1 through 3, above, the Planning Commission hereby concludes as follows:

(1) ***The scale and intensity of the proposed land use would be consistent with the scale and intensity of land uses intended for the particular zoning or land use district.*** The proposed location of the Conditional Use Permit is in accord with the objectives and purposes of the City of Ontario Development Code and The Exchange Specific Plan, and the scale and intensity of land uses intended for the Freeway Commercial land use district in which the use is proposed to be located. Furthermore, the proposed 128-room, hotel land use will be established and operated consistent with the objectives and purposes, and development standards and guidelines of the Freeway Commercial land use designation of The Exchange Specific Plan; and

(2) ***The proposed use at the proposed location, and the manner in which it will be operated and maintained, is consistent with the goals, policies, plans and exhibits of the Vision, Policy Plan (General Plan), and City Council Priorities components of The Ontario Plan.*** The proposed 128-room hotel land use will be located within the Planned Commercial land use district of the Policy Plan Land Use Map, and the Freeway Commercial land use district of The Exchange Specific Plan. The development standards, and the conditions of approval under which the proposed land use will be established, operated, and maintained, are consistent with the goals, policies, plans, and exhibits of the Vision, City Council Priorities, and Policy Plan (General Plan) components of The Ontario Plan; and

(3) ***The proposed use at the proposed location, and the manner in which it will be operated and maintained, is consistent with the objectives and requirements of the Development Code and any applicable specific plan or planned unit development.*** The proposed 128-room hotel land use is located with the Freeway Commercial land use district of The Exchange Specific Plan and has been reviewed and conditioned to ensure the establishment, operation and maintenance of the proposed land use consistent with all applicable objectives, purposes, standards, and guidelines of the Development Code and The Exchange Specific Plan; and

(4) ***The establishment, maintenance, and operation of the proposed use at the proposed location would not be detrimental or injurious to property and improvements within the vicinity, nor would it be detrimental to the health, safety, or general welfare of persons residing or working in the surrounding neighborhood.*** The Development Advisory Board has required certain safeguards, and impose certain conditions of approval, which have been established to ensure that: [i] the purposes of The Exchange Specific Plan are maintained; [ii] the project will not endanger the public health, safety or general welfare; [iii] the project will not result in any significant environmental impacts; and [iv] the project will be in harmony with the surrounding area in which it is proposed to be located.

SECTION 5: ***Planning Commission Action.*** Based upon the findings and conclusions set forth in Sections 1 through 4, above, the Planning Commission hereby RECOMMENDS THE CITY COUNCIL APPROVE the herein described Application, subject to each and every condition set forth in the Department reports attached hereto as "Attachment A," and incorporated herein by this reference.

SECTION 6: ***Indemnification.*** The Applicant shall agree to defend, indemnify and hold harmless, the City of Ontario or its agents, officers, and employees from any claim, action or proceeding against the City of Ontario or its agents, officers or employees to attack, set aside, void, or annul this approval. The City of Ontario shall promptly notify the applicant of any such claim, action, or proceeding, and the City of Ontario shall cooperate fully in the defense.

SECTION 7: ***Custodian of Records.*** The documents and materials that constitute the record of proceedings on which these findings have been based are located at the City of Ontario City Hall, 303 East "B" Street, Ontario, California 91764. The custodian for these records is the City Clerk of the City of Ontario.

SECTION 8: ***Certification to Adoption.*** The Secretary shall certify to the adoption of the Resolution.

- - - - - - - - - - - - - -

The Secretary Pro Tempore for the Planning Commission of the City of Ontario shall certify as to the adoption of this Resolution.

I hereby certify that the foregoing Resolution was duly and regularly introduced, passed and adopted by the Planning Commission of the City of Ontario at a regular meeting thereof held on the 22nd day of February 2022, and the foregoing is a full, true and correct copy of said Resolution, and has not been amended or repealed.

Rick Gage
Planning Commission Chairman

ATTEST:

Rudy Zeledon
Planning Director and
Secretary to the Planning Commission

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, Gwen Berendsen, Secretary Pro Tempore of the Planning Commission of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. PC22-011, was duly passed and adopted by the Planning Commission of the City of Ontario at their regular meeting held on February 22, 2022, by the following roll call vote, to wit:

AYES: Anderson, Dean, DeDiemar, Gage, Lampkin, Ricci, Willoughby

NOES: None

ABSENT: None

ABSTAIN: None

Gwen Berendsen
Secretary Pro Tempore

ATTACHMENT A:

File No. PCUP21-009
Departmental Conditions of Approval

(Departmental conditions of approval to follow this page)

LAND DEVELOPMENT DIVISION
CONDITIONS OF APPROVAL

CITY OF ONTARIO PLANNING DEPARTMENT
303 East B Street, Ontario, California 91764 Phone: 909.395.2036 / Fax: 909.395.2420

Date Prepared: 1/24/2022

File No: PCUP21-009

Related Files: N/A

Project Description: A Conditional Use Permit (File No. PCUP21-009) to establish and operate a limited-service hotel use on 1.83 acres of land located at 5060 East Fourth Street, within the Freeway Commercial land use district of The Exchange Specific Plan. (APN: 0238-012-30); submitted by Roger Barbosa.

Prepared By: Luis E. Batres, Senior Planner
Phone: 909.395.2431 (direct)
Email: Lbatres@ontarioca.gov

The Planning Department, Land Development Section, conditions of approval applicable to the above-described Project, are listed below. The Project shall comply with each condition of approval listed below:

1.0 Standard Conditions of Approval. The project shall comply with the *Standard Conditions for New Development*, adopted by City Council Resolution No. 2017-027 on April 18, 2017. A copy of the *Standard Conditions for New Development* may be obtained from (https://www.ontarioca.gov/Planning/Applications) or from the Planning Department/City Clerk/Records Management Department.

2.0 Special Conditions of Approval. In addition to the *Standard Conditions for New Development* identified in condition no. 1.0, above, the project shall comply with the following special conditions of approval:

2.1 Time Limits. Conditional Use Permit approval shall become null and void one year following the effective date of application approval, unless a building permit is issued and construction is commenced, and diligently pursued toward completion, or a time extension has been approved by the Planning Director, except that a Conditional Use Permit approved in conjunction with a Development Plan shall have the same time limits as said Development Plan. This condition does not supersede any individual time limits specified herein, or any other departmental conditions of approval applicable to the Project, for the performance of specific conditions or improvements.

2.2 General Requirements. The Project shall comply with the following general requirements:

(a) All construction documentation shall be coordinated for consistency, including, but not limited to, architectural, structural, mechanical, electrical, plumbing, landscape

and irrigation, grading, utility and street improvement plans. All such plans shall be consistent with the approved entitlement plans on file with the Planning Department.

(b) The project site shall be developed in conformance with the approved plans on file with the City. Any variation from the approved plans must be reviewed and approved by the Planning Department prior to building permit issuance.

(c) The herein-listed conditions of approval from all City departments shall be included in the construction plan set for project, which shall be maintained on site during project construction.

(d) The project shall provide a total of 118 parking spaces. In the future, if it is determined by the Planning Department as a result of complaints received that additional parking is necessary, the Applicant shall enter into a reciprocal parking agreement with adjacent developments to provide the additional parking (additional 10 parking spaces).

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, APPROVING FILE NO. PCUP21-009, A CONDITIONAL USE PERMIT TO ESTABLISH AND OPERATE A 128-ROOM LIMITED-SERVICE HOTEL ON 1.83 ACRES OF LAND LOCATED AT 5060 EAST FOURTH STREET, WITHIN THE FREEWAY COMMERCIAL LAND USE DISTRICT OF THE EXCHANGE SPECIFIC PLAN AND MAKING FINDINGS IN SUPPORT THEREOF - APN: 0238-012-30.

WHEREAS, ROGER BARBOSA ("Applicant") has filed an Application for the approval of File No. PCUP21-009, a Conditional Use Permit as described in the title of this Resolution (hereinafter referred to as "Application" or "Project"); and

WHEREAS, the Application applies to 1.83 acres of land located at 5060 East Fourth Street, within the Freeway Commercial land use district of The Exchange Specific Plan, and the site is presently vacant; and

WHEREAS, the property to the north of the Project site is within the Freeway Commercial land use district of The Exchange Specific Plan and is developed with a multi-tenant retail building. The property to the east is within the Open Space zoning district and is developed with Southern California Edison transmission lines. The property to the south is within the Freeway Commercial land use district of The Exchange Specific Plan and is currently vacant. The property to the west is Interstate 15; and

WHEREAS, on June 4, 2021, the Applicant submitted File No. PCUP21-009, a Conditional Use Permit application requesting approval to establish and operate a limited-service hotel on the Project site; and

WHEREAS, the proposed Conditional Use Permit was submitted for concurrent processing with File No. PDEV21-021, a Development Plan to construct a four-story, 128-room Extended Stay Hotel on the Project site; and

WHEREAS, in 2003, the City approved The Exchange Specific Plan, a 23.60 acre master plan for the project area. The Exchange Specific Plan is composed of two land use districts, including the Freeway Commercial, which comprises the northerly 12.03 acres of the Specific Plan, and the Industrial Park land use district, which comprises the southerly 11.57 acres of the Specific Plan; and

WHEREAS, the City's Development Code requires that all new hotels must be reviewed under concurrently filed Conditional Use Permit and Development Plan applications. The purpose of the Conditional Use Permit application and review is to ensure that the proposed use will be operated in a manner consistent with all local regulations, and to ensure the use will not be detrimental to the public health, safety, or welfare, or materially injurious to uses, properties or improvements in the vicinity. More specifically, in the case of hotels, the Conditional Use Permit is required to establish the project's market feasibility and ensure on-going compliance with the minimum amenity package required by the Development Code; and

WHEREAS, Development Code Section 5.03.250.D (Minimum Amenity Package) stipulates that no Conditional Use Permit shall be approved for a hotel, motel, residence inn, or other similar traveler accommodation, unless certain specific amenities are provided and permanently maintained, as described below:

- Each guestroom shall include voicemail, wired or wireless internet access, desk with chair, hairdryer, retractable magnifying (10X) and lighted makeup mirror, iron and ironing board, high definition television, and alarm clock or wake-up service. Compliance with these requirements will be verified by the Planning Department during Building Department plan check and at time of final building inspection; and

- For limited-service hotels, meeting space equal to 15 square feet per guestroom shall be provided, requiring that Project provide a minimum of 1,920 square feet of meeting/gathering area. The Project exceeds the minimum requirement, incorporating a total of 2,250 square feet of available meeting/gathering area; and

- Both active and passive leisure amenities are required. At a minimum, the Project must provide a swimming pool, whirlpool/spa or furnished cabana, and fitness room. The Project exceeds the minimum requirement, providing a pool and spa, poolside cabana, outdoor seating areas, and a fitness room; and

- A guest courtesy lounge for the serving of light meals and snacks is required to be provided in conjunction with limited-service hotels. The Project has provided a 331-square-foot café/snack room for hotel guests, meeting the minimum requirement; and

WHEREAS, in fulfillment of the requirements of Development Code Section 5.03.250.C (Market Feasibility Report Required), the Applicant has submitted a Market Feasibility Study, which demonstrates that the local market can support the development of a new hotel. The Study, prepared by Veritas Development Advisors (dated October 21, 2021), includes analysis and market research related to the proposed project. The Study found that the local market can support a limited-service hotel on the Project site. The study's conclusions are based primarily upon the growth in the Inland Empire, the area's proximity to the Los Angeles area, the Ontario Convention Center, the Ontario International Airport, California Speedway in Fontana, and the Project's proximity to the Ontario Mills Mall. The report includes an analysis of other similar hotels in the area, long-term viability, and overall demand due to new businesses and activities in and around the City; and

WHEREAS, the Application is a project pursuant to the California Environmental Quality Act, commencing with Public Resources Code Section 21000 (hereinafter referred to as "CEQA"); and

WHEREAS, the Project is exempt from CEQA pursuant to a categorical exemption (listed in CEQA Guidelines Article 19, commencing with Section 15300) and the application of that categorical exemption is not barred by one of the exceptions set forth in CEQA Guidelines Section 15300.2; and

WHEREAS, Ontario Development Code Table 2.02-1 (Review Matrix) grants the City Council the responsibility and authority to review and act on the subject Application; and

WHEREAS, the Project has been reviewed for consistency with the Housing Element of the Policy Plan component of The Ontario Plan, as State Housing Element law (as prescribed in Government Code Sections 65580 through 65589.8) requires that development projects must be consistent with the Housing Element, if upon consideration of all its aspects, it is found to further the purposes, principals, goals, and policies of the Housing Element; and

WHEREAS, the Project is located within the Airport Influence Area of Ontario International Airport, which encompasses lands within parts of San Bernardino, Riverside, and Los Angeles Counties, and is subject to, and must be consistent with, the policies and criteria set forth in the Ontario International Airport Land Use Compatibility Plan ("ALUCP"), which applies only to jurisdictions within San Bernardino County, and addresses the noise, safety, airspace protection, and overflight impacts of current and future airport activity; and

WHEREAS, City of Ontario Development Code Division 2.03 (Public Hearings) prescribes the manner in which public notification shall be provided and hearing procedures to be followed, and all such notifications and procedures have been completed; and

WHEREAS, on February 7, 2022, the Development Advisory Board of the City of Ontario conducted a hearing to consider the Project, and concluded said hearing on that date, voting to issue Decision No. DAB22-007, recommending that the Planning Commission recommend the City Council approve the Application; and

WHEREAS, on February 22, 2022, the Planning Commission of the City of Ontario conducted a hearing to consider the Project and concluded said hearing on that date, voting unanimously (7-0) to issue Resolution No. PC22-01 recommending that the City Council approve the Application; and

WHEREAS, on April 19, 2022, the City Council of the City of Ontario conducted a hearing to consider the Project, and concluded said hearing on that date; and

WHEREAS, all legal prerequisites to the adoption of this Resolution have occurred.

NOW, THEREFORE, IT IS HEREBY FOUND, DETERMINED, AND RESOLVED by the City Council of the City of Ontario, as follows:

SECTION 1. ***Environmental Determination and Findings.*** As the decision-making body for the Project, the City Council has reviewed and considered the information contained in the administrative record for the Project. Based upon the facts and information contained in the administrative record, including all written and oral evidence presented to the City Council, the City Council finds as follows:

(1) The administrative record has been completed in compliance with CEQA, the State CEQA Guidelines, and the City of Ontario Local CEQA Guidelines; and

(2) The Project is categorically exempt from environmental review pursuant to Section 15332 (Class 32, In-Fill Development Projects) of the CEQA Guidelines, which consists of: (a) the Project is consistent with the applicable general plan designation and all applicable general plan policies, as well as the applicable zoning designation and regulations; (b) the proposed development occurs within city limits, on a project site of no more than five acres, and is substantially surrounded by urban uses; (c) the Project site has no value as habitat for endangered, rare, or threatened species; (d) approval of the Project will not result in any significant effects relating to traffic, noise, air quality, or water quality; and (e) the Project site is adequately served by all required utilities and public services; and

(3) The application of the categorical exemption is not barred by one of the exceptions set forth in CEQA Guidelines Section 15300.2; and

(4) The determination of CEQA exemption reflects the independent judgment of the City Council.

SECTION 2. ***Housing Element Compliance.*** Pursuant to the requirements of California Government Code Chapter 3, Article 10.6, commencing with Section 65580, as the decision-making body for the Project, the City Council finds that based on the facts and information contained in the Application and supporting documentation, at the time of Project implementation, the project is consistent with the Housing Element of the Policy Plan (General Plan) component of The Ontario Plan, as the project site is not one of the properties in the Available Land Inventory contained in Table A-3 (Available Land by Planning Area) of the Housing Element Technical Report Appendix.

SECTION 3. ***Ontario International Airport Land Use Compatibility Plan ("ALUCP") Compliance.*** The California State Aeronautics Act (Public Utilities Code Section 21670 et seq.) requires that an Airport Land Use Compatibility Plan be prepared for all public use airports in the State; and requires that local land use plans and individual development proposals must be consistent with the policies set forth in the adopted Airport Land Use Compatibility Plan. On April 19, 2011, the City Council of the City of Ontario approved and adopted the Ontario International Airport Land use Compatibility Plan ("ALUCP"), establishing the Airport Influence Area for Ontario International Airport ("ONT"), which encompasses lands within parts of San Bernardino, Riverside, and Los Angeles Counties, and limits future land uses and development within the Airport Influence Area, as they relate to noise, safety, airspace protection, and overflight impacts of current and future airport activity. As the decision-making body for the Project, the City Council has reviewed and considered the facts and information contained in the Application and supporting documentation against the ALUCP compatibility factors, including [1] Safety Criteria (ALUCP Table 2-2) and Safety Zones (ALUCP Map 2-2), [2] Noise Criteria (ALUCP Table 2-3) and Noise Impact Zones (ALUCP Map 2-3), [3] Airspace protection Zones (ALUCP Map 2-4), and [4] Overflight Notification Zones (ALUCP Map 2-5). As a result, the City Council, therefore, finds and determines that the Project, when implemented in conjunction with the conditions of approval, will be consistent with the policies and criteria set forth within the ALUCP.

SECTION 4. ***Concluding Facts and Reasons.*** Based upon the substantial evidence presented to the City Council during the above-referenced hearing, and upon the specific findings set forth in Sections 1 through 3, above, the City Council hereby concludes as follows:

(1) ***The scale and intensity of the proposed land use would be consistent with the scale and intensity of land uses intended for the particular zoning or land use district.*** The proposed location of the Conditional Use Permit is in accord with the objectives and purposes of the City of Ontario Development Code and The Exchange Specific Plan, and the scale and intensity of land uses intended for the Freeway Commercial land use district in which the use is proposed to be located. Furthermore, the proposed 128-room extended stay hotel will be established and operated consistent with the objectives and purposes, and development standards and guidelines of the Freeway Commercial land use designation of The Exchange Specific Plan, which meets the Specific Plans goal of providing a balance of employment, shopping and service opportunities, reducing the need for long commutes; and

(2) ***The proposed use at the proposed location, and the manner in which it will be operated and maintained, is consistent with the goals, policies, plans and exhibits of the Vision, Policy Plan (General Plan), and City Council Priorities components of The Ontario Plan.*** The proposed 128-room extended stay hotel will be located within the Planned Commercial land use district of the Policy Plan Land Use Map, and the Freeway Commercial land use district of The Exchange Specific Plan. A hotel land use within the Freeway Commercial land use is conditionally permitted with the approval of a Conditional Use Permit. Furthermore, the development standards, and the conditions of approval under which the proposed land use will be established, operated, and maintained, are consistent with the goals, policies, plans, and exhibits of the Vision, City Council Priorities, and Policy Plan (General Plan) components of The Ontario Plan; and

(3) ***The proposed use at the proposed location, and the manner in which it will be operated and maintained, is consistent with the objectives and requirements of the Development Code and any applicable specific plan or planned unit development.*** The proposed 128-room extended stay hotel is located with the Freeway Commercial land use district of The Exchange Specific Plan and has been reviewed and conditioned to ensure the establishment, operation and maintenance of the proposed land use is consistent with all applicable objectives, purposes, standards, and guidelines of the Development Code and The Exchange Specific Plan; and

(4) ***The establishment, maintenance, and operation of the proposed use at the proposed location would not be detrimental or injurious to property and improvements within the vicinity, nor would it be detrimental to the health, safety, or general welfare of persons residing or working in the surrounding neighborhood.*** The establishment, maintenance, and operation of the proposed 128-room extended stay hotel at the proposed location would not be detrimental or injurious to property and improvements within the vicinity, nor would it be detrimental to the health, safety, or general welfare of persons residing or working in the surrounding neighborhood. The project site is located within the Freeway Commercial land use designation of the Exchange Specific Plan

and a hotel use is a conditionally permitted use. In addition, certain safeguards are required and certain conditions of approval have been imposed, which have been established to ensure that: (i) the purposes of The Exchange Specific Plan are maintained; (ii) the project will not endanger the public health, safety or general welfare; (iii) the project will not result in any significant environmental impacts; and (iv) the project will be in harmony with the surrounding area in which it is proposed to be located.

SECTION 5. ***City Council Action.*** Based upon the findings and conclusions set forth in Sections 1 through 4, above, the City Council hereby APPROVES the herein described Conditional Use Permit subject to each and every condition set forth in the Department reports, attached hereto as Exhibit "A" and incorporated herein by this reference.

SECTION 6. ***Indemnification.*** The Applicant shall agree to defend, indemnify, and hold harmless, the City of Ontario or its agents, officers, and employees from any claim, action or proceeding against the City of Ontario or its agents, officers or employees to attack, set aside, void, or annul this approval. The City of Ontario shall promptly notify the applicant of any such claim, action, or proceeding, and the City of Ontario shall cooperate fully in the defense.

SECTION 7. ***Custodian of Records.*** The documents and materials that constitute the record of proceedings on which these findings have been based are located at the City of Ontario City Hall, 303 East "B" Street, Ontario, California 91764. The custodian for these records is the City Clerk of the City of Ontario.

The City Clerk of the City of Ontario shall certify as to the adoption of this Resolution.

PASSED, APPROVED, AND ADOPTED this 19th day of April 2022.

_____
PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO FORM:

_____
BEST BEST & KRIEGER LLP
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. 2022- was duly passed and adopted by the City Council of the City of Ontario at their regular meeting held April 19, 2022, by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

The foregoing is the original of Resolution No. 2022- duly passed and adopted by the Ontario City Council at their regular meeting held April 19, 2022.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

ATTACHMENT A:

Conditions of Approval

(Document follows this page)

CITY OF ONTARIO PLANNING DEPARTMENT

LAND DEVELOPMENT DIVISION CONDITIONS OF APPROVAL

303 East B Street, Ontario, California 91764 Phone: 909.395.2036 / Fax: 909.395.2420

Date Prepared: 1/24/2022

File No: PCUP21-009

Related Files: N/A

Project Description: A Conditional Use Permit (File No. PCUP21-009) to establish and operate a limited-service hotel use on 1.83 acres of land located at 5060 East Fourth Street, within the Freeway Commercial land use district of The Exchange Specific Plan. (APN: 0238-012-30); **submitted by Roger Barbosa.**

Prepared By: Luis E. Batres, Senior Planner
Phone: 909.395.2431 (direct)
Email: Lbatres@ontarioca.gov

The Planning Department, Land Development Section, conditions of approval applicable to the above-described Project, are listed below. The Project shall comply with each condition of approval listed below:

1.0 Standard Conditions of Approval. The project shall comply with the *Standard Conditions for New Development*, adopted by City Council Resolution No. 2017-027 on April 18, 2017. A copy of the *Standard Conditions for New Development* may be obtained from (https://www.ontarioca.gov/Planning/Applications) or from the Planning Department/City Clerk/Records Management Department.

2.0 Special Conditions of Approval. In addition to the *Standard Conditions for New Development* identified in condition no. 1.0, above, the project shall comply with the following special conditions of approval:

2.1 Time Limits. Conditional Use Permit approval shall become null and void one year following the effective date of application approval, unless a building permit is issued and construction is commenced, and diligently pursued toward completion, or a time extension has been approved by the Planning Director, except that a Conditional Use Permit approved in conjunction with a Development Plan shall have the same time limits as said Development Plan. This condition does not supersede any individual time limits specified herein, or any other departmental conditions of approval applicable to the Project, for the performance of specific conditions or improvements.

2.2 General Requirements. The Project shall comply with the following general requirements:

(a) All construction documentation shall be coordinated for consistency, including, but not limited to, architectural, structural, mechanical, electrical, plumbing, landscape

and irrigation, grading, utility and street improvement plans. All such plans shall be consistent with the approved entitlement plans on file with the Planning Department.

(b) The project site shall be developed in conformance with the approved plans on file with the City. Any variation from the approved plans must be reviewed and approved by the Planning Department prior to building permit issuance.

(c) The herein-listed conditions of approval from all City departments shall be included in the construction plan set for project, which shall be maintained on site during project construction.

(d) The project shall provide a total of 118 parking spaces. In the future, if it is determined by the Planning Department as a result of complaints received that additional parking is necessary, the Applicant shall enter into a reciprocal parking agreement with adjacent developments to provide the additional parking (additional 10 parking spaces).

CITY OF ONTARIO
POLICE DEPARTMENT
MEMORANDUM

TO: **Luis Batres, Senior Planner**

FROM: **Officer Savannah Thompson, C.E.T. Unit**

DATE: **March 31, 2022 (Revised)**

SUBJECT: **FILE NO. PCUP21-009 – The Extended Stay Hotel – 5060 E Fourth Street**

The Police Department is placing the following conditions:

This location has **NOT** applied for an alcohol license. The following **alcohol** conditions are only in effect when the representative has the appropriate Alcohol Licensing from the Department of Alcoholic Beverage Control (ABC). **Security conditions apply regardless of the applicant obtaining an alcohol permit.**

ABC Conditions

1. Proprietor to provide an "intent of use statement" as related to the sales of alcoholic beverages.
2. Alcohol sales may occur between 12:00 P.M. to 01:00 A.M., daily, limited to bona fide registered guests.
3. Sales and service of alcohol beverages will only be to guests that are 21 and over and have a bona fide ID.
4. No alcohol sales or service to minors.
5. No sales or service to intoxicated patrons.
6. No alcoholic beverages are to be sold or removed from the establishment for outside consumption.

7. No Smoking inside of establishment is permitted, including electronic nicotine delivery devices.
8. No narcotic sales or usage on the premises at any time.
9. No self-serve alcohol displays allowed.
10. Employees engaged in serving alcohol beverages must be 21 years of age or older.
11. Patrons are not allowed to supply their own alcohol.
12. The service commonly known as "Bottle Service" is prohibited.
13. The applicant shall be responsible for maintaining premises free of graffiti to the premises over which the applicant has control and shall be responsible for its removal within 72 hours of its appearance or upon notice of its appearance to the applicant.
14. No loitering shall be permitted on any property adjacent to the licensed premise, which is under the control of the applicant, and signs must be posted.
15. Applicant, security, and all employees serving alcohol must attend an Alcohol Beverage Control (ABC) L.E.A.D. training class or a certified responsible beverage service class, which has been approved by ABC and Ontario Police Department, within three months of this dated conditional use permit. Proof of re-certification is required every 3 years.
16. Restrooms must be kept free of graffiti.
17. If the banquet hall is utilized, all events will be required to have a signed agreement stating what type of event, estimated amount of people attending, food to be served and type of entertainment. It will also state the amount of security guards that will be needed for this event. The business to apply for a temporary use permit with the Planning Department.

POOL AREA CONDITIONS

1. Alcohol consumption by guests may occur between the hours of 12:00 P.M. to 01:00 A.M., daily in the pool area.
2. Signs will be posted advising no glass containers allowed in the pool area.
3. Alcoholic beverages may only be consumed while a member of staff is monitoring.
4. Alcohol beverages may only be served in the pool area by an employee authorized to serve alcohol beverages.
5. Guests are not allowed to transport alcoholic beverages from the establishment into the pool area or from the pool area into the establishment.

PATIO CONDITIONS

1. Patio walls need to be raised in height to a minimum of 10 feet using Plexiglas or solid block walls, which will allow the sales and consumption of alcohol in the patio area.
2. If the patio height requirements are not met, alcohol may not be served.
3. Patio exits must be gated and always closed. Emergency sounding devices and panic hardware must be installed on gates.
4. Outdoor tables shall not be removed or rearranged to increase occupancy.
5. No sounds emitted to the patio shall be heard outside of the patio area.

SECURITY CONDITIONS

1. Events held in the meeting rooms with the possible attendance of 500 or more, involving live entertainment (ex. dancing, live musicians, concerts) and/ or alcohol beverages will require the applicant to apply for a temporary use permit with the appropriate department.
2. The police department will be given a two-week window, in order to have adequate time to determine how many police officers will be needed to staff an event.
3. A no trespass letter will be on file with the Police Department.
4. All hallways must be kept clear from merchandise, storage, and patrons blocking pathway.
5. No pool tables or arcade/amusement games are permitted inside the establishment.
6. Address to establishment must be illuminated for easy identification of safety personnel.
7. Roof top numbers shall be installed on the flat part of the roof. The numbers shall be a minimum of 3 feet in length and 1 foot in width. Numbers shall be painted, and maintained, in reflective white paint on a flat black background away from roof obstacles. The bottom of the numbers must face the street in which it belongs. The numbers should be maintained every 3 years.
8. The perimeter of business to be fenced with wrought iron and shall be six feet (6) high, open ended, and pickets shall be minimum four (4) inches on center. If block wall fencing is used, it shall be six (6) feet high, with security shrubbery and ant graffiti measures (such as vines) will be used.

9. The ingress and egress of the secured parking lot (defined as any lot intended for overnight guests) to the business shall be controlled by a gate arm.
10. No exterior electrical outlets to be installed on the building.
11. No overnight commercial vehicle parking.
12. Wi-Fi access to only registered guests, must be password protected.
13. Trash enclosures shall be locked and secured at all times, to prevent transients from living in the enclosure, and prevent the pilfering trash/recyclable items. On the days of trash pickup, the enclosure shall be unlocked to facilitate the emptying of the trash receptacles by solid waste hauler and shall once again be locked.
14. Trash enclosures shall be screened by adjacent planters containing a mix of trees, shrubs, and vines.
15. No shrubs/plants higher than three (3) feet and no tree canopy lower than seven (7) feet shall be permitted so as to not obstruct the view of Police Officers on patrol.
16. Plants next to low lying windows shall have thorns as a deterrent for suspects hiding and removing glass panes as a point of entry.
17. Business shall not offer hourly rentals to guests. Room rentals will be increments of 24 hours.
18. The exterior windows on the first floor shall not be utilized as an entry or exit point. Business to ensure proper security measures are in place to prevent such use in accordance with Fire Departments regulations.
19. The establishment is required to have two (2) internal/external security guards to proactively monitor patrons/guests, at all times.
20. In the event security problems occur as a result of the use, the Police Department may request a public hearing before the Zoning Administrator to consider modifications to the security including, but not limited to, the addition of security guards, additional hours for security guards, and replacement of security guards with Ontario Police officers. The public hearing process shall be conducted in accordance with the requirements of the City's Development Code.
21. Ontario Police Officers have the right to limit or reduce the occupancy inside the establishment, if situations arise that may compromise the safety of patrons and the officer. Any additional police resources requested to bring peace in the establishment may be charged to the business owner.

22. Security personnel will be required to follow Ontario Municipal Code Article 6, Title 3, Section 3-1.601-621 (security regulations), which states in part that the security guards used will be registered with the City.
23. A Code of Conduct will be required and posted at all public entrances of the establishment.
24. Graffiti abatement by the business owner/licensee, or management shall be immediate and on-going on the premises, but in no event shall graffiti be allowed unabated on the premises for more than 72 hours. Abatement shall take the form of removal or shall be covered/painted over with a color reasonably matching the color of the existing building, structure, or other surface being abated. Additionally, the business owner/licensee, or management shall notify the City within 24 hours at (909) 395-2626 (graffiti hotline) of any graffiti elsewhere on the property not under the business owner/licensee's or management control so that it may be abated by the property owner and/or the City's graffiti team.
25. The business shall maintain a security camera surveillance system in proper working order. A minimum of one camera will record the patio area, a minimum of one camera will record the pool area, a minimum of one camera will record each parking lot, and a minimum of one camera will record each interior building. Each camera will record at least 640x480 recording resolution levels, and at least fifteen (15) frames per second. The field of view for each camera will be to maximize the coverage of patrons. Recorded video will be stored for a minimum of 30 days and made available to the Police Department upon request.
26. The parking lot lighting must provide adequate lighting from dusk to dawn (minimum one (1) foot candles) and or within the guidelines from the Planning Department.
27. Lighting within the establishment must be kept at a reasonable level as determined by city Planning and Engineering Departments officials.

ROOM SERVICE CONDITIONS

1. Room service alcohol sales may occur between the hours of 12:00 P.M. to 01:00 A.M., daily.

2. Employees engaged in the delivering of alcoholic beverages to rooms, must be 21 years of age.
3. Sales and service of alcohol beverages will only be to room guests that are 21 and over and have a bona fide ID.

Prior to opening, inspection of the premises will be conducted by the Ontario Police Department and the Ontario Planning Department.

The Police Department will conduct a review in six months to determine whether additional conditions are needed.

A copy of the listed conditions of approval must be always posted with your ABC license in a prominent place in the interior of the premises.

Any special event outside the scope of the Conditional Use Permit (CUP) will require a Temporary Use Permit (TUP) which will be processed by the Planning Department and conditioned by the Ontario Police Department. (For example, a radio station promotion held at the hotel, or an outdoor event with alcoholic beverages would be a special event requiring Police or security personnel, but a community service organization breakfast meeting would not be considered a special event and therefore would not require additional security.)

If alcohol related crimes at this location are higher than other similar establishments in the overall City during any quarter, the CUP will automatically be referred to the Zoning Administrator for review and re-conditioning or revocation of the permit. The Police Department may, at their sole discretion, request a revocation hearing if they determine that the establishment is being operated in violation of this CUP or has violated the laws of the State or City.

If you have any questions, please call Officer Savannah Thompson at (909) 408-1125 or Officer Thomas Cho at (909) 408-1671 regarding ABC conditions.

CITY OF ONTARIO *Agenda Report* **April 19, 2022**	**SECTION:** **ADMINISTRATIVE REPORTS/DISCUSSION/ACTION**
Department: Investments & Revenue Resources Prepared By: Cruz Torres Staff Member Presenting: Armen Harkalyan, Executive Director of Finance Reviewed By: Cecilia House, Armen Harkalyan Approved By:	Submitted To: Council/OHA Approved: _____ Continued To: _____ Denied: _____ Item No: 21

SUBJECT: **A RESOLUTION AUTHORIZING THE ISSUANCE OF CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 54 (ESPERANZA FACILITIES) SPECIAL TAX BONDS, SERIES 2022, IN AN AGGREGATE PRINCIPAL AMOUNT NOT TO EXCEED $8 MILLION AND RELATED MATTERS**

RECOMMENDATION: That the City Council consider and adopt a Resolution authorizing the issuance of City of Ontario Community Facilities District No. 54 (Esperanza Facilities) Special Tax Bonds, Series 2022.

A. Authorize the issuance of special tax bonds for public improvements required to facilitate the development of the Esperanza Facilities project and the Ontario Ranch development;
B. Approve the forms of the Indenture, the Bond Purchase Agreement, the Continuing Disclosure Agreement, and the Preliminary Official Statement;
C. Authorize a negotiated sale of the special tax bonds to Stifel, Nicolaus & Company, Incorporated (the "Underwriter") in accordance with the terms of the Bond Purchase Agreement; and
D. Authorize the execution of the Indenture, the Bond Purchase Agreement, the Continuing Disclosure Agreement, a deemed final certification in connection with the Preliminary Official Statement, a final Official Statement and other documents in connection with the issuance of the bonds by the City Manager or the other specified authorized officers.

THE FOLLOWING COUNCIL GOALS ARE BEING ACHIEVED:
Operate in a Businesslike Manner
Focus Resources in Ontario's Commercial and Residential Neighborhoods
Ensure the Development of a Well Planned, Balanced, and Self-Sustaining Community in Ontario Ranch

FISCAL IMPACT: The use of Mello-Roos financing for public facilities in the residential development of the Esperanza Facilities project in the Ontario Ranch development is estimated to generate approximately $8 million, based on current market interest rates, which will be used to help fund a portion of the public infrastructure improvements that will serve the project. The Resolution

authorizing the issuance of City of Ontario Community Facilities District No. 54 (Esperanza Facilities) Special Tax Bonds, Series 2022, and related matters, limits the principal amount of the bonds to $8 million. The City currently expects the bonds to be sold no later than May, 2022; however, such schedule could change based on market volatility and market conditions. Since Mello-Roos bonds are not a direct obligation of the City and are paid from special taxes levied on each taxable parcel in the applicable community facilities district, there is no General Fund impact from the issuance of Mello-Roos bonds. Annual approval by the City Council will be required to process the special tax levies necessary to fund the ongoing debt service obligations of Ontario Community Facilities District No. 54 (Esperanza Facilities).

BACKGROUND & ANALYSIS: The Mello-Roos Community Facilities Act of 1982 provides local government, with the requisite consent and approval from the property owners, the authority to establish community facilities districts for the purpose of levying special taxes to fund governmental services and to finance various kinds of public infrastructure facilities. Under the Mello-Roos Act, the initial steps in the formation of a community facilities district to finance public improvements are adopting a resolution declaring the City's intention to establish a community facilities district and levy special taxes, and a resolution to issue bonds. On April 7, 2020 the City Council, in accordance with the Mello-Roos Act, took the initial steps in the formation of the District with the adoption of Resolution No. 2020-034, declaring the City's intention to establish the District and to authorize the levy of special taxes. On May 19, 2020, the City Council adopted Resolution No. 2020-052 forming the District, and Resolution No. 2020-053 deeming it necessary for the District to incur bonded indebtedness. Based on a successful property owner election held on May 19, 2020, the City Council adopted Ordinance No. 3162 on June 2, 2020, authorizing the levy of special taxes within the District to finance public improvements related to the Esperanza Facilities project. The public improvements to be financed by the District are as follows:

- Street and Traffic Circulation System Facilities

The Esperanza Facilities project addresses the residential development of approximately 26 gross acres located east of Mill Creek Avenue, west of Hamner Avenue, south of Chatham Street, north of Eucalyptus Avenue. At build out, the development is projected to include 226 units; comprised of 100 detached units and 126 attached units.

The proposed Resolution references several bond documents and other matters related to the proposed issuance of bonds by City of Ontario Community Facilities District No. 54 (Esperanza Facilities). The documents are listed below and are on file with the Records Management Department:

- Indenture;
- Bond Purchase Agreement;
- Continuing Disclosure Agreement; and
- Preliminary Official Statement

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ONTARIO, CALIFORNIA, AUTHORIZING THE ISSUANCE OF CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 54 (ESPERANZA FACILITIES) SPECIAL TAX BONDS, SERIES 2022, IN AN AGGREGATE PRINCIPAL AMOUNT OF NOT TO EXCEED $8,000,000, AUTHORIZING THE EXECUTION AND DELIVERY OF AN INDENTURE, A BOND PURCHASE AGREEMENT AND A CONTINUING DISCLOSURE AGREEMENT, AUTHORIZING THE DISTRIBUTION OF AN OFFICIAL STATEMENT IN CONNECTION THEREWITH AND AUTHORIZING THE EXECUTION OF NECESSARY DOCUMENTS AND CERTIFICATES AND RELATED ACTIONS.

WHEREAS, the City Council (the "City Council") of the City of Ontario (the "City") has formed City of Ontario Community Facilities District No. 54 (Esperanza Facilities) (the "Community Facilities District") under the provisions of the Mello-Roos Community Facilities Act of 1982 (the "Act"); and

WHEREAS, the Community Facilities District is authorized under the Act to levy special taxes (the "Special Taxes") to pay for the costs of certain public facilities (the "Facilities") and to issue bonds payable from the Special Taxes; and

WHEREAS, in order to provide funds to finance certain of the Facilities, the Community Facilities District proposes to issue its City of Ontario Community Facilities District No. 54 (Esperanza Facilities) Special Tax Bonds, Series 2022 (the "Series 2022 Bonds"), in the aggregate principal amount of not to exceed $8,000,000; and

WHEREAS, in order to provide for the authentication and delivery of the Series 2022 Bonds, to establish and declare the terms and conditions upon which the Series 2022 Bonds are to be issued and secured and to secure the payment of the principal thereof, premium, if any, and interest thereon, the Community Facilities District proposes to enter into an Indenture with Zions Bancorporation, National Association, as trustee (the "Trustee") (such Indenture, in the form presented to this meeting, with such changes, insertions and omissions as are made pursuant to this Resolution, being referred to herein as the "Indenture"); and

WHEREAS, Stifel, Nicolaus & Company, Incorporated (the "Underwriter"), has presented the Community Facilities District with a proposal, in the form of a Bond Purchase Agreement, to purchase the Series 2022 Bonds from the Community Facilities District (such Bond Purchase Agreement, in the form presented to this meeting, with such changes, insertions and omissions as are made pursuant to this Resolution, being referred to herein as the "Purchase Agreement"); and

WHEREAS, Rule 15c2-12 promulgated under the Securities Exchange Act of 1934 ("Rule 15c2-12") requires that, in order to be able to purchase or sell the Series 2022 Bonds, the underwriter thereof must have reasonably determined that the Community Facilities District has, or one or more appropriate obligated persons have, undertaken in a written

agreement or contract for the benefit of the holders of the Series 2022 Bonds to provide disclosure of certain financial information and certain listed events on an ongoing basis; and

WHEREAS, in order to cause such requirement to be satisfied, the Community Facilities District desires to enter into a Continuing Disclosure Agreement with the Trustee (such Continuing Disclosure Agreement, in the form presented to this meeting, with such changes, insertions and omissions as are made pursuant to this Resolution, being referred to herein as the "Continuing Disclosure Agreement"); and

WHEREAS, a form of the Preliminary Official Statement to be distributed in connection with the public offering of the Series 2022 Bonds has been prepared (such Preliminary Official Statement, in the form presented to this meeting, with such changes, insertions and omissions as are made pursuant to this Resolution, being referred to herein as the "Preliminary Official Statement"); and

WHEREAS, there have been prepared and submitted to this meeting forms of:

(a) the Indenture;
(b) the Purchase Agreement;
(c) the Continuing Disclosure Agreement; and
(d) the Preliminary Official Statement;

WHEREAS, Kitty Siino & Associates, Inc. has prepared and provided to the Community Facilities District an appraisal report, dated March 23, 2022 (the "Appraisal"), providing an opinion of value of the property in the Community Facilities District, which has been submitted to this meeting; and

WHEREAS, Section 5852.1 of the California Government Code requires that the City Council obtain from an underwriter, financial advisor or private lender and disclose, in a meeting open to the public, prior to authorization of the issuance of the Series 2022 Bonds, good faith estimates of (a) the true interest cost of the Series 2022 Bonds, (b) the sum of all fees and charges paid to third parties with respect to the Series 2022 Bonds, (c) the amount of proceeds of the Series 2022 Bonds expected to be received net of the fees and charges paid to third parties and any reserves or capitalized interest paid or funded with proceeds of the Series 2022 Bonds, and (d) the sum total of all debt service payments on the Series 2022 Bonds calculated to the final maturity of the Series 2022 Bonds plus the fees and charges paid to third parties not paid with the proceeds of the Series 2022 Bonds; and

WHEREAS, in compliance with Section 5852.1 of the California Government Code, the City Council has obtained from CSG Advisors Incorporated, as the Community Facilities District's Municipal Advisor, the required good faith estimates, which the Municipal Advisor has prepared in consultation with the Underwriter, and such estimates are disclosed and set forth in Exhibit A attached hereto; and

WHEREAS, the Community Facilities District desires to proceed to issue and sell the Series 2022 Bonds and to authorize the execution of such documents and the performance of such acts as may be necessary or desirable to effect the offering, sale and issuance of the Series 2022 Bonds; and

WHEREAS, the City Council is the legislative body of the Community Facilities District.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Ontario as follows:

SECTION 1. The foregoing recitals are true and correct.

SECTION 2. Subject to the provisions of Section 3 hereof, the issuance of the Series 2022 Bonds, in an aggregate principal amount of not to exceed $8,000,000, on the terms and conditions set forth in, and subject to the limitations specified in, the Indenture, be and the same is hereby authorized and approved. The Series 2022 Bonds shall be dated, shall bear interest at the rates, shall mature on the dates, shall be subject to call and redemption, shall be issued in the form and shall be as otherwise provided in the Indenture, as the same shall be completed as provided in this Resolution.

SECTION 3. The Indenture, in substantially the form submitted to this meeting and made a part hereof as though set forth herein, be and the same is hereby approved. Each of the Mayor of the City, and such other member of the City Council as the Mayor may designate, the City Manager of the City, the Assistant City Manager of the City, the Executive Director of Finance of the City, the Deputy City Treasurer of the City, and such other officer or employee of the City as the City Manager may designate (the "Authorized Officers") is hereby authorized, and any one of the Authorized Officers is hereby directed, for and in the name of the Community Facilities District, to execute and deliver the Indenture in the form submitted to this meeting, with such changes, insertions and omissions as the Authorized Officer executing the same may require or approve, such requirement or approval to be conclusively evidenced by the execution of the Indenture by such Authorized Officer; provided, however, that such changes, insertions and omissions shall not authorize an aggregate principal amount of Series 2022 Bonds in excess of $8,000,000, shall not result in a final maturity date of the Series 2022 Bonds later than September 1, 2053, and shall not result in a true interest cost for the Series 2022 Bonds in excess of 6.50%.

SECTION 4. The Purchase Agreement, in substantially the form submitted to this meeting and made a part hereof as though set forth in full herein, be and the same is hereby approved. Each of the Authorized Officers is hereby authorized, and any one of the Authorized Officers is hereby directed, for and in the name of the Community Facilities District, to execute and deliver the Purchase Agreement in the form presented to this meeting, with such changes, insertions and omissions as the Authorized Officer executing the same may require or approve, such requirement or approval to be conclusively evidenced by the execution of the Purchase Agreement by such Authorized Officer; provided, however, that such changes, insertions and omissions shall not result in an aggregate underwriter's discount (not including any original issue discount) from the principal amount of the Series 2022 Bonds in excess of 2.00% of the aggregate principal amount of the Series 2022 Bonds. The City Council hereby finds and determines that the sale of the Series 2022 Bonds at negotiated sale as contemplated by the Purchase Agreement will result in a lower overall cost.

SECTION 5. The Continuing Disclosure Agreement, in substantially the form submitted to this meeting and made a part hereof as though set forth in full herein, be and the same is hereby approved. Each of the Authorized Officers is hereby authorized, and any one of the Authorized Officers is hereby directed, for and in the name of the Community Facilities District, to execute and deliver the Continuing Disclosure Agreement in the form presented to this meeting, with such changes, insertions and omissions as the Authorized Officer executing the same may require or approve, such requirement or approval to be conclusively evidenced by the execution of the Continuing Disclosure Agreement by such Authorized Officer.

SECTION 6. The Preliminary Official Statement, in substantially the form presented to this meeting and made a part hereof as though set forth in full herein, with such changes, insertions and omissions therein as may be approved by an Authorized Officer, be and the same is hereby approved, and the use of the Preliminary Official Statement in connection with the offering and sale of the Series 2022 Bonds is hereby authorized and approved. Each of the Authorized Officers is hereby authorized, and any one of the Authorized Officers is hereby directed, to certify on behalf of the Community Facilities District that the Preliminary Official Statement is deemed final as of its date, within the meaning of Rule 15c2-12 (except for the omission of certain final pricing, rating and related information as permitted by Rule 15c2-12).

SECTION 7. The preparation and delivery of a final Official Statement (the "Official Statement"), and its use in connection with the offering and sale of the Series 2022 Bonds, be and the same is hereby authorized and approved. The Official Statement shall be in substantially the form of the Preliminary Official Statement, with such changes, insertions and omissions as may be approved by an Authorized Officer, such approval to be conclusively evidenced by the execution and delivery thereof. Each of the Authorized Officers is hereby authorized, and any one of the Authorized Officers is hereby directed, for and in the name of the Community Facilities District, to execute the final Official Statement and any amendment or supplement thereto.

SECTION 8. Based upon the property values within the Community Facilities District reported in the Appraisal and the value-to-lien information set forth in the Preliminary Official Statement, the City Council, for purposes of Section 53345.8 of the Act, hereby finds and determines that the value of the real property that would be subject to the Special Tax to pay debt service on the Series 2022 Bonds will be at least three times the principal amount of the Series 2022 Bonds to be sold and the principal amount of all other bonds outstanding that are secured by a special tax levied pursuant to the Act on property within the Community Facilities District or a special assessment levied on property within the Community Facilities District.

SECTION 9. If and to the extent that any feature or aspect of the Series 2022 Bond structure, the rate and method of apportionment of the Special Taxes, the method of financing the Facilities, the appraisal, the absorption study or other components of the Series 2022 Bond issue approved and authorized hereby is inconsistent or in conflict with any requirement, standard, measure or procedure set forth in the City's Mello-Roos Community Facilities Act of 1982 Local Goals and Policies, such requirement, standard, measure or procedure is, to the extent necessary to eliminate such inconsistency or conflict, hereby

waived, and the City Council hereby finds and determines that benefit inures to the ultimate property owners, the Community Facilities District and the City as a result of such waiver.

SECTION 10. The City Council hereby approves the execution and delivery of all agreements, documents, certificates and instruments referred to herein with electronic signatures as may be permitted under the California Uniform Electronic Transactions Act and digital signatures as may be permitted under Section 16.5 of the California Government Code using DocuSign.

SECTION 11. All actions heretofore taken by the officers, employees and agents of the City with respect to the issuance and sale of the Series 2022 Bonds, or in connection with or related to any of the agreements or documents referred to herein, are hereby approved, confirmed and ratified.

SECTION 12. The officers, employees and agents of the City are hereby authorized and directed to take all actions and do all things which they, or any of them, may deem necessary or desirable to accomplish the purposes of this Resolution and not inconsistent with the provisions hereof.

SECTION 13. This Resolution shall take effect immediately upon its adoption.

The City Clerk of the City of Ontario shall certify as to the adoption of this Resolution.

PASSED, APPROVED, AND ADOPTED this 19th day of April 2022.

_____
PAUL S. LEON, MAYOR

ATTEST:

_____
SHEILA MAUTZ, CITY CLERK

APPROVED AS TO FORM:

_____
BEST BEST & KRIEGER, LLP
CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO)
CITY OF ONTARIO)

I, SHEILA MAUTZ, City Clerk of the City of Ontario, DO HEREBY CERTIFY that foregoing Resolution No. 2022- was duly passed and adopted by the City Council of the City of Ontario at their regular meeting held April 19, 2022 by the following roll call vote, to wit:

AYES: COUNCIL MEMBERS:

NOES: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

The foregoing is the original of Resolution No. 2022- duly passed and adopted by the Ontario City Council at their regular meeting held April 19, 2022.

_____
SHEILA MAUTZ, CITY CLERK

(SEAL)

EXHIBIT A

GOOD FAITH ESTIMATES

The good faith estimates set forth herein are provided with respect to the Series 2022 Bonds in accordance with Section 5852.1 of the California Government Code. Such good faith estimates have been provided to the Community Facilities District by CSG Advisors Incorporated, the Community Facilities District's municipal advisor (the "Municipal Advisor"), which the Municipal Advisor has prepared in consultation with Stifel, Nicolaus & Company, Incorporated, the Underwriter.

Principal Amount. The Municipal Advisor has informed the Community Facilities District that, based on the Community Facilities District's financing plan and current market conditions, its good faith estimate of the aggregate principal amount of the Series 2022 Bonds to be issued and sold is $6,110,000 (the "Estimated Principal Amount"), which does not include approximately $369,000 of net premium estimated to be generated based on current market conditions. Net premium is generated when, on a net aggregate basis for a single issuance of bonds, the price paid for such bonds is higher than the face value of such bonds. Such Estimated Principal Amount and such estimated net premium amount would produce approximately $6,479,000 of gross proceeds.

True Interest Cost of the Series 2022 Bonds. The Municipal Advisor has informed the Community Facilities District that, assuming that the Estimated Principal Amount of the Series 2022 Bonds is issued and sold, and based on market interest rates prevailing at the time of preparation of such estimate, its good faith estimate of the true interest cost of the Series 2022 Bonds, which means the rate necessary to discount the amounts payable on the respective principal and interest payment dates to the purchase price received for the Series 2022 Bonds, is 4.22%.

Finance Charge of the Series 2022 Bonds. The Municipal Advisor has informed the Community Facilities District that, assuming that the Estimated Principal Amount of the Series 2022 Bonds is issued and sold, and based on market interest rates prevailing at the time of preparation of such estimate, its good faith estimate of the finance charge for the Series 2022 Bonds, which means the sum of all fees and charges paid to third parties (or costs associated with the Series 2022 Bonds), is $341,000.

Amount of Proceeds to be Received. The Municipal Advisor has informed the Community Facilities District that, assuming that the Estimated Principal Amount of the Series 2022 Bonds is issued and sold, and based on market interest rates prevailing at the time of preparation of such estimate, its good faith estimate of the amount of proceeds expected to be received by the Community Facilities District for sale of the Series 2022 Bonds, less the finance charge of the Series 2022 Bonds, as estimated above, and any reserves or capitalized interest paid or funded with proceeds of the Series 2022 Bonds, is $5,756,000.

Total Payment Amount. The Municipal Advisor has informed the Community Facilities District that, assuming that the Estimated Principal Amount of the Series 2022 Bonds is sold, and based on market interest rates prevailing at the time of preparation of such estimate, its good faith estimate of the total payment amount, which means the sum

total of all payments the Community Facilities District will make to pay debt service on the Series 2022 Bonds, plus the finance charge for the Series 2022 Bonds, as described above, not paid with the proceeds of the Series 2022 Bonds, calculated to the final maturity of the Series 2022 Bonds, is $11,456,000, which excludes any reserves or capitalized interest funded or paid with proceeds of the Series 2022 Bonds (which may offset such total payment amount).

The foregoing estimates constitute good faith estimates only and are based on market conditions prevailing at the time of preparation of such estimates. The actual principal amount of the Series 2022 Bonds issued and sold, the true interest cost thereof, the finance charges thereof, the amount of proceeds received therefrom and total payment amount with respect thereto may differ from such good faith estimates due to (a) the actual date of the sale of the Series 2022 Bonds being different than the date assumed for purposes of such estimates, (b) the actual principal amount of Series 2022 Bonds issued and sold being different from the Estimated Principal Amount, (c) the actual amortization of the Series 2022 Bonds being different than the amortization assumed for purposes of such estimates, (d) the actual market interest rates at the time of sale of the Series 2022 Bonds being different than those estimated for purposes of such estimates, (e) other market conditions, or (f) alterations in the Community Facilities District's financing plan, or a combination of such factors. The actual date of sale of the Series 2022 Bonds and the actual principal amount of Series 2022 Bonds issued and sold will be determined by the Community Facilities District based on the timing of the need for proceeds of the Series 2022 Bonds and other factors. The actual interest rates borne by the Series 2022 Bonds will depend on market interest rates at the time of sale thereof. The actual amortization of the Series 2022 Bonds will also depend, in part, on market interest rates at the time of sale thereof. Market interest rates are affected by economic and other factors beyond the control of the Community Facilities District.

INDENTURE

by and between

CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 54
(ESPERANZA FACILITIES)

and

ZIONS BANCORPORATION, NATIONAL ASSOCIATION,
AS TRUSTEE

Dated as of _____ 1, 2022

Relating to
City of Ontario
Community Facilities District No. 54
(Esperanza Facilities)
Special Tax Bonds

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INDENTURE

THIS INDENTURE (this "Indenture"), dated as of _____ 1, 2022, is by and between CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 54 (Esperanza FACILITIES), a community facilities district organized and existing under the laws of the State of California (the "Community Facilities District"), and ZIONS BANCORPORATION, NATIONAL ASSOCIATION, a national banking association organized and existing under the laws of the United States of America, as trustee (the "Trustee").

W I T N E S S E T H:

WHEREAS, the City Council of the City of Ontario has formed the Community Facilities District under the provisions of the Mello-Roos Community Facilities Act of 1982 (the "Act");

WHEREAS, the Community Facilities District is authorized under the Act to levy special taxes (the "Special Taxes") to pay for the costs of certain public facilities (the "Facilities") and to issue bonds payable from the Special Taxes;

WHEREAS, in order to provide funds to finance a portion of the Facilities, the Community Facilities District desires to provide for the issuance of its City of Ontario Community Facilities District No. 54 (Esperanza Facilities) Special Tax Bonds, Series 2022 (the "Series 2022 Bonds"), in the aggregate principal amount of not to exceed $_____;

WHEREAS, the Community Facilities District desires to provide for the issuance of additional bonds (the "Additional Bonds") for refunding purposes payable from the Special Taxes on a parity with the Series 2022 Bonds, provided that said issuance is in accordance with the Act and this Indenture (the Series 2022 Bonds and any such Additional Bonds being collectively referred to as the "Bonds");

WHEREAS, in order to provide for the authentication and delivery of the Bonds, to establish and declare the terms and conditions upon which the Bonds are to be issued and secured and to secure the payment of the principal thereof, premium, if any, and interest thereon, the Community Facilities District has authorized the execution and delivery of this Indenture; and

WHEREAS, the Community Facilities District has determined that all acts and proceedings required by law necessary to make the Bonds, when executed by the Community Facilities District, authenticated and delivered by the Trustee and duly issued, the valid, binding and legal special obligations of the Community Facilities District, and to constitute this Indenture a valid and binding agreement for the uses and purposes herein set forth in accordance with its terms, have been done and taken, and the execution and delivery of this Indenture has been in all respects duly authorized;

NOW, THEREFORE, THIS INDENTURE WITNESSETH, that in order to secure the payment of the principal of, premium, if any, and the interest on all Bonds at any time issued and outstanding under this Indenture, according to their tenor, and to secure the performance and observance of all the covenants and conditions therein and herein set forth, and to declare the terms and conditions upon and subject to which the Bonds are to be issued, and in consideration of the premises and of the mutual covenants herein contained and of the purchase and acceptance of the Bonds by the owners thereof, and for other valuable consideration, the receipt whereof is hereby

acknowledged, the Community Facilities District does hereby covenant and agree with the Trustee, for the benefit of the respective owners from time to time of the Bonds, as follows:

ARTICLE I

DEFINITIONS; RULES OF CONSTRUCTION; EQUAL SECURITY

Section 1.01. Definitions. Unless the context otherwise requires, the terms defined in this Section shall for all purposes of this Indenture and of any certificate, opinion or other document herein or therein mentioned, have the meanings herein specified.

"Act" means the Mello-Roos Community Facilities Act of 1982, constituting Sections 53311 *et seq.* of the California Government Code.

"Additional Bonds" means Bonds other than Series 2022 Bonds issued hereunder in accordance with the provisions of Sections 3.05 and 3.06.

"Administrative Expense Fund" means the fund by that name established and held by the Trustee pursuant to Section 5.07.

"Administrative Expenses" means any reasonably necessary or appropriate expenses incurred in the administration of the Community Facilities District and the Bonds, including (a) the administrative and legal costs of levying and collecting the Special Taxes (including costs incurred in connection with any appeals relating thereto and litigation expenses incurred in connection with the collection of such Special Taxes), (b) the fees, costs and indemnifications due the Trustee, (c) the costs incurred with on-going disclosure in connection with the Bonds, (d) the costs incurred in connection with the disclosure of the Special Taxes to property owners and potential purchasers of property, (e) the amounts required to calculate and pay arbitrage rebate payments to the federal government, and (f) an allocable share of the salaries of the City staff providing services on behalf of the Community Facilities District directly related to the foregoing and an allocable share of City general administrative overhead related thereto.

"Annual Debt Service" means, for each Bond Year, the sum of (a) the interest due on the Outstanding Bonds in such Bond Year, assuming that the Outstanding Bonds are retired as scheduled (including by reason of mandatory sinking fund redemptions), and (b) the principal of the Outstanding Bonds due in such Bond Year (including by reason of mandatory sinking fund redemptions).

"Authorized Denominations" means (a) with respect to the Series 2022 Bonds, $5,000 and any integral multiple thereof, and (b) with respect to each Series of Additional Bonds, the authorized denominations for such Series of Additional Bonds specified in the Supplemental Indenture pursuant to which such Additional Bonds are issued.

"Authorized Representative" means, with respect to the Community Facilities District, the Mayor of the City, the City Manager of the City, the Assistant City Manager of the City, the Executive Director of Finance of the City and the Deputy City Treasurer of the City, and any other Person designated as an Authorized Representative of the Community Facilities District in a Written Certificate of the Community Facilities District filed with the Trustee.

"Average Annual Debt Service" means the average of the Annual Debt Service for all Bond Years, including the Bond Year in which the calculation is made.

"Beneficial Owners" means those Persons for which the Participants have caused the Depository to hold Book-Entry Bonds.

"Bond Counsel" means a firm of nationally recognized bond counsel selected by the Community Facilities District.

"Bond Fund" means the fund by that name established and held by the Trustee pursuant to Section 5.03.

"Bond Year" means the twelve-month period beginning on September 2 in each year and extending to the next succeeding September 1, both dates inclusive, except that the first Bond Year shall begin on the Closing Date and end on September 1, 2022.

"Bonds" means the City of Ontario Community Facilities District No. 54 (Esperanza Facilities) Special Tax Bonds issued hereunder, and includes the Series 2022 Bonds and any Additional Bonds.

"Book-Entry Bonds" means the Bonds of a Series registered in the name of the Depository, or the Nominee thereof, as the registered owner thereof pursuant to the terms and provisions of Section 2.07.

"Business Day" means a day which is not (a) a Saturday, Sunday or legal holiday in the State, (b) a day on which banking institutions in the State, or in any state in which the Office of the Trustee is located, are required or authorized by law (including executive order) to close, or (c) a day on which the New York Stock Exchange is closed.

"Cede & Co." means Cede & Co., the nominee of DTC, and any successor nominee of DTC with respect to a Series of Book-Entry Bonds.

"Circulation System Facility" has the meaning ascribed to the term "Circulation System Segment" in the NMC Acquisition Agreement.

"City" means the City of Ontario, a general law city organized and existing under and by virtue of the laws of the State of California, and any successor thereto.

"City Council" means the City Council of the City.

"City Facilities Account" means the account by that name within the Improvement Fund established and held by the Trustee pursuant to Section 3.04.

"Closing Date" means the date upon which the Series 2022 Bonds are delivered to the Original Purchaser, being _____, 2022.

"Code" means the Internal Revenue Code of 1986.

"Community Facilities District" means City of Ontario Community Facilities District No. 54 (Esperanza Facilities), a community facilities district organized and existing under the laws of the State, and any successor thereto.

"Continuing Disclosure Agreement" means the Continuing Disclosure Agreement, dated as of _____ 1, 2022, by and between the Community Facilities District and Zions Bancorporation, National Association, as Trustee, as originally executed and as it may be amended, supplemented or otherwise modified from time to time in accordance with the terms thereof.

"Corresponding Bond Year" means, with respect to any Fiscal Year, the Bond Year that commences in such Fiscal Year.

"Costs of Issuance" means all items of expense directly or indirectly payable by or reimbursable to the Community Facilities District relating to the authorization, issuance, sale and delivery of the Bonds, including but not limited to printing expenses, rating agency fees, filing and recording fees, initial fees, expenses and charges of the Trustee and its counsel, including the Trustee's first annual administrative fee, fees, charges and disbursements of attorneys, municipal advisors, accounting firms, consultants and other professionals, fees and charges for preparation, execution and safekeeping of the Bonds, any premium for a bond insurance policy securing payment of the Bonds, any premium for a reserve facility and any other cost, charge or fee in connection with the original issuance of the Bonds.

"Costs of Issuance Fund" means the fund by that name established and held by the Trustee pursuant to Section 3.03.

"County" means the County of San Bernardino, a county and political subdivision of the State organized and existing under the laws of the State, and any successor thereto.

"County Assessor" means the assessor of the County.

"County Auditor" means the auditor of the County.

"Defeasance Securities" means (a) non-callable direct obligations of the United States of America ("United States Treasury Obligations"), and (b) evidences of ownership of proportionate interests in future interest and principal payments on United States Treasury Obligations held by a bank or trust company as custodian, under which the owner of the investment is the real party in interest and has the right to proceed directly and individually against the obligor and the underlying United States Treasury Obligations are not available to any person claiming through the custodian or to whom the custodian may be obligated.

"Depository" means DTC, and its successors as securities depository for any Series of Book-Entry Bonds, including any such successor appointed pursuant to Section 2.07.

"DTC" means The Depository Trust Company, a limited-purpose trust company organized under the laws of the State of New York.

"Electronic Means" means e-mail, facsimile transmission, secure electronic transmission containing applicable authorization codes, passwords and/or authentication keys issued by the Trustee, or another method or system specified by the Trustee as available for use in connection with its services hereunder.

"Event of Default" means any event specified in Section 7.01.

"Facilities" means the facilities authorized to be financed by the Community Facilities District, as more particularly described in the Resolution of Formation.

"Fiscal Year" means the period beginning on July 1 of each year and ending on the next succeeding June 30, or any other twelve-month period hereafter selected and designated as the official fiscal year period of the Community Facilities District.

"GDC/CDG Esperanza" means GDC/CDG Esperanza PA 4 Venture, L.P., a limited partnership organized and existing under the laws of the State of Delaware, and any successor thereto.

"GDC/CDG Esperanza Acquisition Account" means the account by that name within the Improvement Fund established and held by the Trustee pursuant to Section 3.04.

"GDC/CDG Esperanza Acquisition Agreement" means the Acquisition and Funding Agreement, dated as of May 1, 2020, by and between the City and GDC/CDG Esperanza, as originally executed and as it may be amended, supplemented or otherwise modified from time to time in accordance with the terms thereof.

"GDC/CDG Esperanza Facilities" has the meaning ascribed to the term "Facilities" in the GDC/CDG Esperanza Acquisition Agreement.

"GDC/CDG Esperanza Payment Request" has the meaning ascribed to the term "Payment Request" in the GDC/CDG Esperanza Acquisition Agreement.

"Improvement Fund" means the fund by that name established and held by the Trustee pursuant to Section 3.04.

"Indenture" means this Indenture, dated as of _____ 1, 2022, by and between the Community Facilities District and Zions Bancorporation, National Association, as Trustee, as originally executed and as it may be modified or amended from time to time by any Supplemental Indenture.

"Independent Consultant" means any consultant or firm of such consultants selected by the Community Facilities District and who, or each of whom (a) is generally recognized to be qualified in the financial consulting field, (b) is in fact independent and not under the control of the Community Facilities District or the City, (c) does not have any substantial interest, direct or indirect, with or in the Community Facilities District or the City, with or in any owner of real property in the Community Facilities District, or in any real property in the Community Facilities District, and (d) is not connected with the Community Facilities District or the City as an officer or employee thereof, but who may be regularly retained to make reports to the Community Facilities District or the City.

"Interest Account" means the account by that name within the Bond Fund established and held by the Trustee pursuant to Section 5.03.

"Interest Payment Dates" means March 1 and September 1 of each year, commencing September 1, 2022.

"Letter of Representations" means the Letter of Representations from the Community Facilities District to the Depository, in which the Community Facilities District makes certain representations with respect to issues of its securities for deposit by the Depository.

"Maximum Annual Debt Service" means the largest Annual Debt Service for any Bond Year, including the Bond Year in which the calculation is made.

"Moody's" means Moody's Investors Service, Inc., a corporation duly organized and existing under the laws of the State of Delaware, and its successors and assigns, except that if such entity shall be dissolved or liquidated or shall no longer perform the functions of a securities rating agency, then the term "Moody's" shall be deemed to refer to any other nationally recognized securities rating agency selected by the Community Facilities District.

"Net Special Tax Revenues" means Special Tax Revenues, less amounts required to pay Administrative Expenses.

"NMC Acquisition Account" means the account by that name within the Improvement Fund established and held by the Trustee pursuant to Section 3.04.

"NMC Acquisition Agreement" means the Acquisition and Funding Agreement, dated as of July 21, 2015, by and between the City and NMC Builders, as originally executed and as it may be amended, supplemented or otherwise modified from time to time in accordance with the terms thereof.

"NMC Builders" means NMC Builders, LLC, a limited liability company organized and existing under the laws of the State of California, and any successor thereto.

"NMC Facilities" has the meaning ascribed to the term "Facilities" in the NMC Acquisition Agreement.

"NMC Payment Request" has the meaning ascribed to the term "Payment Request" in the NMC Acquisition Agreement.

"Nominee" means the nominee of the Depository, which may be the Depository, as determined from time to time pursuant to Section 2.07.

"Office of the Trustee" means the principal corporate trust office of the Trustee in Los Angeles, California, or such other office as may be specified to the Community Facilities District by the Trustee in writing; provided, however, that with respect to presentation of Bonds for payment or for registration of transfer and exchange, such term shall mean the office or agency of the Trustee at which, at any particular time, its corporate trust agency business shall be conducted, which other office or agency shall be specified to the Community Facilities District by the Trustee in writing.

"Ordinance" means any ordinance adopted by the City Council levying the Special Taxes.

"Original Purchaser" means the original purchaser of the Series 2022 Bonds from the Community Facilities District.

"Outstanding" means, when used as of any particular time with reference to Bonds, subject to the provisions of Section 11.07, all Bonds theretofore, or thereupon being, authenticated and delivered by the Trustee under this Indenture except (a) Bonds theretofore canceled by the Trustee or surrendered to the Trustee for cancellation, (b) Bonds with respect to which all liability of the Community Facilities District shall have been discharged in accordance with Section 10.01, and (c) Bonds in lieu of which other Bonds shall have been authenticated and delivered by the Trustee, or that have been paid without surrender thereof, pursuant to Section 2.08.

"Owner" means, with respect to a Bond, the Person in whose name such Bond is registered on the Registration Books.

"Participant" means any entity which is recognized as a participant by DTC in the book-entry system of maintaining records with respect to Book-Entry Bonds.

"Participating Underwriter" has the meaning ascribed to such term in the Continuing Disclosure Agreement.

"Permitted Investments" is defined in Exhibit A hereto.

"Person" means an individual, corporation, limited liability company, firm, association, partnership, trust or other legal entity or group of entities, including a governmental entity or any agency or political subdivision thereof.

"Principal Account" means the account by that name within the Bond Fund established and held by the Trustee pursuant to Section 5.03.

"Rate and Method" means the rate and method of apportionment of the Special Taxes approved by the qualified electors of the Community Facilities District.

"Rebate Fund" means the fund by that name established and held by the Trustee pursuant to Section 5.06.

"Rebate Requirement" has the meaning ascribed to such term in the Tax Certificate.

"Record Date" means, with respect to interest payable on any Interest Payment Date, the 15th calendar day of the month preceding such Interest Payment Date, whether or not such day is a Business Day.

"Redemption Fund" means the fund by that name established and held by the Trustee pursuant to Section 5.05.

"Redemption Price" means the aggregate amount of principal of and premium, if any, on the Bonds upon the redemption thereof pursuant hereto.

"Registration Books" means the records maintained by the Trustee for the registration of ownership and registration of transfer of the Bonds pursuant to Section 2.05.

"Reserve Fund" means the fund by that name established and held by the Trustee pursuant to Section 5.04.

"Reserve Requirement" means, as of the date of any calculation, the least of (a) "10% of the proceeds of the issue," within the meaning of Section 148 of the Code, with respect to the Bonds (excluding from such calculation Bonds refunded with the proceeds of subsequently issued Bonds), (b) Maximum Annual Debt Service, and (c) 125% of Average Annual Debt Service.

"Resolution of Formation" means Resolution No. 2020-052, adopted by the City Council on May 19, 2020, as originally adopted and as it may be amended, supplemented or otherwise modified from time to time.

"S&P" means S&P Global Ratings, a business unit of Standard and Poor's Financial Services, LLC, and its successors and assigns, except that if such entity shall be dissolved or liquidated or shall no longer perform the functions of a securities rating agency, then the term "S&P" shall be deemed to refer to any other nationally recognized securities rating agency selected by the Community Facilities District.

"Series" means the initial series of Bonds executed, authenticated and delivered on the date of initial issuance of the Bonds and identified pursuant to this Indenture as the Series 2022 Bonds, and any Additional Bonds issued pursuant to a Supplemental Indenture and identified as a separate Series of Bonds.

"Series 2022 Bonds" means the City of Ontario Community Facilities District No. 54 (Esperanza Facilities) Special Tax Bonds, Series 2022, issued hereunder.

"Services" has the meaning ascribed to such term in the Rate and Method.

"Special Tax Fund" means the fund by that name established and held by the Trustee pursuant to Section 5.02.

"Special Tax Revenues" means the proceeds of the Special Taxes received by or on behalf of the Community Facilities District, other than proceeds of Special Taxes levied to pay the costs of Services received by or on behalf of the Community Facilities District, including any prepayments thereof, interest and penalties thereon and proceeds of the redemption or sale of property sold as a result of foreclosure of the lien of the Special Taxes, which shall be limited to the amount of said lien and interest and penalties thereon.

"Special Taxes" means the special taxes approved by the qualified electors to be levied within the Community Facilities District pursuant to the Act and the Rate and Method.

"State" means the State of California.

"Supplemental Indenture" means any supplemental indenture modifying or amending this Indenture, but only if and to the extent that such Supplemental Indenture is specifically authorized hereunder.

"Tax Certificate" means the Tax Certificate executed by the Community Facilities District at the time of issuance of the Series 2022 Bonds relating to the requirements of Section 148 of the Code, as originally executed and as it may be amended, supplemented or otherwise modified from time to time in accordance with the terms thereof.

"Trustee" means Zions Bancorporation, National Association, a national banking association organized and existing under the laws of the United States of America, or any successor thereto as Trustee hereunder substituted in its place as provided herein.

"Verification Report" means, with respect to the deemed payment of Bonds pursuant to clause (ii) of Section 10.02(a), a report of a nationally recognized certified public accountant, or firm of such accountants, verifying that the Defeasance Securities and cash, if any, deposited in connection with such deemed payment satisfy the requirements of clause (ii) of Section 10.02(a).

"Written Certificate" and **"Written Request"** of the Community Facilities District mean, respectively, a written certificate or written request signed in the name of the Community Facilities District by an Authorized Representative. Any such certificate or request may, but need not, be combined in a single instrument with any other instrument, opinion or representation, and the two or more so combined shall be read and construed as a single instrument.

Section 1.02. Rules of Construction. (a) The terms defined herein expressed in the singular shall, unless the context otherwise indicates, include the plural and vice versa.

(b) The use herein of the masculine, feminine or neuter gender is for convenience only and shall be deemed and construed to include correlative words of the masculine, feminine or neuter gender, as appropriate.

(c) References herein to a document shall include all amendments, supplements or other modifications to such document, and any replacements, substitutions or novation of, that document.

(d) Any term defined herein by reference to another document shall continue to have the meaning ascribed thereto whether or not such other document remains in effect.

(e) The use herein of the words "including" and "includes," and words of similar import, shall be deemed to be followed by the phrase "without limitation."

(f) Headings of Articles and Sections herein and the table of contents hereof are solely for convenience of reference, do not constitute a part hereof and shall not affect the meaning, construction or effect hereof.

(g) All references herein to designated "Articles," "Sections," "Exhibits," "subsections," "paragraphs," "clauses," and other subdivisions are to the designated Articles, Sections, Exhibits, subsections, paragraphs, clauses, and other subdivisions of this Indenture.

(h) The words "hereof" (except when preceded by a specific Section or Article reference) "herein," "hereby," "hereunder," "hereinabove," "hereinafter," and other equivalent

words and phrases used herein refer to this Indenture and not solely to the particular portion hereof in which any such word is used.

Section 1.03. Equal Security. In consideration of the acceptance of the Bonds by the Owners thereof, this Indenture shall be deemed to be and shall constitute a contract among the Community Facilities District, the Trustee and the Owners from time to time of all Bonds authorized, executed, issued and delivered hereunder and then Outstanding to secure the full and final payment of the principal of, premium, if any, and interest on all Bonds which may from time to time be authorized, executed, issued and delivered hereunder, subject to the agreements, conditions, covenants and provisions contained herein; and all agreements and covenants set forth herein to be performed by or on behalf of the Community Facilities District shall be for the equal and proportionate benefit, protection and security of all Owners of the Bonds without distinction, preference or priority as to security or otherwise of any Bonds over any other Bonds by reason of the number or date thereof or the time of authorization, sale, execution, issuance or delivery thereof or for any cause whatsoever, except as expressly provided herein or therein.

ARTICLE II

THE BONDS

Section 2.01. Authorization of Bonds; Special Obligations. (a) The Community Facilities District hereby authorizes the issuance of the Bonds under and subject to the terms of this Indenture, the Act and other applicable laws of the State. The Bonds may consist of one or more Series of varying denominations, dates, maturities, interest rates and other provisions, subject to the provisions and conditions contained herein. The Bonds shall be designated generally as the "City of Ontario Community Facilities District No. 54 (Esperanza Facilities) Special Tax Bonds," each Series thereof to bear such additional designation as may be necessary or appropriate to distinguish such Series from every other Series of Bonds.

(b) The Bonds shall be special, limited obligations of the Community Facilities District, payable, as provided herein, solely from Net Special Tax Revenues and the other assets pledged therefor hereunder. Neither the faith and credit nor the taxing power of the Community Facilities District (except to the limited extent set forth herein), the City or the State, or any political subdivision thereof, is pledged to the payment of the Bonds.

Section 2.02. Terms of Series 2022 Bonds. (a) The Series 2022 Bonds shall be designated "City of Ontario Community Facilities District No. 54 (Esperanza Facilities) Special Tax Bonds, Series 2022." The aggregate principal amount of Series 2022 Bonds that may be issued and Outstanding under this Indenture shall not exceed $_____, except as may be otherwise provided in Section 2.08.

(b) The Series 2022 Bonds shall be issued in fully registered form without coupons in Authorized Denominations, so long as no Series 2022 Bond shall have more than one maturity date. The Series 2022 Bonds shall be dated as of the Closing Date, shall be in the aggregate principal amount of $_____, shall mature on September 1 of each year, shall bear interest at the rates per annum (calculated on the basis of a 360-day year comprised of twelve 30-day months) and shall be in the principal amounts as follows:

Maturity Date (September 1)	Principal Amount	Interest Rate
	$	%

(c) Interest on the Series 2022 Bonds shall be payable from the Interest Payment Date next preceding the date of authentication thereof unless (i) a Series 2022 Bond is authenticated

on or before an Interest Payment Date and after the close of business on the preceding Record Date, in which event interest thereon shall be payable from such Interest Payment Date, (ii) a Series 2022 Bond is authenticated on or before the first Record Date, in which event interest thereon shall be payable from the Closing Date, or (iii) interest on any Series 2022 Bond is in default as of the date of authentication thereof, in which event interest thereon shall be payable from the date to which interest has previously been paid or duly provided for. Interest shall be paid in lawful money of the United States on each Interest Payment Date. Interest shall be paid by check of the Trustee mailed by first class mail, postage prepaid, on each Interest Payment Date to the Owners of the Series 2022 Bonds at their respective addresses shown on the Registration Books as of the close of business on the preceding Record Date. Notwithstanding the foregoing, interest on any Series 2022 Bond that is not punctually paid or duly provided for on any Interest Payment Date shall, if and to the extent that amounts subsequently become available therefor, be paid on a payment date established by the Trustee to the Person in whose name the ownership of such Series 2022 Bond is registered on the Registration Books at the close of business on a special record date to be established by the Trustee for the payment of such defaulted interest, notice of which shall be given to such Owner not less than ten days prior to such special record date.

(d) The principal of the Series 2022 Bonds shall be payable in lawful money of the United States of America upon presentation and surrender thereof upon maturity or earlier redemption at the Office of the Trustee.

(e) The Series 2022 Bonds shall be subject to redemption as provided in Article IV.

(f) The Series 2022 Bonds shall be in substantially the form set forth in Exhibit B hereto, with appropriate or necessary insertions, omissions and variations as permitted or required hereby.

Section 2.03. Execution of Bonds. The Bonds shall be executed in the name and on behalf of the Community Facilities District with the manual or facsimile signature of the Mayor of the City attested by the manual or facsimile signature of the City Clerk of the City. The Bonds shall then be delivered to the Trustee for authentication by it. In case any of such officers who shall have signed or attested any of the Bonds shall cease to be such officers before the Bonds so signed or attested shall have been authenticated or delivered by the Trustee, or issued by the Community Facilities District, such Bonds may nevertheless be authenticated, delivered and issued and, upon such authentication, delivery and issue, shall be as binding upon the Community Facilities District as though those who signed and attested the same had continued to be such officers, and also any Bonds may be signed and attested on behalf of the Community Facilities District by such Persons as at the actual date of execution of such Bonds shall be the proper officers of the City although at the nominal date of such Bonds any such Person shall not have been such officer of the City.

Section 2.04. Authentication of Bonds. Only such of the Bonds as shall bear thereon a certificate of authentication substantially in the form as that set forth in Exhibit B hereto for the Series 2022 Bonds, manually executed by the Trustee, shall be valid or obligatory for any purpose or entitled to the benefits of this Indenture, and such certificate of the Trustee shall be

conclusive evidence that the Bonds so authenticated have been duly executed, authenticated and delivered hereunder and are entitled to the benefits of this Indenture.

Section 2.05. Registration Books. The Trustee shall keep or cause to be kept, at the Office of the Trustee, sufficient records for the registration and transfer of ownership of the Bonds, which shall be open to inspection during regular business hours and upon reasonable notice by the Community Facilities District. Upon presentation for such purpose, the Trustee shall, under such reasonable regulations as it may prescribe, register or transfer or cause to be registered or transferred, on such records, the ownership of the Bonds.

Section 2.06. Transfer and Exchange of Bonds. (a) Any Bond may be transferred upon the Registration Books by the Person in whose name it is registered, in person or by such Person's duly authorized attorney, upon surrender of such Bond to the Trustee for cancellation, accompanied by delivery of a written instrument of transfer, duly executed in a form acceptable to the Trustee. Whenever any Bond or Bonds shall be so surrendered for transfer, the Community Facilities District shall execute and the Trustee shall authenticate and shall deliver a new Bond or Bonds of the same Series and maturity in a like aggregate principal amount, in any Authorized Denomination. The Trustee shall require the Owner requesting such transfer to pay any tax or other governmental charge required to be paid with respect to such transfer.

(b) The Bonds may be exchanged at the Office of the Trustee for a like aggregate principal amount of Bonds of the same Series and maturity of other Authorized Denominations. The Trustee shall require the payment by the Owner requesting such exchange of any tax or other governmental charge required to be paid with respect to such exchange.

(c) The Trustee shall not be obligated to make any transfer or exchange of Bonds of a Series pursuant to this Section during the period established by the Trustee for the selection of Bonds of such Series for redemption, or with respect to any Bonds of such Series selected for redemption.

Section 2.07. Book-Entry System. (a) Prior to the issuance of a Series of Bonds, the Community Facilities District may provide that such Series of Bonds shall initially be issued as Book-Entry Bonds, and in such event, the Bonds of such Series for each maturity date shall be in the form of a separate single fully registered Bond (which may be typewritten). Upon initial issuance, the ownership of each such Bond of such Series shall be registered in the Registration Books in the name of the Nominee, as nominee of the Depository. The Series 2022 Bonds shall initially be issued as Book-Entry Bonds.

Payment of principal of, and interest and premium, if any, on, any Book-Entry Bond registered in the name of the Nominee shall be made on the applicable payment date by wire transfer of New York clearing house or equivalent next day funds or by wire transfer of same day funds to the account of the Nominee. Such payments shall be made to the Nominee at the address which is, on the Record Date, shown for the Nominee in the Registration Books.

(b) With respect to Book-Entry Bonds, the Community Facilities District and the Trustee shall have no responsibility or obligation to any Participant or to any Person on behalf of which such a Participant holds an interest in such Book-Entry Bonds. Without limiting the

immediately preceding sentence, the Community Facilities District and the Trustee shall have no responsibility or obligation with respect to (i) the accuracy of the records of the Depository, the Nominee or any Participant with respect to any ownership interest in Book-Entry Bonds, (ii) the delivery to any Participant or any other Person, other than an Owner as shown in the Registration Books, of any notice with respect to Book-Entry Bonds, including any notice of redemption, (iii) the selection by the Depository and its Participants of the beneficial interests in Book-Entry Bonds of a maturity to be redeemed in the event such Book-Entry Bonds are redeemed in part, (iv) the payment to any Participant or any other Person, other than an Owner as shown in the Registration Books, of any amount with respect to principal of, or premium, if any, or interest on Book-Entry Bonds, or (v) any consent given or other action taken by the Depository as Owner.

(c) The Community Facilities District and the Trustee may treat and consider the Person in whose name each Book-Entry Bond is registered in the Registration Books as the absolute Owner of such Book-Entry Bond for the purpose of payment of principal of, and premium, if any, and interest on such Bond, for the purpose of selecting any Bonds, or portions thereof, to be redeemed, for the purpose of giving notices of redemption and other matters with respect to such Book-Entry Bond, for the purpose of registering transfers with respect to such Book-Entry Bond, for the purpose of obtaining any consent or other action to be taken by Owners and for all other purposes whatsoever, and the Community Facilities District and the Trustee shall not be affected by any notice to the contrary.

(d) In the event of a redemption of all or a portion of a Book-Entry Bond, the Depository, in its discretion (i) may request the Trustee to authenticate and deliver a new Book-Entry Bond, or (ii) if the Depository is the sole Owner of such Book-Entry Bond, shall make an appropriate notation on the Book-Entry Bond indicating the date and amounts of the reduction in principal thereof resulting from such redemption, except in the case of final payment, in which case such Book-Entry Bond must be presented to the Trustee prior to payment.

(e) The Trustee shall pay all principal of, and premium, if any, and interest on the Book-Entry Bonds only to or "upon the order of" (as that term is used in the Uniform Commercial Code as adopted in the State) the respective Owner, as shown in the Registration Books, or such Owner's respective attorney duly authorized in writing, and all such payments shall be valid and effective to fully satisfy and discharge the obligations with respect to payment of principal of, and premium, if any, and interest on the Book-Entry Bonds to the extent of the sum or sums so paid. No Person other than an Owner, as shown in the Registration Books, shall receive an authenticated Book-Entry Bond. Upon delivery by the Depository to the Owners, the Community Facilities District and the Trustee of written notice to the effect that the Depository has determined to substitute a new nominee in place of the Nominee, and subject to the provisions herein with respect to Record Dates, the word Nominee in this Indenture shall refer to such nominee of the Depository.

(f) In order to qualify the Book-Entry Bonds for the Depository's book-entry system, the Community Facilities District shall execute and deliver to the Depository a Letter of Representations. The execution and delivery of a Letter of Representations shall not in any way impose upon the Community Facilities District or the Trustee any obligation whatsoever with respect to Persons having interests in such Book-Entry Bonds other than the Owners, as shown on the Registration Books. Such Letter of Representations may provide the time, form, content

and manner of transmission, of notices to the Depository. In addition to the execution and delivery of a Letter of Representations by the Community Facilities District, the Community Facilities District and the Trustee shall take such other actions, not inconsistent with this Indenture, as are reasonably necessary to qualify Book-Entry Bonds for the Depository's book-entry program.

(g) In the event the Community Facilities District determines that it is in the best interests of the Beneficial Owners that they be able to obtain certificated Bonds and that such Bonds should therefore be made available and notifies the Depository and the Trustee of such determination, the Depository will notify the Participants of the availability through the Depository of certificated Bonds. In such event, the Trustee shall transfer and exchange certificated Bonds as requested by the Depository and any other Owners in appropriate amounts. In the event (i) the Depository determines not to continue to act as securities depository for Book-Entry Bonds, or (ii) the Depository shall no longer so act and gives notice to the Trustee of such determination, then the Community Facilities District shall discontinue the Book-Entry system with the Depository. If the Community Facilities District determines to replace the Depository with another qualified securities depository, the Community Facilities District shall prepare or direct the preparation of a new single, separate, fully registered Bond of the appropriate Series for each maturity date of such Book-Entry Bonds, registered in the name of such successor or substitute qualified securities depository or its nominee. If the Community Facilities District fails to identify another qualified securities depository to replace the Depository, then the Book-Entry Bonds shall no longer be restricted to being registered in the Registration Books in the name of the Nominee, but shall be registered in whatever name or names the Owners transferring or exchanging such Bonds shall designate, in accordance with the provisions of Sections 2.06, 2.08 and 2.09. Whenever the Depository requests the Community Facilities District to do so, the Community Facilities District shall cooperate with the Depository in taking appropriate action after reasonable notice (i) to make available one or more separate certificates evidencing the Book-Entry Bonds to any Participant having Book-Entry Bonds credited to its account with the Depository, and (ii) to arrange for another securities depository to maintain custody of certificates evidencing the Book-Entry Bonds.

(h) Notwithstanding any other provision of this Indenture to the contrary, if the Depository is the sole Owner of the Bonds of a Series, so long as any Book-Entry Bond of such Series is registered in the name of the Nominee, all payments of principal of, and premium, if any, and interest on such Book-Entry Bond and all notices with respect to such Book-Entry Bond shall be made and given, respectively, as provided in the Letter of Representations or as otherwise instructed by the Depository.

(i) In connection with any notice or other communication to be provided to Owners pursuant to this Indenture by the Community Facilities District or the Trustee, with respect to any consent or other action to be taken by Owners of Book-Entry Bonds, the Trustee shall establish a record date for such consent or other action and give the Depository notice of such record date not less than 15 calendar days in advance of such record date to the extent possible.

Section 2.08. <u>Bonds Mutilated, Lost, Destroyed or Stolen</u>. If any Bond shall become mutilated, the Community Facilities District, at the expense of the Owner of said Bond, shall execute, and the Trustee shall thereupon authenticate and deliver, a new Bond of the same Series

and maturity in a like principal amount in exchange and substitution for the Bond so mutilated, but only upon surrender to the Trustee of the Bond so mutilated. Every mutilated Bond so surrendered to the Trustee shall be canceled by it and delivered to, or upon the order of, the Community Facilities District. If any Bond shall be lost, destroyed or stolen, evidence of such loss, destruction or theft may be submitted to the Trustee and, if such evidence and indemnity reasonably satisfactory to the Trustee shall be given, the Community Facilities District, at the expense of the Owner, shall execute, and the Trustee shall thereupon authenticate and deliver, a new Bond of the same Series and maturity in a like aggregate principal amount in lieu of and in replacement for the Bond so lost, destroyed or stolen (or if any such Bond shall have matured or shall have been selected for redemption, instead of issuing a replacement Bond, the Trustee may pay the same without surrender thereof). The Community Facilities District may require payment by the Owner of a sum not exceeding the actual cost of preparing the replacement Bond delivered thereto under this Section and the expenses incurred by the Community Facilities District and the Trustee in connection therewith. Any Bond of a Series issued under the provisions of this Section in lieu of any Bond of such Series alleged to be lost, destroyed or stolen shall constitute an original additional contractual obligation on the part of the Community Facilities District whether or not the Bond so alleged to be lost, destroyed or stolen be at any time enforceable by anyone, and shall be entitled to the benefits of this Indenture with all other Bonds of such Series secured by this Indenture.

Section 2.09. Temporary Bonds. The Bonds of a Series may be issued in temporary form exchangeable for definitive Bonds of such Series when ready for delivery. Any temporary Bonds may be printed, lithographed or typewritten, shall be of such Authorized Denominations as may be determined by the Community Facilities District, shall be in fully registered form without coupons and may contain such reference to any of the provisions of this Indenture as may be appropriate. Every temporary Bond shall be executed by the Community Facilities District and authenticated by the Trustee upon the same conditions and in substantially the same manner as the definitive Bonds. If the Community Facilities District issues temporary Bonds of a Series it shall execute and deliver definitive Bonds of such Series as promptly thereafter as practicable, and thereupon the temporary Bonds of such Series may be surrendered, for cancellation, at the Office of the Trustee and the Trustee shall authenticate and deliver in exchange for such temporary Bonds an equal aggregate principal amount of definitive Bonds of such Series and maturities in Authorized Denominations. Until so exchanged, the temporary Bonds of such Series shall be entitled to the same benefits under this Indenture as definitive Bonds of such Series authenticated and delivered hereunder.

ARTICLE III

ISSUANCE OF SERIES 2022 BONDS; APPLICATION OF PROCEEDS; ADDITIONAL BONDS

Section 3.01. Issuance of Series 2022 Bonds. The Community Facilities District may at any time execute the Series 2022 Bonds and deliver the same to the Trustee. The Trustee shall authenticate the Series 2022 Bonds and deliver the Series 2022 Bonds to the Original Purchaser upon receipt of a Written Request of the Community Facilities District and upon receipt of the purchase price therefor.

Section 3.02. Application of Proceeds. (a) On the Closing Date, the proceeds of the sale of the Series 2022 Bonds received by the Trustee, $_____, shall be deposited by the Trustee as follows:

(i) the Trustee shall deposit the amount of $_____ in the Costs of Issuance Fund;

(ii) the Trustee shall deposit the amount of $_____ in the Reserve Fund, which is equal to the Reserve Requirement;

(iii) the Trustee shall deposit the amount of $_____ in the GDC/CDG Esperanza Acquisition Account; and

(iv) the Trustee shall deposit the amount of $_____ in the NMC Acquisition Account.

(b) [On the Closing Date, Special Taxes collected by the City received by the Trustee, $_____, shall be deposited by the Trustee as follows:

(i) the Trustee shall deposit the amount of $_____ in the Administrative Expense Fund; and

(ii) the Trustee shall deposit the amount of $_____ in the GDC/CDG Esperanza Acquisition Account.]

Section 3.03. Costs of Issuance Fund. (a) The Trustee shall establish and maintain a separate fund designated the "Costs of Issuance Fund." On the Closing Date, the Trustee shall deposit in the Costs of Issuance Fund the amount required to be deposited therein pursuant to Section 3.02. There shall additionally be deposited in the Cost of Issuance Fund the portion, if any, of the proceeds of the sale of any Additional Bonds required to be deposited therein under the Supplemental Indenture pursuant to which such Additional Bonds are issued.

(b) The moneys in the Costs of Issuance Fund shall be used and withdrawn by the Trustee from time to time to pay the Costs of Issuance upon submission of a Written Request of the Community Facilities District stating (i) the Person to whom payment is to be made, (ii) the amount to be paid and instructions for such payment, (iii) the purpose for which the obligation was incurred, (iv) that such payment is a proper charge against the Costs of Issuance Fund, and

(v) that such amount has not been the subject of a prior disbursement from the Costs of Issuance Fund, in each case together with a statement or invoice for each amount requested thereunder. On the last Business Day that is no later than six months after the Closing Date, the Trustee shall transfer any amount remaining in the Costs of Issuance Fund to the NMC Acquisition Account and, upon making such transfer, the Costs of Issuance Fund shall be closed.

(c) If the Costs of Issuance Fund has been closed in accordance with the provisions hereof, a Costs of Issuance Fund shall be reestablished by the Trustee in connection with the issuance of any Additional Bonds, if so provided in the Supplemental Indenture pursuant to which such Additional Bonds are issued.

Section 3.04. Improvement Fund. (a) The Trustee shall establish and maintain a separate fund designated the "Improvement Fund." Within the Improvement Fund, the Trustee shall establish and maintain a separate account designated the "GDC/CDG Esperanza Acquisition Account," a separate account designated the "NMC Acquisition Account" and a separate account designated the "City Facilities Account." On the Closing Date, the Trustee shall deposit in the GDC/CDG Esperanza Acquisition Account and the NMC Acquisition Account the respective amounts required to be deposited therein pursuant to Section 3.02. There shall additionally be deposited in the GDC/CDG Esperanza Acquisition Account, the NMC Acquisition Account or the City Facilities Account amounts received by the Trustee when accompanied by a Written Request of the Community Facilities District that such amounts are to be deposited in such account, which amounts may include Special Tax Revenues collected and received by the Community Facilities District prior to the Closing Date.

(b) The moneys in the GDC/CDG Esperanza Acquisition Account shall be used and withdrawn by the Trustee from time to time to pay the costs of the GDC/CDG Esperanza Facilities upon submission of a Written Request of the Community Facilities District stating (i) the Person to whom payment is to be made, (ii) the amount to be paid and instructions for such payment, (iii) the purpose for which the obligation was incurred, (iv) that such payment constitutes a cost of the GDC/CDG Esperanza Facilities and is a proper charge against the GDC/CDG Esperanza Acquisition Account, (v) that such amount has not been the subject of a prior disbursement from the GDC/CDG Esperanza Acquisition Account, and (vi) whether or not such costs of the GDC/CDG Esperanza Facilities are to be paid pursuant to a GDC/CDG Esperanza Payment Request submitted in accordance with the GDC/CDG Esperanza Acquisition Agreement, in each case together with a statement or invoice for each amount requested thereunder. If costs of the GDC/CDG Esperanza Facilities are to be paid pursuant to a GDC/CDG Esperanza Payment Request submitted in accordance with the GDC/CDG Esperanza Acquisition Agreement, a duplicate original of the signed and approved GDC/CDG Esperanza Payment Request relating to such costs of the GDC/CDG Esperanza Facilities, together with all exhibits and attachments thereto, must accompany such Written Request of the Community Facilities District.

Upon the filing of a Written Certificate of the Community Facilities District stating (i) that the portion of the GDC/CDG Esperanza Facilities to be financed from the GDC/CDG Esperanza Acquisition Account has been completed and that all costs of such GDC/CDG Esperanza Facilities have been paid, or (ii) that such portion of the GDC/CDG Esperanza Facilities has been substantially completed and that all remaining costs of such portion of the GDC/CDG Esperanza

Facilities have been determined and specifying the amount to be retained therefor, the Trustee shall transfer all of the amount remaining in the GDC/CDG Esperanza Acquisition Account (less any such retention) to the NMC Acquisition Account.

(c) The moneys in the NMC Acquisition Account shall be used and withdrawn by the Trustee from time to time to pay the costs of the NMC Facilities upon submission of a Written Request of the Community Facilities District stating (i) the Person to whom payment is to be made, (ii) the amount to be paid and instructions for such payment, (iii) the purpose for which the obligation was incurred, (iv) that such payment constitutes a cost of the NMC Facilities and is a proper charge against the NMC Acquisition Account, (v) that such amount has not been the subject of a prior disbursement from the NMC Acquisition Account, and (vi) whether or not such costs of the NMC Facilities are to be paid pursuant to a NMC Payment Request submitted in accordance with the NMC Acquisition Agreement, in each case together with a statement or invoice for each amount requested thereunder. If costs of the NMC Facilities are to be paid pursuant to a NMC Payment Request submitted in accordance with the NMC Acquisition Agreement, a duplicate original of the signed and approved NMC Payment Request relating to such costs of the NMC Facilities, together with all exhibits and attachments thereto, must accompany such Written Request of the Community Facilities District.

If, on the date the Community Facilities District submits to the Trustee a Written Request of the Community Facilities District to pay costs of the NMC Facilities, there are insufficient moneys in the NMC Acquisition Account to pay such costs in full, the amount remaining unpaid shall be paid as and to the extent that moneys are subsequently deposited in the NMC Acquisition Account, but only after the payment in full of all amounts that the Community Facilities District, by a Written Request of the Community Facilities District, previously directed the Trustee to pay from the NMC Acquisition Account.

If the NMC Payment Request submitted to the Trustee pursuant to this subsection requests that the costs of the NMC Facilities to be paid thereunder be paid to the Person or Persons, in the amounts, set forth in the completed Purchase Price Payment Instructions attached to such NMC Payment Request as Attachment B, the Trustee shall, as and when amounts become available in the NMC Acquisition Account to pay all or a portion of such costs, pay from the NMC Acquisition Account such costs or portion thereof to such Person or Persons. If the NMC Payment Request submitted to the Trustee pursuant to this subsection indicates that the costs of the NMC Facilities to be paid thereunder be paid to the Person or Persons, in the amounts, to be set forth in Purchase Price Payment Instructions to be submitted to the Trustee as and when amounts become available in the NMC Acquisition Account to pay all or a portion of such costs, the Trustee shall, as and when such amounts become available, notify NMC Builders in writing of (i) the number or other designation of the NMC Payment Request pursuant to which such payment of such costs is requested to be made, (ii) the amount available in the NMC Acquisition Account to pay such costs or portion thereof, and (iii) the name of the Community Facilities District, and, upon submission to the Trustee by NMC Builders of completed and signed Purchase Price Payment Instructions in the form attached to such NMC Payment Request as Attachment B, the Trustee shall pay from the NMC Acquisition Account such costs or portion thereof to the Person or Persons, in the amounts, set forth in such Purchase Price Payment Instructions.

If, on the date the Community Facilities District submits to the Trustee a Written Request of the Community Facilities District to pay 85% of the costs of a Circulation System Facility, there are insufficient moneys in the NMC Acquisition Account to pay such portion of such costs in full, the amount remaining unpaid shall be paid as and to the extent that moneys are subsequently deposited in the NMC Acquisition Account, but only after the payment in full of all amounts that the Community Facilities District, by a Written Request of the Community Facilities District, previously directed the Trustee to pay from the NMC Acquisition Account.

If the NMC Payment Request submitted to the Trustee pursuant to this subsection requests that 85% of the costs of a Circulation System Facility to be paid thereunder be paid to the Person or Persons, in the amounts, set forth in the completed Purchase Price Payment Instructions attached to such NMC Payment Request as Attachment B, the Trustee shall, as and when amounts become available in the NMC Acquisition Account to pay all or a portion of such costs, pay from the NMC Acquisition Account such costs or portion thereof to such Person or Persons. If the NMC Payment Request submitted to the Trustee pursuant to this subsection indicates that 85% of the costs of a Circulation System Facility to be paid thereunder be paid to the Person or Persons, in the amounts, to be set forth in Purchase Price Payment Instructions to be submitted to the Trustee as and when amounts become available in the NMC Acquisition Account to pay all or a portion of such costs, the Trustee shall, as and when such amounts become available, notify NMC Builders in writing of (i) the number or other designation of the NMC Payment Request pursuant to which such payment of such costs is requested to be made, (ii) the amount available in the NMC Acquisition Account to pay such costs or portion thereof, and (iii) the name of the Community Facilities District, and, upon submission to the Trustee by NMC Builders of completed and signed Purchase Price Payment Instructions in the form attached to such NMC Payment Request as Attachment B, the Trustee shall pay from the NMC Acquisition Account such costs or portion thereof to the Person or Persons, in the amounts, set forth in such Purchase Price Payment Instructions.

Upon the filing of a Written Certificate of the Community Facilities District stating (i) that the portion of the NMC Facilities to be financed from the NMC Acquisition Account has been completed and that all costs of such NMC Facilities have been paid, or (ii) that such portion of the NMC Facilities has been substantially completed and that all remaining costs of such portion of the NMC Facilities have been determined and specifying the amount to be retained therefor, the Trustee shall (A) if the amount remaining in the NMC Acquisition Account (less any such retention) is equal to or greater than $25,000, transfer the portion of such amount equal to the largest integral multiple of $5,000 that is not greater than such amount to the Redemption Fund, to be applied to the redemption of Bonds as directed by the Community Facilities District, and (B) after making the transfer, if any, required to be made pursuant to the preceding clause (A), transfer all of the amount remaining in the NMC Acquisition Account (less any such retention) to the Interest Account, to be applied to the payment of interest on the Bonds.

(d) The moneys in the City Facilities Account shall be used and withdrawn by the Trustee from time to time to pay the costs of the Facilities upon submission of a Written Request of the Community Facilities District stating (i) the Person to whom payment is to be made, (ii) the amount to be paid and instructions for such payment, (iii) the purpose for which the obligation was incurred, (iv) that such payment constitutes a cost of the Facilities and is a proper charge against the City Facilities Account, and (v) that such amount has not been the subject of a

prior disbursement from the City Facilities Account, in each case together with a statement or invoice for each amount requested thereunder.

Upon the filing of a Written Certificate of the Community Facilities District stating (i) that the portion of the Facilities to be financed from the City Facilities Account has been completed and that all costs of such Facilities have been paid, or (ii) that such portion of the Facilities has been substantially completed and that all remaining costs of such portion of the Facilities have been determined and specifying the amount to be retained therefor, the Trustee shall (A) if the amount remaining in the City Facilities Account (less any such retention) is equal to or greater than $25,000, transfer the portion of such amount equal to the largest integral multiple of $5,000 that is not greater than such amount to the Redemption Fund, to be applied to the redemption of Bonds as directed by the Community Facilities District, and (B) after making the transfer, if any, required to be made pursuant to the preceding clause (A), transfer all of the amount remaining in the City Facilities Account (less any such retention) to the Interest Account, to be applied to the payment of interest on the Bonds.

Section 3.05. Conditions for the Issuance of Additional Bonds. The Community Facilities District may at any time issue one or more Series of Additional Bonds payable from Net Special Tax Revenues as provided herein on a parity with all other Bonds theretofore issued hereunder, but only subject to the following conditions, which are hereby made conditions precedent to the issuance of such Additional Bonds:

(a) upon the issuance of such Additional Bonds, no Event of Default shall have occurred and be continuing hereunder;

(b) the issuance of such Additional Bonds shall have been authorized under and pursuant to this Indenture and the Act and shall have been provided for by a Supplemental Indenture which shall specify the following:

(i) the purposes for which the proceeds of such Additional Bonds are to be applied, which purposes may only include one or more of (A) providing funds to refund any Bonds previously issued hereunder, (B) providing funds to pay Costs of Issuance incurred in connection with the issuance of such Additional Bonds, and (C) providing funds to make any deposit to the Reserve Fund required pursuant to paragraph (vii) below;

(ii) the designation of such Series of Additional Bonds, the aggregate principal amount of the Additional Bonds of such Series, and the principal amount of, and the interest rate to be borne by, each maturity of such Additional Bonds;

(iii) that such Additional Bonds shall be payable as to interest on the Interest Payment Dates, except that the first installment of interest may be payable on either March 1 or September 1 and shall be for a period of not longer than twelve months;

(iv) the date, the maturity date or dates and the dates on which mandatory sinking fund redemptions, if any, are to be made for such Additional

Bonds; provided, however, that each such maturity date and date on which a mandatory sinking fund redemption is to be made shall be a September 1 and, provided, further, that serial maturities of serial Bonds or mandatory sinking fund redemptions for term Bonds, or any combination thereof, shall be established to provide for the redemption or payment of such Additional Bonds on or before their respective maturity dates;

(v) the redemption premiums and terms, if any, for such Additional Bonds;

(vi) the form of such Additional Bonds;

(vii) the amount, if any, to be deposited from the proceeds of sale of such Additional Bonds in the Reserve Fund; provided, however, that the amount on deposit in the Reserve Fund at the time that such Additional Bonds become Outstanding shall be at least equal to the Reserve Requirement; and

(viii) such other provisions that are appropriate or necessary and are not inconsistent with the provisions hereof;

(c) The Community Facilities District shall have received a certificate from an Independent Consultant certifying that Annual Debt Service in each Bond Year, calculated for all Bonds that will be Outstanding after the issuance of such Additional Bonds, will be less than or equal to Annual Debt Service in such Bond Year, calculated for all Bonds that are Outstanding immediately prior to the issuance of such Additional Bonds.

Nothing contained herein shall limit the issuance of any special tax bonds payable from Special Taxes if, after the issuance and delivery of such special tax bonds, none of the Bonds theretofore issued hereunder will be Outstanding.

Section 3.06. Procedure for the Issuance of Additional Bonds. At any time after the sale of any Additional Bonds in accordance with the Act, such Additional Bonds shall be executed by the Community Facilities District for issuance hereunder and shall be delivered to the Trustee and thereupon shall be authenticated and delivered by the Trustee, but only upon receipt by the Trustee of the following:

(a) a certified copy of the Supplemental Indenture authorizing the issuance of such Additional Bonds;

(b) a Written Request of the Community Facilities District as to the delivery of such Additional Bonds;

(c) a Written Certificate of the Community Facilities District stating that the conditions precedent to the issuance of such Additional Bonds specified in Section 3.05 have been satisfied;

(d) an opinion of Bond Counsel substantially to the effect that (i) this Indenture, as modified and amended by all Supplemental Indentures theretofore, or thereupon being, entered into has been duly authorized, executed and delivered by, and constitutes the valid and binding obligation of, the Community Facilities District, enforceable in accordance with its terms, (ii) such Additional Bonds constitute valid and binding special obligations of the Community Facilities District, and (iii) the issuance of such Additional Bonds, in and of itself, will not adversely affect the exclusion of interest on the Bonds Outstanding prior to the issuance of such Additional Bonds from gross income for federal income tax purposes;

(e) the proceeds of the sale of such Additional Bonds; and

(f) such further documents or money as are required by the provisions hereof or by the provisions of the Supplemental Indenture pursuant to which such Additional Bonds are issued.

Section 3.07. Additional Bonds. The Community Facilities District shall not incur any obligations payable from Net Special Tax Revenues on a parity with the Bonds, except as provided in Sections 3.05 and 3.06.

ARTICLE IV

REDEMPTION OF BONDS

Section 4.01. Redemption of Series 2022 Bonds. (a) *Optional Redemption.* The Series 2022 Bonds maturing on and after September 1, 20__, shall be subject to optional redemption, in whole, or in part in Authorized Denominations, on any Interest Payment Date on or after September 1, 20__ from any source of available funds, at the following respective Redemption Prices (expressed as percentages of the principal amount of the Series 2022 Bonds to be redeemed), plus accrued interest thereon to the date of redemption:

Redemption Dates	Redemption Price
September 1, 20__ and March 1, 20__	103%
September 1, 20__ and March 1, 20__	102
September 1, 20__ and March 1, 20__	101
September 1, 20__ and any Interest Payment Date thereafter	100

The Community Facilities District shall give the Trustee written notice of its intention to redeem Series 2022 Bonds pursuant to this subsection not less than 45 days prior to the applicable redemption date, unless a later date is agreed to by the Trustee.

(b) *Mandatory Redemption from Special Tax Prepayments.* The Series 2022 Bonds shall be subject to mandatory redemption, in whole, or in part in Authorized Denominations, on any Interest Payment Date, from and to the extent of prepaid Special Taxes required to be applied thereto pursuant to Section 5.02(a) and any amount required to be applied thereto pursuant to Section 5.04(c), at the following respective Redemption Prices (expressed as percentages of the principal amount of the Series 2022 Bonds to be redeemed), plus accrued interest thereon to the date of redemption:

Redemption Dates	Redemption Price
March 1, 20__ through March 1, 20__	103%
September 1, 20__ and March 1, 20__	102
September 1, 20__ and March 1, 20__	101
September 1, 20__ and any Interest Payment Date thereafter	100

(c) *Mandatory Sinking Fund Redemption.* The Series 2022 Bonds maturing September 1, 20__ shall be subject to mandatory sinking fund redemption, in part, on September 1 in each year, commencing September 1, 20__, at a Redemption Price equal to the principal amount of the Series 2022 Bonds maturing September 1, 20__ to be redeemed, without premium, plus accrued interest thereon to the date of redemption, in the aggregate respective principal amounts in the respective years as follows:

Sinking Fund Redemption Date (September 1)	Principal Amount to be Redeemed
	$

(Maturity)

If some but not all of the Series 2022 Bonds maturing on September 1, 20__ are redeemed pursuant to Section 4.01(a), the principal amount of the Series 2022 Bonds maturing on September 1, 20__ to be redeemed pursuant to Section 4.01(c) on any subsequent September 1 shall be reduced, by $5,000 or an integral multiple thereof, as designated by the Community Facilities District in a Written Certificate of the Community Facilities District filed with the Trustee; provided, however, that the aggregate amount of such reductions shall not exceed the aggregate amount of the Series 2022 Bonds maturing on September 1, 20__ redeemed pursuant to Section 4.01(a). If some but not all of the Series 2022 Bonds maturing on September 1, 20__ are redeemed pursuant to Section 4.01(b), the principal amount of the Series 2022 Bonds maturing on September 1, 20__ to be redeemed pursuant to Section 4.01(c) on any subsequent September 1 shall be reduced by the aggregate principal amount of the Series 2022 Bonds maturing on September 1, 20__ so redeemed pursuant to Section 4.01(b), such reduction to be allocated among redemption dates as nearly as practicable on a pro rata basis in amounts of $5,000 or integral multiples thereof, as determined by the Trustee, notice of which determination shall be given by the Trustee to the Community Facilities District.

The Series 2022 Bonds maturing September 1, 20__ shall be subject to mandatory sinking fund redemption, in part, on September 1 in each year, commencing September 1, 20__, at a Redemption Price equal to the principal amount of the Series 2022 Bonds maturing September 1, 20__ to be redeemed, without premium, plus accrued interest thereon to the date of redemption, in the aggregate respective principal amounts in the respective years as follows:

Sinking Fund Redemption Date (September 1)	Principal Amount to be Redeemed
	$

(Maturity)

If some but not all of the Series 2022 Bonds maturing on September 1, 20__ are redeemed pursuant to Section 4.01(a), the principal amount of the Series 2022 Bonds maturing on September 1, 20__ to be redeemed pursuant to Section 4.01(c) on any subsequent September 1 shall be reduced, by $5,000 or an integral multiple thereof, as designated by the Community Facilities District in a Written Certificate of the Community Facilities District filed with the Trustee; provided, however, that the aggregate amount of such reductions shall not exceed the aggregate amount of the Series 2022 Bonds maturing on September 1, 20__ redeemed pursuant to Section

4.01(a). If some but not all of the Series 2022 Bonds maturing on September 1, 20__ are redeemed pursuant to Section 4.01(b), the principal amount of the Series 2022 Bonds maturing on September 1, 20__ to be redeemed pursuant to Section 4.01(c) on any subsequent September 1 shall be reduced by the aggregate principal amount of the Series 2022 Bonds maturing on September 1, 20__ so redeemed pursuant to Section 4.01(b), such reduction to be allocated among redemption dates as nearly as practicable on a pro rata basis in amounts of $5,000 or integral multiples thereof, as determined by the Trustee, notice of which determination shall be given by the Trustee to the Community Facilities District.

Section 4.02. Notice of Redemption. The Trustee on behalf and at the expense of the Community Facilities District shall mail (by first class mail) notice of any redemption to the respective Owners of any Bonds designated for redemption at their respective addresses appearing on the Registration Books and to the Original Purchaser at least 30 but not more than 60 days prior to the date fixed for redemption. Such notice shall state the date of the notice, the redemption date, the redemption place and the Redemption Price and shall designate the CUSIP numbers, if any, the Bond numbers and the maturity or maturities of the Bonds to be redeemed (except in the event of redemption of all of the Bonds of such maturity or maturities in whole), and shall require that such Bonds be then surrendered at the Office of the Trustee for redemption at the Redemption Price, giving notice also that further interest on such Bonds will not accrue from and after the date fixed for redemption. Neither the failure to receive any notice so mailed, nor any defect in such notice, shall affect the validity of the proceedings for the redemption of the Bonds or the cessation of accrual of interest thereon from and after the date fixed for redemption. With respect to any notice of any optional redemption of Bonds of a Series, unless at the time such notice is given the Bonds to be redeemed shall be deemed to have been paid within the meaning of Section 10.02, such notice shall state that such redemption is conditional upon receipt by the Trustee, on or prior to the date fixed for such redemption, of moneys that, together with other available amounts held by the Trustee, are sufficient to pay the Redemption Price of, and accrued interest on, the Bonds to be redeemed, and that if such moneys shall not have been so received said notice shall be of no force and effect and the Community Facilities District shall not be required to redeem such Bonds. In the event a notice of redemption of Bonds contains such a condition and such moneys are not so received, the redemption of Bonds as described in the conditional notice of redemption shall not be made and the Trustee shall, within a reasonable time after the date on which such redemption was to occur, give notice to the Persons and in the manner in which the notice of redemption was given, that such moneys were not so received and that there shall be no redemption of Bonds pursuant to such notice of redemption.

Section 4.03. Selection of Bonds for Redemption. Whenever provision is made in this Indenture for the redemption of less than all of the Bonds, the Trustee shall select the Bonds to be redeemed from all Bonds not previously called for redemption (a) with respect to any optional redemption of Bonds of a Series, among maturities of Bonds of such Series as directed in a Written Request of the Community Facilities District, (b) with respect to any redemption pursuant to Section 4.01(b) and the corresponding provisions of any Supplemental Indenture pursuant to which Additional Bonds are issued, among maturities of all Series of Bonds on a *pro rata* basis as nearly as practicable, and (c) with respect to any other redemption of Additional Bonds, among maturities as provided in the Supplemental Indenture pursuant to which such Additional Bonds are issued, and by lot among Bonds of the same Series with the same maturity in any manner which the Trustee in its sole discretion shall deem appropriate. For purposes of

such selection, all Bonds shall be deemed to be comprised of separate $5,000 denominations and such separate denominations shall be treated as separate Bonds that may be separately redeemed.

Section 4.04. Partial Redemption of Bonds. Upon surrender of any Bonds redeemed in part only, the Community Facilities District shall execute and the Trustee shall authenticate and deliver to the Owner thereof, at the expense of the Community Facilities District, a new Bond or Bonds of the same Series in Authorized Denominations in an aggregate principal amount equal to the unredeemed portion of the Bonds surrendered.

Section 4.05. Effect of Notice of Redemption. Notice of redemption of the Bonds subject to redemption having been mailed as aforesaid, and moneys for the Redemption Price thereof, and the interest thereon to the applicable date fixed for redemption, having been set aside with the Trustee, such Bonds shall become due and payable on said date, and, upon presentation and surrender thereof at the Office of the Trustee, said Bonds shall be paid at the Redemption Price thereof, together with interest accrued and unpaid to said date.

If, on said date fixed for redemption, moneys for the Redemption Price of all the Bonds to be redeemed, together with interest to said date, shall be held by the Trustee so as to be available therefor on such date, and, if notice of redemption thereof shall have been mailed as aforesaid and not canceled, then, from and after said date, interest on said Bonds shall cease to accrue and become payable. All moneys held by or on behalf of the Trustee for the redemption of Bonds shall be held in trust for the account of the Owners of the Bonds so to be redeemed without liability to such Owners for interest thereon.

All Bonds paid at maturity or redeemed prior to maturity pursuant to the provisions hereof shall be canceled upon surrender thereof and destroyed.

ARTICLE V

SECURITY FOR BONDS; FLOW OF FUNDS; INVESTMENTS

Section 5.01. Pledge. Subject only to the provisions of this Indenture permitting the application thereof for the purposes and on the terms and conditions set forth herein, in order to secure the payment of the principal of, premium, if any, and interest on the Bonds in accordance with their terms, the provisions of this Indenture and the Act, the Community Facilities District hereby pledges to the Owners, and grants thereto a lien on and a security interest in, all of the Net Special Tax Revenues and any other amounts held in the Special Tax Fund, the Bond Fund and the Reserve Fund. Said pledge shall constitute a first lien on and security interest in such assets, which shall immediately attach to such assets and be effective, binding and enforceable against the Community Facilities District, its successors, purchasers of any of such assets, creditors and all others asserting rights therein, to the extent set forth in, and in accordance with, this Indenture, irrespective of whether those parties have notice of the pledge of, lien on and security interest in such assets and without the need for any physical delivery, recordation, filing or further act.

Section 5.02. Special Tax Fund. (a) The Trustee shall establish and maintain a separate fund designated the "Special Tax Fund." As soon as practicable after the receipt by the Community Facilities District of any Special Tax Revenues, but in any event no later than the date ten Business Days after such receipt, the Community Facilities District shall transfer such Special Tax Revenues to the Trustee for deposit in the Special Tax Fund; provided, however, that with respect to any such Special Tax Revenues that represent prepaid Special Taxes (i) said prepaid Special Taxes shall be identified as such in a Written Certificate of the Community Facilities District delivered to the Trustee at the time such prepaid Special Taxes are transferred to the Trustee, (ii) the portion of such prepaid Special Taxes that is to be applied to the Redemption Price of the Bonds shall be identified in such Written Certificate of the Community Facilities District, shall be deposited by the Trustee in the Redemption Fund and shall be applied to the redemption of Bonds pursuant to Section 4.01(b) and the corresponding provisions of any Supplemental Indenture pursuant to which Additional Bonds are issued, and (iii) the portion of such prepaid Special Taxes that is to be applied to the payment of interest on the Bonds to be so redeemed shall be identified in such Written Certificate of the Community Facilities District, shall be deposited by the Trustee in the Interest Account and shall be applied to the payment of such interest.

(b) Upon receipt of a Written Request of the Community Facilities District, the Trustee shall withdraw from the Special Tax Fund and transfer to the Administrative Expense Fund the amount specified in such Written Request of the Community Facilities District as the amount necessary to be transferred thereto in order to have sufficient amounts available therein to pay Administrative Expenses.

(c) No later than the Business Day immediately preceding each Interest Payment Date, after having made any requested transfer to the Administrative Expense Fund, the Trustee shall withdraw from the Special Tax Fund Net Special Tax Revenues in an amount sufficient to enable the Trustee to make the following transfers in the following order of priority:

(i) *Interest Account*. To the Interest Account, the amount, if any, necessary to cause the amount on deposit in the Interest Account to be equal to the interest due on the Bonds on such Interest Payment Date;

(ii) *Principal Account*. To the Principal Account, the amount, if any, necessary to cause the amount on deposit in the Principal Account to be equal to the principal, if any, due on the Bonds on such Interest Payment Date, including principal due and payable by reason of mandatory sinking fund redemption of such Bonds; and

(iii) *Reserve Fund*. To the Reserve Fund, the amount, if any, necessary to cause the amount in the Reserve Fund to be equal to the Reserve Requirement.

(d) So long as the City Facilities Account has not been closed pursuant to Section 3.04(d), on each September 2, after having made any requested transfer to the Administrative Expense Fund, the Trustee shall transfer from the Special Tax Fund to the City Facilities Account any amount remaining in the Special Tax Fund; provided, however, that the Community Facilities District may, in a Written Request of the Community Facilities District submitted to the Trustee prior to such September 2, direct the Trustee to retain in the Special Tax Fund all or a portion of such remaining amount.

Section 5.03. Bond Fund. (a) The Trustee shall establish and maintain a separate fund designated the "Bond Fund." Within the Bond Fund, the Trustee shall establish and maintain a separate account designated the "Principal Account" and a separate account designated the "Interest Account." The Trustee shall deposit in the Interest Account and the Principal Account from time to time the amounts required to be deposited therein pursuant to Section 5.02. There shall additionally be deposited in the Interest Account the portion, if any, of the proceeds of the sale of Additional Bonds required to be deposited therein under the Supplemental Indenture pursuant to which such Additional Bonds are issued.

(b) In the event that, on the Business Day prior to an Interest Payment Date, after the deposit in the Interest Account of the amounts required to be deposited therein pursuant to Section 5.02, amounts in the Interest Account are insufficient to pay the interest on the Bonds due and payable on such Interest Payment Date, the Trustee shall withdraw from the Reserve Fund, to the extent of any funds therein, the amount of such insufficiency, and shall transfer any amounts so withdrawn to the Interest Account.

(c) On each Interest Payment Date, the Trustee shall withdraw from the Interest Account for payment to the Owners of the Bonds the interest on the Bonds then due and payable.

(d) In the event that, on the Business Day prior to a September 1 on which principal of the Bonds is due and payable, after the deposit in the Principal Account of the amounts required to be deposited therein pursuant to Section 5.02, including principal due and payable by reason of mandatory sinking fund redemption of the Bonds, amounts in the Principal Account are insufficient to pay such principal, after having withdrawn any amounts from the Reserve Fund required to be withdrawn therefrom on such date pursuant to subsection (b) of this Section, the Trustee shall withdraw from the Reserve Fund, to the extent of any funds therein, the amount of such insufficiency, and shall transfer any amounts so withdrawn to the Principal Account.

(e) On each September 1 on which principal of the Bonds is due and payable, including principal due and payable by reason of mandatory sinking fund redemption of the Bonds, the Trustee shall withdraw from the Principal Account for payment to the Owners of the Bonds such principal then due and payable.

Section 5.04. Reserve Fund. (a) The Trustee shall establish and maintain a special fund designated the "Reserve Fund." On the Closing Date, the Trustee shall deposit in the Reserve Fund the amount specified in Section 3.02. The Trustee shall deposit in the Reserve Fund from time to time the amounts required to be deposited therein pursuant to Section 5.02(c). There shall additionally be deposited in the Reserve Fund, in connection with the issuance of Additional Bonds, the amount required to be deposited therein under the Supplemental Indenture pursuant to which such Additional Bonds are issued.

(b) Except as otherwise provided in this Section, amounts in the Reserve Fund shall be used and withdrawn by the Trustee solely for the purpose of (i) making transfers to the Interest Account in accordance with Section 5.03(b) in the event of any deficiency in the Interest Account of the amount then required for payment of the interest on the Bonds, (ii) making transfers to the Principal Account in accordance with Section 5.03(d) in the event of any deficiency in the Principal Account of the amount then required for payment of the principal of the Bonds, and (iii) redeeming Bonds in accordance with the provisions of this Section.

(c) Whenever Bonds are to be optionally redeemed or redeemed from Special Tax prepayments, a proportionate share, determined as provided below, of the amount on deposit in the Reserve Fund shall, on the date on which amounts to redeem such Bonds are deposited in the Redemption Fund or otherwise deposited with the Trustee pursuant to Section 10.02, be transferred by the Trustee from the Reserve Fund to the Redemption Fund or to such deposit held by the Trustee and shall be applied to the redemption of said Bonds; provided, however, that such amount shall be so transferred only if and to the extent that the amount remaining on deposit in the Reserve Fund will be at least equal to the Reserve Requirement (excluding from the calculation thereof said Bonds to be redeemed). Such proportionate share shall be equal to the largest integral multiple of the minimum Authorized Denomination for said Bonds that is not larger than the amount equal to the product of (i) the amount on deposit in the Reserve Fund on the date of such transfer, times (ii) a fraction, the numerator of which is the principal amount of Bonds to be so redeemed and the denominator of which is the principal amount of Bonds to be Outstanding on the day prior to the date on which such Bonds are to be so redeemed.

(d) Whenever the balance in the Reserve Fund exceeds the amount required to redeem or pay all Outstanding Bonds, including interest accrued to the date of payment or redemption and premium, if any, due upon redemption, the Trustee shall, upon receipt of a Written Request of the Community Facilities District, transfer the amount in the Reserve Fund to the Interest Account, Principal Account and/or Redemption Fund, as applicable, to be applied, on the next succeeding Interest Payment Date to the payment and redemption of all of the Outstanding Bonds.

(e) If, as a result of the scheduled payment of principal of or interest on the Bonds, the Reserve Requirement is reduced, the Trustee shall transfer an amount equal to the amount of such reduction to the Interest Account.

Section 5.05. Redemption Fund. (a) The Trustee shall establish and maintain a special fund designated the "Redemption Fund." The Trustee shall deposit in the Redemption Fund (i) amounts received from the Community Facilities District in connection with the Community Facilities District's exercise of its rights to optionally redeem Bonds, (ii) the portion of prepaid Special Taxes required to be deposited therein pursuant to Section 5.02(a), (iii) amounts required to be transferred to the Redemption Fund from the Improvement Fund (or accounts therein) pursuant to Section 3.04(c) or Section 3.04(d), (iv) amounts required to be transferred to the Redemption Fund from the Reserve Fund pursuant to Section 5.04(c) or Section 5.04(d), and (v) amounts required to be deposited therein pursuant to any Supplemental Indenture.

(b) Amounts in the Redemption Fund shall be disbursed therefrom for the payment of the Redemption Price of Series 2022 Bonds redeemed pursuant to Section 4.01(a) or Section 4.01(b) and for the payment of the Redemption Price of Additional Bonds redeemed under the Supplemental Indenture pursuant to which such Additional Bonds are issued (other than mandatory sinking fund redemptions thereof).

Section 5.06. Rebate Fund. (a) The Trustee shall establish and maintain a special fund designated the "Rebate Fund." There shall be deposited in the Rebate Fund such amounts as are required to be deposited therein pursuant to the Tax Certificate, as specified in a Written Request of the Community Facilities District. All money at any time deposited in the Rebate Fund shall be held by the Trustee in trust, to the extent required to satisfy the Rebate Requirement, for payment to the United States of America. Notwithstanding defeasance of the Bonds pursuant to Article X or anything to the contrary contained herein, all amounts required to be deposited into or on deposit in the Rebate Fund shall be governed exclusively by this Section and by the Tax Certificate, which is hereby incorporated herein as if fully set forth herein. The Trustee shall be deemed conclusively to have complied with such provisions if it follows the written directions of the Community Facilities District, and shall have no liability or responsibility to enforce compliance by the Community Facilities District with the terms of the Tax Certificate. The Trustee may conclusively rely upon the Community Facilities District's determinations, calculations and certifications required by the Tax Certificate. The Trustee shall have no responsibility to independently make any calculation or determination or to review the Community Facilities District's calculations.

(b) Any funds remaining in the Rebate Fund after payment in full of all of the Bonds and after payment of any amounts described in this Section, shall, upon receipt by the Trustee of a Written Request of the Community Facilities District, be withdrawn by the Trustee and remitted to the Community Facilities District.

Section 5.07. Administrative Expense Fund. (a) The Trustee shall establish and maintain a special fund designated the "Administrative Expense Fund." On the Closing Date, the Trustee shall deposit in the Administrative Expense Fund the amount specified in Section 3.02. The Trustee shall deposit in the Administrative Expense Fund the amounts transferred from the Special Tax Fund and required to be deposited therein pursuant to Section 5.02.

(b) The moneys in the Administrative Expense Fund shall be used and withdrawn by the Trustee from time to time to pay the Administrative Expenses upon submission of a Written Request of the Community Facilities District stating (i) the Person to whom payment is to be

made, (ii) the amount to be paid and instructions for such payment, (iii) the purpose for which the obligation was incurred and that such purpose constitutes an Administrative Expense, (iv) that such payment is a proper charge against the Administrative Expense Fund, and (v) that such amount has not been the subject of a prior disbursement from the Administrative Expense Fund, in each case together with a statement or invoice for each amount requested thereunder.

Section 5.08. Investment of Moneys. (a) Except as otherwise provided herein, all moneys in any of the funds or accounts established pursuant to this Indenture held by the Trustee shall be invested by the Trustee solely in Permitted Investments, as directed in a Written Request of the Community Facilities District received by the Trustee no later than two Business Days prior to the making of such investment. Moneys in all such funds and accounts shall be invested in Permitted Investments maturing not later than the date on which it is estimated that such moneys will be required for the purposes specified in this Indenture; provided, however, that Permitted Investments in which moneys in the Reserve Fund are so invested shall mature no later than the earlier of five years from the date of investment or the final maturity date of the Bonds and, provided, further, that if such Permitted Investments may be redeemed at par so as to be available on each Interest Payment Date, any amount in the Reserve Fund may be invested in such redeemable Permitted Investments maturing on any date on or prior to the final maturity date of the Bonds. Absent a timely Written Request of the Community Facilities District with respect to the investment of moneys in any of the funds or accounts established pursuant to this Indenture held by the Trustee, the Trustee shall invest such moneys in Permitted Investments described in paragraph (7) of the definition thereof; provided, however, that any such investment shall be made by the Trustee only if, prior to the date on which such investment is to be made, the Trustee shall have received a Written Request of the Community Facilities District specifying a specific money market fund that satisfies the requirements of said paragraph in which such investment is to be made and, if no such Written Request of the Community Facilities District is so received, the Trustee shall hold such moneys uninvested.

(b) Subject to the provisions of Section 5.06, all interest, profits and other income received from the investment of moneys in any fund or account established pursuant to this Indenture (other than the Reserve Fund) shall be retained therein. Subject to the provisions of Section 5.06, all interest, profits or other income received from the investment of moneys in the Reserve Fund shall, prior to the date on which a Written Certificate of the Community Facilities District is delivered to the Trustee pursuant to subsection (c) of Section 3.04, be transferred to the NMC Acquisition Account and, thereafter, shall be transferred to the Interest Account; provided, however, that, notwithstanding the foregoing, any such transfer shall be made from the Reserve Fund only if and to the extent that, after such transfer, the amount on deposit in the Reserve Fund is at least equal to the Reserve Requirement.

(c) Permitted Investments acquired as an investment of moneys in any fund or account established under this Indenture shall be credited to such fund or account. For the purpose of determining the amount in any fund or account, all Permitted Investments credited to such fund or account shall be valued by the Trustee at the market value thereof, such valuation to be performed not less frequently than semiannually on or before each February 15 and August 15. In determining the market value of Permitted Investments, the Trustee may use and rely upon generally recognized pricing information services, including brokers and dealers in securities, available to it.

(d) The Trustee may act as principal or agent in the making or disposing of any investment. Upon the Written Request of the Community Facilities District, the Trustee shall sell or present for redemption any Permitted Investments so purchased whenever it shall be necessary to provide moneys to meet any required payment, transfer, withdrawal or disbursement from the fund to which such Permitted Investments are credited, and the Trustee shall not be liable or responsible for any loss resulting from any investment made or sold pursuant to this Section. For purposes of investment, the Trustee may commingle moneys in any of the funds and accounts established hereunder. The Trustee, in making or disposing of any investment permitted by this Section, may deal with itself (in its individual capacity) or with any one or more of its affiliates, whether it or such affiliate is acting as an agent of the Trustee or for any third person or dealing as a principal for its own account but only if such dealing is not in conflict with, contrary to or in violation of any of the Trustee's fiduciary obligations as Trustee hereunder.

(e) The Community Facilities District acknowledges that to the extent regulations of the Comptroller of the Currency or other applicable regulatory entity grant the Community Facilities District the right to receive brokerage confirmations of security transactions as they occur, at no additional cost, the Community Facilities District specifically waives receipt of such confirmations to the extent permitted by law. The Trustee shall furnish the Community Facilities District periodic cash transaction statements, which shall include detail for all investment transactions made by the Trustee hereunder.

ARTICLE VI

COVENANTS

Section 6.01. Collection of Special Tax Revenues. (a) The Community Facilities District shall comply with all requirements of the Act so as to assure the timely collection of Special Tax Revenues, including the enforcement of delinquent Special Taxes.

(b) Prior to August 1 of each year, the Community Facilities District shall ascertain from the County Assessor the relevant parcels on which the Special Taxes are to be levied, taking into account any parcel splits during the preceding and then current year. The Community Facilities District shall effect the levy of the Special Taxes each Fiscal Year in accordance with the Ordinance by each August 10, or otherwise such that the computation of the levy is complete before the final date on which the County Auditor will accept the transmission of the Special Tax amounts for the parcels within the Community Facilities District for inclusion on the next real property tax roll. Upon the completion of the computation of the amounts of the levy, the Community Facilities District shall prepare or cause to be prepared, and shall transmit to the County Auditor, such data as the County Auditor requires in order to include the levy of the Special Taxes on the next real property tax roll.

(c) The Community Facilities District shall fix and levy the amount of Special Taxes within the Community Facilities District in each Fiscal Year in accordance with the Rate and Method and, subject to the limitations in the Rate and Method as to the maximum Special Taxes that may be levied, in an amount sufficient to yield Special Tax Revenues in the amount required for (i) the payment of principal of and interest on any Outstanding Bonds becoming due and payable during the Corresponding Bond Year, (ii) any necessary replenishment of the Reserve Fund, and (iii) the payment of Administrative Expenses estimated to be paid from such Special Tax Revenues, taking into account the balances in the funds and accounts established hereunder.

(d) The Special Taxes shall be payable and be collected in the same manner and at the same time and in the same installment as the general taxes on real property are payable (or in such other manner as the City Council shall determine, including direct billing of the affected property owners), and have the same priority, become delinquent at the same time and in the same proportionate amounts and bear the same proportionate penalties and interest after delinquency as do the *ad valorem* taxes on real property.

Section 6.02. Foreclosure. Pursuant to Section 53356.1 of the Act, the Community Facilities District hereby covenants with and for the benefit of the Owners that it will determine or cause to be determined, no later than August 15 of each year, whether or not any owners of property within the Community Facilities District are delinquent in the payment of Special Taxes and, if such delinquencies exist, the Community Facilities District will order and cause to be commenced no later than October 1, and thereafter diligently prosecute, an action in the superior court to foreclose the lien of any Special Taxes or installment thereof not paid when due; provided, however, that the Community Facilities District shall not be required to order the commencement of foreclosure proceedings if (a) the total Special Tax delinquency in the Community Facilities District for such Fiscal Year is less than 5% of the total Special Taxes levied in such Fiscal Year, and (b) the amount then on deposit in the Reserve Fund is equal to the

Reserve Requirement. Notwithstanding the foregoing, if the Community Facilities District determines that any single parcel in the Community Facilities District is delinquent in excess of $7,500 in the payment of the Special Taxes, then the Community Facilities District shall diligently institute, prosecute and pursue foreclosure proceedings against such parcel.

Section 6.03. Compliance with Act. The Community Facilities District shall comply with all applicable provisions of the Act.

Section 6.04. Punctual Payment. The Community Facilities District shall punctually pay or cause to be paid the principal, premium, if any, and interest to become due in respect of all the Bonds, in strict conformity with the terms of the Bonds and of this Indenture, according to the true intent and meaning thereof, but only out of Net Special Tax Revenues and other assets pledged for such payment as provided in this Indenture and received by the Community Facilities District or the Trustee.

Section 6.05. Extension of Payment of Bonds. The Community Facilities District shall not directly or indirectly extend or assent to the extension of the maturity of any of the Bonds or the time of payment of any claims for interest by the purchase of such Bonds or by any other arrangement, and in case the maturity of any of the Bonds or the time of payment of any such claims for interest shall be extended, such Bonds or claims for interest shall not be entitled, in case of any default hereunder, to the benefits of this Indenture, except subject to the prior payment in full of the principal of all of the Bonds then Outstanding and of all claims for interest thereon which shall not have been so extended. Nothing in this Section shall be deemed to limit the right of the Community Facilities District to issue Bonds for the purpose of refunding any Outstanding Bonds in accordance with the provisions hereof, and such issuance shall not be deemed to constitute an extension of maturity of the Bonds.

Section 6.06. Against Encumbrances; Defense of Pledge. The Community Facilities District shall not create, or permit the creation of, any pledge of, lien on, security interest in or charge or other encumbrance upon the assets pledged under this Indenture, except as permitted hereby. The Community Facilities District shall at all times, to the extent permitted by law, defend, preserve and protect said pledge of such assets, and the lien thereon and security interest therein created hereby, against all claims and demands of all Persons whomsoever.

Section 6.07. Tax Covenants. (a) The Community Facilities District shall not take any action, or fail to take any action, if such action or failure to take such action would adversely affect the exclusion from gross income of interest on the Series 2022 Bonds under Section 103 of the Code. Without limiting the generality of the foregoing, the Community Facilities District shall comply with the requirements of the Tax Certificate, which is incorporated herein as if fully set forth herein. This covenant shall survive payment in full or defeasance of the Series 2022 Bonds.

(b) In the event that at any time the Community Facilities District is of the opinion that for purposes of this Section it is necessary or helpful to restrict or limit the yield on the investment of any moneys held by the Trustee in any of the funds or accounts established hereunder, the Community Facilities District shall so instruct the Trustee in writing, and the Trustee shall take such action as may be necessary in accordance with such instructions.

(c) Notwithstanding any provisions of this Section, if the Community Facilities District shall provide to the Trustee an opinion of Bond Counsel to the effect that any specified action required under this Section is no longer required or that some further or different action is required to maintain the exclusion from federal income tax of interest on the Series 2022 Bonds, the Trustee may conclusively rely on such opinion in complying with the requirements of this Section and of the Tax Certificate, and the covenants hereunder shall be deemed to be modified to that extent.

Section 6.08. Non-Cash Payments of Special Taxes. The Community Facilities District shall not authorize owners of taxable parcels within the Community Facilities District to satisfy Special Tax obligations by the tender of Bonds unless the Community Facilities District shall have first obtained a report of an Independent Consultant certifying that doing so would not result in the Community Facilities District having insufficient Special Tax Revenues to pay the principal of and interest on all Outstanding Bonds when due.

Section 6.09. Reduction in Special Taxes. The Community Facilities District shall not initiate proceedings under the Act to modify the Rate and Method if such modification would adversely affect the security for the Bonds. If an initiative is adopted that purports to modify the Rate and Method in a manner that would adversely affect the security for the Bonds, the Community Facilities District shall, to the extent permitted by law, commence and pursue reasonable legal actions to prevent the modification of the Rate and Method in a manner that would adversely affect the security for the Bonds.

Section 6.10. Continuing Disclosure. Each of the Community Facilities District and the Trustee shall comply with and carry out all of the provisions of the Continuing Disclosure Agreement applicable to it. Notwithstanding any other provision of this Indenture, failure of the Community Facilities District or the Trustee to comply with the Continuing Disclosure Agreement shall not be considered an Event of Default; provided, however, that the Trustee may (and, at the written direction of any Participating Underwriter or the Owners of at least 25% aggregate principal amount of Outstanding Series 2022 Bonds, and upon receipt of indemnification reasonably satisfactory to the Trustee, shall) or any Owner or Beneficial Owner of the Series 2022 Bonds may, take such actions as may be necessary and appropriate to compel performance, including seeking mandate or specific performance by court order.

Section 6.11. Accounting Records. The Community Facilities District shall keep or cause to be kept appropriate accounting records in which complete and correct entries shall be made of all transactions relating to the Special Taxes, which records shall be available for inspection by the Trustee at reasonable hours and under reasonable conditions.

Section 6.12. State Reporting. If at any time principal or interest due on any scheduled payment date for the Bonds is not paid, or if funds are withdrawn from the Reserve Fund to pay principal of or interest on the Bonds, the Trustee shall notify the Community Facilities District in writing of such failure or withdrawal, and the Community Facilities District shall notify the California Debt and Investment Advisory Commission of such failure or withdrawal within ten days of the failure to make such payment or the date of such withdrawal.

Section 6.13. Annual Reports to the California Debt and Investment Advisory Commission. Not later than October 30 of each year, commencing October 30, 2023 and continuing until the October 30 following the final maturity of the Bonds, the Community Facilities District shall supply to the California Debt and Investment Advisory Commission the information required to be provided thereto pursuant to Section 53359.5(b) of the Act. Such information shall be made available to any Owner upon written request to the Community Facilities District accompanied by a fee determined by the Community Facilities District to pay the costs of the Community Facilities District in connection therewith. The Community Facilities District shall in no event be liable to any Owner or any other person or entity in connection with any error in any such information.

Section 6.14. Further Assurances. The Community Facilities District shall make, execute and deliver any and all such further agreements, instruments and assurances as may be reasonably necessary or proper to carry out the intention or to facilitate the performance of this Indenture and for the better assuring and confirming unto the Owners of the rights and benefits provided in this Indenture.

ARTICLE VII

EVENTS OF DEFAULT AND REMEDIES

Section 7.01. Events of Default. The following events shall be Events of Default:

(a) failure to pay any installment of principal of any Bonds when and as the same shall become due and payable, whether at maturity as therein expressed, by proceedings for redemption or otherwise;

(b) failure to pay any installment of interest on any Bonds when and as the same shall become due and payable;

(c) failure by the Community Facilities District to observe and perform any of the other covenants, agreements or conditions on its part in this Indenture or in the Bonds contained, if such failure shall have continued for a period of 30 days after written notice thereof, specifying such failure and requiring the same to be remedied, shall have been given to the Community Facilities District by the Trustee, or to the Community Facilities District and the Trustee by the Owners of not less than 5% in aggregate principal amount of the Bonds at the time Outstanding; provided, however, that, if in the reasonable opinion of the Community Facilities District the failure stated in the notice can be corrected, but not within such 30 day period, such failure shall not constitute an Event of Default if corrective action is instituted by the Community Facilities District within such 30 day period and the Community Facilities District shall thereafter diligently and in good faith cure such failure in a reasonable period of time, provided, further, that, unless otherwise consented to by the Trustee, such period of time shall not exceed 180 days; or

(d) the commencement by the Community Facilities District of a voluntary case under Title 11 of the United States Code or any substitute or successor statute.

Section 7.02. Foreclosure. If an Event of Default shall occur under Section 7.01(a) or Section 7.01(b) then, and in each and every such case during the continuance of such Event of Default, the Trustee may, or at the written direction of the Owners of not less than a majority in aggregate principal amount of the Bonds at the time Outstanding, and upon being indemnified to its satisfaction therefor, shall, commence foreclosure against any parcels of land in the Community Facilities District with delinquent Special Taxes, as provided in Section 53356.1 of the Act; provided, however, that the Trustee shall not be required to pursue a foreclosure action against any such parcel if the Trustee would be required to take title to, or an ownership interest in, such parcel in connection with or as a result of such foreclosure action.

Section 7.03. Other Remedies. If an Event of Default shall have occurred and be continuing, the Trustee shall have the right:

(a) by mandamus, suit, action or proceeding, to compel the Community Facilities District and its officers, agents or employees to perform each and every term, provision and covenant contained in this Indenture and in the Bonds, and to require the carrying out of any or all such covenants and agreements of the Community Facilities District and the fulfillment of all duties imposed upon it by this Indenture and the Act;

(b) by suit, action or proceeding in equity, to enjoin any acts or things which are unlawful, or the violation of any of the rights of the Trustee or the Owners; or

(c) by suit, action or proceeding in any court of competent jurisdiction, to require the Community Facilities District and its officers and employees to account as if it and they were the trustees of an express trust.

Section 7.04. Remedies Not Exclusive. No remedy herein conferred upon or reserved to the Trustee or to the Owners is intended to be exclusive of any other remedy or remedies, and each and every such remedy, to the extent permitted by law, shall be cumulative and in addition to any other remedy given hereunder or now or hereafter existing at law or in equity or otherwise.

Section 7.05. Application of Net Special Tax Revenues After Default. If an Event of Default shall occur and be continuing, all Net Special Tax Revenues and any other funds thereafter received by the Trustee under any of the provisions of this Indenture shall be applied by the Trustee as follows and in the following order:

(a) to the payment of any expenses incurred by the Trustee necessary in the opinion of the Trustee to protect the interests of the Owners and payment of reasonable fees, charges and expenses of the Trustee (including reasonable fees and disbursements of its counsel) incurred in and about the performance of its powers and duties under this Indenture;

(b) to the payment of the principal and interest then due with respect to the Bonds (upon presentation of the Bonds to be paid, and stamping thereon of the payment if only partially paid, or surrender thereof if fully paid) subject to the provisions of this Indenture, as follows:

First: to the payment to the Persons entitled thereto of all installments of interest on the Bonds then due in the order of the maturity of such installments and, if the amount available shall not be sufficient to pay in full any installment or installments maturing on the same date, then to the payment thereof ratably, according to the amounts due thereon, to the Persons entitled thereto, without any discrimination or preference; and

Second: to the payment to the Persons entitled thereto of all installments of principal of the Bonds then due, whether at maturity or by call for redemption, with interest on the overdue principal at the rate borne by the respective Bonds on the date of maturity or redemption, and, if the amount available shall not be sufficient to pay in full all the Bonds, together with such interest, then to the payment thereof ratably, according to the amounts of principal due on such date to the Persons entitled thereto, without any discrimination or preference;

(c) any remaining funds shall be transferred by the Trustee to the Special Tax Fund.

Section 7.06. Power of Trustee to Enforce. All rights of action under this Indenture or the Bonds or otherwise may be prosecuted and enforced by the Trustee without the possession of any of the Bonds or the production thereof in any proceeding relating thereto, and any such suit, action or proceeding instituted by the Trustee shall be brought in the name of the Trustee for the benefit and protection of the Owners of such Bonds, subject to the provisions of this Indenture. Nothing herein shall be deemed to authorize the Trustee to authorize or consent to or accept or adopt on behalf of any Owner any plan of reorganization, arrangement, adjustment, or composition affecting the Bonds or the rights of any Owner thereof, or to authorize the Trustee to vote in respect of the claim of any Owner in any such proceeding without the approval of the Owners so affected.

Section 7.07. Owners' Direction of Proceedings. Anything in this Indenture to the contrary notwithstanding, the Owners of a majority in aggregate principal amount of the Bonds then Outstanding shall have the right, by an instrument or concurrent instruments in writing executed and delivered to the Trustee, and upon indemnification of the Trustee to its reasonable satisfaction, to direct the method of conducting all remedial proceedings taken by the Trustee hereunder; provided, however, that such direction shall not be otherwise than in accordance with the provisions of this Indenture, the Act and other applicable law and, provided, further, that the Trustee shall have the right to decline to follow any such direction which in the opinion of the Trustee would be unjustly prejudicial to Owners not parties to such direction.

Section 7.08. Limitation on Owners' Right to Sue. No Owner of any Bond shall have the right to institute any suit, action or proceeding at law or in equity, for the protection or enforcement of any right or remedy under this Indenture, the Act or any other applicable law with respect to such Bond, unless (a) such Owner shall have given to the Trustee written notice of the occurrence of an Event of Default, (b) the Owners of a majority in aggregate principal amount of the Bonds then Outstanding shall have made written request upon the Trustee to exercise the powers hereinbefore granted or to institute such suit, action or proceeding in its own name, (c) such Owner or said Owners shall have tendered to the Trustee indemnity reasonably satisfactory to the Trustee against the costs, expenses and liabilities to be incurred in compliance with such request, and (d) the Trustee shall have refused or omitted to comply with such request for a period of 60 days after such written request shall have been received by, and said tender of indemnity shall have been made to, the Trustee.

Such notification, request, tender of indemnity and refusal or omission are hereby declared, in every case, to be conditions precedent to the exercise by any Owner of any remedy hereunder or under law; it being understood and intended that no one or more Owners shall have any right in any manner whatever by such Owner's or Owners' action to affect, disturb or prejudice the security of this Indenture or the rights of any other Owners, or to enforce any right under the Bonds, this Indenture, the Act or other applicable law with respect to the Bonds, except in the manner herein provided, and that all proceedings at law or in equity to enforce any such right shall be instituted, had and maintained in the manner herein provided and for the benefit and protection of all Owners, subject to the provisions of this Indenture.

Section 7.09. Absolute Obligation. Nothing in this Indenture or the Bonds contained shall affect or impair the obligation of the Community Facilities District, which is absolute and unconditional, to pay the principal of and interest on the Bonds to the respective Owners as the

same become due, as herein provided, but only out of the Net Special Tax Revenues and other assets pledged therefor hereunder, or affect or impair the right of such Owners, which is also absolute and unconditional, to enforce such payment by virtue of the contract embodied in the Bonds.

Section 7.10. Termination of Proceedings. In case any proceedings taken by the Trustee or any one or more Owners on account of any Event of Default shall have been discontinued or abandoned for any reason or shall have been determined adversely to the Trustee or the Owners, then in every such case the Community Facilities District, the Trustee and the Owners, subject to any determination in such proceedings, shall be restored to their former positions and rights hereunder, severally and respectively, and all rights, remedies, powers and duties of the Community Facilities District, the Trustee and the Owners shall continue as though no such proceedings had been taken.

Section 7.11. No Waiver of Default. No delay or omission of the Trustee or of any Owner to exercise any right or power arising upon the occurrence of any default or Event of Default shall impair any such right or power or shall be construed to be a waiver of any such default or Event of Default or an acquiescence therein, and every power and remedy given by this Indenture to the Trustee or to the Owners may be exercised from time to time and as often as may be deemed expedient.

ARTICLE VIII

TRUSTEE

Section 8.01. Duties and Liabilities of Trustee. The Trustee shall, prior to an Event of Default, and after the curing or waiver of all Events of Default which may have occurred, perform such duties and only such duties as are expressly and specifically set forth in this Indenture. The Trustee shall, during the existence of any Event of Default which has not been cured or waived, exercise such of the rights and powers vested in it by this Indenture, and use the same degree of care and skill in their exercise, as a prudent person would exercise or use under the circumstances in the conduct of such person's own affairs.

Section 8.02. Qualifications; Removal and Resignation; Successors. (a) The Trustee initially a party hereto and any successor thereto shall at all times be a trust company, national banking association or bank having trust powers in good standing in or incorporated under the laws of the United States or any state thereof, which is (or if such trust company, national banking association or bank is a member of a bank holding company system, its parent bank holding company is) (i) a national banking association that is supervised by the Office of the Comptroller of the Currency and has at least $250 million of assets, or (ii) a state-chartered commercial bank that is a member of the Federal Reserve System and has at least $1 billion of assets. If such trust company, national banking association or bank publishes a report of condition at least annually, pursuant to law or to the requirements of any supervising or examining agency above referred to, then for the purpose of this subsection the combined capital and surplus of such trust company, national banking association or bank shall be deemed to be its combined capital and surplus as set forth in its most recent report of condition so published.

(b) The Community Facilities District may, by an instrument in writing, upon at least 30 days' notice to the Trustee, remove the Trustee initially a party hereto and any successor thereto unless an Event of Default shall have occurred and then be continuing, and shall remove the Trustee initially a party hereto and any successor thereto if (i) at any time requested to do so by an instrument or concurrent instruments in writing signed by the Owners of not less than a majority in aggregate principal amount of the Bonds then Outstanding (or their attorneys duly authorized in writing), or (ii) the Trustee shall cease to be eligible in accordance with subsection (a) of this Section, or shall become incapable of acting, or shall be adjudged a bankrupt or insolvent, or a receiver of the Trustee or its property shall be appointed, or any public officer shall take control or charge of the Trustee or of its property or affairs for the purpose of rehabilitation, conservation or liquidation, in each case by giving written notice of such removal to the Trustee.

(c) The Trustee may at any time resign by giving written notice of such resignation by first class mail, postage prepaid, to the Community Facilities District, and to the Owners at the respective addresses shown on the Registration Books. In case at any time the Trustee shall cease to be eligible in accordance with the provisions of subsection (a) of this Section, the Trustee shall resign immediately in the manner and with the effect specified in this Section.

(d) Upon removal or resignation of the Trustee, the Community Facilities District shall promptly appoint a successor Trustee by an instrument in writing. Any removal or

resignation of the Trustee and appointment of a successor Trustee shall become effective upon acceptance of appointment by the successor Trustee; provided, however, that any successor Trustee shall be qualified as provided in subsection (a) of this Section. If no qualified successor Trustee shall have been appointed and have accepted appointment within 45 days following notice of removal or notice of resignation as aforesaid, the removed or resigning Trustee or any Owner (on behalf of such Owner and all other Owners) may petition any court of competent jurisdiction for the appointment of a successor Trustee, and such court may thereupon, after such notice, if any, as it may deem proper, appoint such successor Trustee. Any successor Trustee appointed under this Indenture shall signify its acceptance of such appointment by executing and delivering to the Community Facilities District and to its predecessor Trustee a written acceptance thereof, and thereupon such successor Trustee, without any further act, deed or conveyance, shall become vested with all the moneys, estates, properties, rights, powers, trusts, duties and obligations of such predecessor Trustee, with like effect as if originally named Trustee herein; but, nevertheless at the Written Request of the Community Facilities District or the request of the successor Trustee, such predecessor Trustee shall execute and deliver any and all instruments of conveyance or further assurance and do such other things as may reasonably be required for more fully and certainly vesting in and confirming to such successor Trustee all the right, title and interest of such predecessor Trustee in and to any property held by it under this Indenture and shall pay over, transfer, assign and deliver to the successor Trustee any money or other property subject to the trusts and conditions herein set forth. Upon acceptance of appointment by a successor Trustee as provided in this subsection, the successor Trustee shall, within 15 days after such acceptance, mail, by first class mail postage prepaid, a notice of the succession of such Trustee to the trusts hereunder to the Owners at the addresses shown on the Registration Books.

(e) Any trust company, national banking association or bank into which the Trustee may be merged or converted or with which it may be consolidated or any trust company, national banking association or bank resulting from any merger, conversion or consolidation to which it shall be a party or any trust company, national banking association or bank to which the Trustee may sell or transfer all or substantially all of its corporate trust business, provided such trust company, national banking association or bank shall be eligible under subsection (a) of this Section, shall be the successor to such Trustee, without the execution or filing of any paper or any further act, anything herein to the contrary notwithstanding.

Section 8.03. Liability of Trustee. (a) The recitals of facts herein and in the Bonds contained shall be taken as statements of the Community Facilities District, and the Trustee shall not assume responsibility for the correctness of the same or incur any responsibility in respect thereof, other than as expressly stated herein in connection with the respective duties or obligations herein or in the Bonds assigned to or imposed upon it. The Trustee shall, however, be responsible for its representations contained in its certificate of authentication on the Bonds.

(b) The Trustee makes no representations as to the validity or sufficiency of this Indenture or of any Bonds, or in respect of the security afforded by this Indenture and the Trustee shall incur no responsibility in respect thereof. The Trustee shall be under no responsibility or duty with respect to the issuance of the Bonds for value, the application of the proceeds thereof except to the extent that such proceeds are received by it in its capacity as Trustee, or the

application of any moneys paid to the Community Facilities District or others in accordance with this Indenture.

(c) The Trustee shall not be liable in connection with the performance of its duties hereunder, except for its own negligence or willful misconduct.

(d) No provision of this Indenture or any other document related hereto shall require the Trustee to risk or advance its own funds.

(e) The Trustee may execute any of its powers or duties hereunder through attorneys, agents or receivers and shall not be answerable for the actions of such attorneys, agents or receivers if selected by it with reasonable care.

(f) The Trustee shall not be liable for any error of judgment made in good faith by a responsible officer, unless it shall be proved that the Trustee was negligent in ascertaining the pertinent facts.

(g) The immunities and protections extended to the Trustee also extend to its directors, officers, employees and agents.

(h) Before taking action under Article VII, under this Article or upon the direction of the Owners, the Trustee may require indemnity reasonably satisfactory to the Trustee be furnished to it to protect it against all fees and expenses, including those of its attorneys and advisors, and protect it against all liability it may incur.

(i) The Trustee shall not be liable with respect to any action taken or omitted to be taken by it in good faith in accordance with the direction of the Owners of not less than a majority in aggregate principal amount of the Bonds at the time Outstanding relating to the time, method and place of conducting any proceeding for any remedy available to the Trustee, or exercising any trust or power conferred upon the Trustee under this Indenture.

(j) The Trustee may become the Owner of Bonds with the same rights it would have if it were not Trustee and, to the extent permitted by law, may act as depository for and permit any of its officers or directors to act as a member of, or in any other capacity with respect to, any committee formed to protect the rights of Owners, whether or not such committee shall represent the Owners of a majority in aggregate principal amount of the Bonds then Outstanding.

(k) The Trustee shall have no responsibility with respect to any information, statement, or recital in any official statement, offering memorandum or any other disclosure material prepared or distributed with respect to the Bonds.

(l) The Trustee shall not be liable for the failure to take any action required to be taken by it hereunder if and to the extent that the Trustee's taking such action is prevented by reason of an act of God, terrorism, war, riot, strike, fire, flood, earthquake, epidemic or other, similar occurrence that is beyond the control of the Trustee and could not have been avoided by exercising due care.

(m) The Trustee shall not be deemed to have knowledge of an Event of Default hereunder unless it has actual knowledge thereof.

(n) The permissive right of the Trustee to do things enumerated in this Indenture shall not be construed as a duty and it shall not be answerable for other than its negligence or willful misconduct.

(o) The Trustee shall not be responsible for or accountable to anyone for the subsequent use or application of any moneys which shall be released or withdrawn in accordance with the provisions hereof.

Section 8.04. Right to Rely on Documents and Opinions. (a) The Trustee shall be protected in acting upon any notice, resolution, request, requisition, facsimile, consent, order, certificate, report, opinion, bond or other paper or document believed by it to be genuine and to have been signed or presented by the proper party or parties. Each statement of facts contained in a Written Request of the Community Facilities District or a Written Certificate of the Community Facilities District shall be sufficient evidence to the Trustee of the facts so stated and the Trustee shall have no duty to confirm the accuracy of such facts.

(b) The Trustee shall have the right to accept and act upon a Written Request of the Community Facilities District delivered using Electronic Means. If the Community Facilities District elects to deliver a Written Request of the Community Facilities District to the Trustee using Electronic Means and the Trustee acts upon such Written Request, the Trustee's understanding of such Written Request shall be deemed controlling. The Community Facilities District understands and agrees that the Trustee cannot determine the identity of the actual sender of such Written Request and that the Trustee shall conclusively presume that Written Requests of the Community Facilities District that purport to have been sent by an Authorized Representative of the Community Facilities District have been sent by such Authorized Representative. The Community Facilities District shall be responsible for ensuring that only Authorized Representatives transmit such Written Requests of the Community Facilities District to the Trustee and that the Community Facilities District is solely responsible to safeguard the use and confidentiality of applicable user and authorization codes, passwords and/or authentication keys upon receipt thereof by the Community Facilities District. The Trustee shall not be liable for any losses, costs or expenses arising directly or indirectly from the Trustee's reliance upon and compliance with such Written Requests of the Community Facilities District delivered using Electronic Means notwithstanding such directions conflict or are inconsistent with a subsequent written Written Requests of the Community Facilities District. The Community Facilities District agrees (i) to assume all risks arising out of the use of Electronic Means to submit Written Requests of the Community Facilities District to the Trustee, including the risk of the Trustee acting on unauthorized Written Requests of the Community Facilities District, and the risk of interception and misuse by third parties, (ii) that it is fully informed of the protections and risks associated with the various methods of transmitting Written Requests of the Community Facilities District to the Trustee and that there may be more secure methods of transmitting Written Requests of the Community Facilities District than the method selected by the Community Facilities District, (iii) that the security procedures, if any, to be followed in connection with its transmission of Written Requests of the Community Facilities District provide to it a commercially reasonable degree of protection in light of its particular needs and

circumstances, and (iv) to notify the Trustee immediately upon learning of any compromise or unauthorized use of the security procedures. Notwithstanding the foregoing, the provisions of this subsection, and the Trustee's actions pursuant hereto, are subject to the Trustee's standard of care and limitations on liability set forth in Sections 8.03 and 8.04; provided, however, that the Trustee's reliance on a Written Request of the Community Facilities District that purports to have been sent by an Authorized Representative of the Community Facilities District delivered in accordance with this Section using Electronic Means shall not, in and of itself, be construed as negligence.

(c) Whenever in the administration of the duties imposed upon it by this Indenture the Trustee shall deem it necessary or desirable that a matter be proved or established prior to taking or suffering any action hereunder, such matter (unless other evidence in respect thereof be herein specifically prescribed) may be deemed to be conclusively proved and established by a Written Certificate of the Community Facilities District, and such Written Certificate shall be full warrant to the Trustee for any action taken or suffered in good faith under the provisions of this Indenture in reliance upon such Written Certificate, but in its discretion the Trustee may, in lieu thereof, accept other evidence of such matter or may require such additional evidence as it may deem reasonable.

(d) The Trustee may consult with counsel, who may be counsel to the Community Facilities District, with regard to legal questions, including with respect to compliance herewith of amendments hereto, and the opinion of such counsel shall be full and complete authorization and protection in respect of any action taken or suffered by it hereunder in good faith and in accordance therewith.

Section 8.05. Accounting Records and Financial Statements. The Trustee shall at all times keep, or cause to be kept, proper books of record and account, prepared in accordance with prudent corporate trust industry standards, in which accurate entries shall be made of all transactions made by it relating to the proceeds of the Bonds, the Special Tax Revenues received by it and all funds and accounts established by it pursuant to this Indenture. Such books of record and account shall be available for inspection by the Community Facilities District during regular business hours and upon reasonable notice and under reasonable circumstances as agreed to by the Trustee. The Trustee shall deliver to the Community Facilities District a monthly accounting of the funds and accounts it holds under this Indenture; provided, however, that the Trustee shall not be obligated to deliver an accounting for any fund or account that (a) has a balance of zero, and (b) has not had any activity since the last reporting date.

Section 8.06. Preservation and Inspection of Documents. All documents received by the Trustee under the provisions of this Indenture shall be retained in its possession and shall be subject during business hours and upon reasonable notice to the inspection of the Community Facilities District, the Owners and their agents and representatives duly authorized in writing.

Section 8.07. Compensation and Indemnification. The Community Facilities District shall pay to the Trustee from time to time from Special Tax Revenues all reasonable compensation pursuant to a pre-approved fee letter for all services rendered under this Indenture, and also all reasonable expenses, charges, legal and consulting fees pursuant to a pre-approved fee letter and other disbursements pursuant to a pre-approved fee letter and those of its attorneys,

agents and employees, incurred in and about the performance of their powers and duties under this Indenture. The Community Facilities District shall, to the extent permitted by law, from Special Tax Revenues, indemnify and save the Trustee and its officers, directors and employees harmless against any costs, suits, judgments, damages, liabilities, claims, expenses, including legal fees and expenses, and liabilities which it may incur in the exercise and performance of its powers and duties hereunder, including the enforcement of any remedies and the defense of any suit, and which are not due to its negligence or its willful misconduct. The duty of the Community Facilities District to indemnify the Trustee shall survive the resignation or removal of the Trustee and the discharge and satisfaction of this Indenture.

ARTICLE IX

SUPPLEMENTAL INDENTURES

Section 9.01. Supplemental Indentures. (a) This Indenture and the rights and obligations of the Community Facilities District, the Trustee and the Owners hereunder may be modified or amended from time to time and at any time by a Supplemental Indenture, which the Community Facilities District and the Trustee may enter into when there are filed with the Trustee the written consents of the Owners of a majority of the aggregate principal amount of the Bonds then Outstanding, exclusive of Bonds disqualified as provided in Section 11.07. No such modification or amendment shall (i) extend the fixed maturity of any Bond, reduce the amount of principal thereof or the rate of interest thereon, extend the time of payment thereof or alter the redemption provisions thereof, without the prior written consent of the Owner of each Bond so affected, (ii) permit any pledge of, or the creation of any lien on, security interest in or charge or other encumbrance upon the assets pledged under this Indenture prior to or on a parity with the pledge contained in, and the lien and security interest created by, this Indenture or deprive the Owners of the pledge contained in, and the lien and security interest created by, this Indenture, except as expressly provided in this Indenture, without the prior written consents of the Owners of all Bonds then Outstanding, or (iii) modify or amend this Section without the prior written consents of the Owners of all Bonds then Outstanding.

(b) This Indenture and the rights and obligations of the Community Facilities District, the Trustee and the Owners hereunder may also be modified or amended from time to time and at any time by a Supplemental Indenture, which the Community Facilities District and the Trustee may enter into without the consent of any Owners for any one or more of the following purposes:

(i) to add to the covenants and agreements of the Community Facilities District in this Indenture contained, other covenants and agreements thereafter to be observed, to pledge or assign additional security for the Bonds (or any portion thereof), or to surrender any right or power herein reserved to or conferred upon the Community Facilities District;

(ii) to make such provisions for the purpose of curing any ambiguity, inconsistency or omission, or of curing or correcting any defective provision contained in this Indenture, provided that such modification or amendment does not materially adversely affect the rights or interests of the Owners hereunder;

(iii) to provide for the issuance of one or more Series of Additional Bonds, and to provide the terms and conditions under which such Series of Additional Bonds may be issued, subject to and in accordance with the provisions of Article III;

(iv) to permit the qualification of this Indenture under the Trust Indenture Act of 1939, as amended, or any similar federal statute hereafter in effect;

(v) to cause interest on the Bonds to be excludable from gross income for purposes of federal income taxation by the United States of America; and

(vi) in any other respect whatsoever as the Community Facilities District may deem necessary or desirable, provided that such modification or amendment does not materially adversely affect the rights or interests of the Owners hereunder.

(c) Promptly after the execution by the Community Facilities District and the Trustee of any Supplemental Indenture, the Trustee shall mail a notice (the form of which shall be furnished to the Trustee by the Community Facilities District), by first class mail postage prepaid, setting forth in general terms the substance of such Supplemental Indenture, to the Owners at the respective addresses shown on the Registration Books. Any failure to give such notice, or any defect therein, shall not, however, in any way impair or affect the validity of any such Supplemental Indenture.

Section 9.02. Effect of Supplemental Indenture. Upon the execution of any Supplemental Indenture pursuant to this Article, this Indenture shall be deemed to be modified and amended in accordance therewith, and the respective rights, duties and obligations under this Indenture of the Community Facilities District, the Trustee and the Owners shall thereafter be determined, exercised and enforced hereunder subject in all respects to such modification and amendment, and all the terms and conditions of any such Supplemental Indenture shall be deemed to be part of the terms and conditions of this Indenture for any and all purposes.

Section 9.03. Endorsement of Bonds; Preparation of New Bonds. Bonds delivered after the effective date of any Supplemental Indenture pursuant to this Article may and, if the Community Facilities District so determines, shall bear a notation by endorsement or otherwise in form approved by the Community Facilities District and the Trustee as to any modification or amendment provided for in such Supplemental Indenture, and, in that case, upon demand of the Owner of any Bond Outstanding at the time of such effective date and presentation of such Bond for such purpose at the Office of the Trustee a suitable notation shall be made on such Bonds. If the Supplemental Indenture shall so provide, new Bonds so modified as to conform, in the opinion of the Community Facilities District and the Trustee, to any modification or amendment contained in such Supplemental Indenture, shall be prepared and executed by the Community Facilities District and authenticated by the Trustee and, in that case, upon demand of the Owner of any Bond Outstanding at the time of such effective date, and presentation of such Bond for such purpose at the Office of the Trustee, such a new Bond in equal principal amount of the same Series, interest rate and maturity shall be exchanged for such Owner's Bond so surrendered.

Section 9.04. Amendment of Particular Bonds. The provisions of this Article shall not prevent any Owner from accepting any amendment or modification as to any particular Bond owned by it, provided that due notation thereof is made on such Bond.

ARTICLE X

DEFEASANCE

Section 10.01. Discharge of Indenture. (a) If the Community Facilities District shall pay or cause to be paid or there shall otherwise be paid to the Owners of all Outstanding Bonds the principal thereof and the interest and premium, if any, thereon at the times and in the manner stipulated herein and therein, then the Owners shall cease to be entitled to the pledge of the Net Special Tax Revenues and the other assets pledged therefor hereunder, and all agreements, covenants and other obligations of the Community Facilities District hereunder shall thereupon cease, terminate and become void and this Indenture shall be discharged and satisfied. In such event, the Trustee shall execute and deliver to the Community Facilities District all such instruments as may be necessary or desirable to evidence such discharge and satisfaction, and the Trustee shall pay over or deliver to the Community Facilities District all money or securities held by it pursuant hereto that are not required for the payment of the principal of and interest and premium, if any, on the Bonds.

(b) Subject to the provisions of subsection (a) of this Section, if the Community Facilities District shall pay or cause to be paid to the Owner of an Outstanding Bond the principal thereof and the interest and premium, if any, thereon at the times and in the manner stipulated herein and therein, such Owner shall cease to be entitled to the pledge of the Net Special Tax Revenues and the other assets pledged therefor hereunder and all agreements, covenants and other obligations of the Community Facilities District hereunder shall thereupon cease, terminate and become void and this Indenture shall be discharged and satisfied as to such Bond.

(c) Notwithstanding the discharge and satisfaction of this Indenture or the discharge and satisfaction of this Indenture in respect of any Bond, those provisions of this Indenture relating to the maturity of the Bonds, interest payments and dates thereof, exchange and transfer of Bonds, replacement of mutilated, destroyed, lost or stolen Bonds, the safekeeping and cancellation of Bonds, non-presentment of Bonds, and the duties of the Trustee in connection with all of the foregoing, shall remain in effect and shall be binding upon the Trustee and the Owner of such Bond, and the Trustee shall continue to be obligated to hold in trust any moneys or investments then held by the Trustee for the payment of the principal of and interest and premium, if any, on such Bond, and to pay to the Owner of such Bond the funds so held by the Trustee as and when such payment becomes due. Notwithstanding the discharge and satisfaction of this Indenture, the obligation of the Community Facilities District to indemnify the Trustee pursuant to Section 8.07 shall remain in effect and be binding upon the Community Facilities District.

Section 10.02. Bonds Deemed To Have Been Paid. (a) If moneys shall have been set aside and held by the Trustee for the payment or redemption of any Bond and the payment of the interest thereon to the maturity or redemption date thereof, such Bond shall be deemed to have been paid within the meaning and with the effect provided in Section 10.01. Any Outstanding Bond shall prior to the maturity date or redemption date thereof be deemed to have been paid within the meaning of and with the effect expressed in Section 10.01 if (i) in case such Bond is to be redeemed on any date prior to its maturity date, the Community Facilities District shall have

given to the Trustee in form satisfactory to it irrevocable instructions to mail, on a date in accordance with the provisions of Section 4.02, notice of redemption of such Bond on said redemption date, said notice to be given in accordance with Section 4.02, (ii) there shall have been deposited with the Trustee either (A) money in an amount which shall be sufficient, or (B) Defeasance Securities, the principal of and the interest on which when due, and without any reinvestment thereof, together with the money, if any, deposited therewith, will provide moneys which shall be sufficient to pay when due the interest to become due on such Bond on and prior to the maturity date or redemption date thereof, as the case may be, and the principal of and premium, if any, on such Bond, and (iii) in the event such Bond is not by its terms subject to redemption within the next succeeding 60 days, the Community Facilities District shall have given the Trustee in form satisfactory to it irrevocable instructions to mail as soon as practicable, a notice to the Owner of such Bond that the deposit required by clause (ii) above has been made with the Trustee and that such Bond is deemed to have been paid in accordance with this Section and stating the maturity date or redemption date upon which money is to be available for the payment of the principal of and premium, if any, on such Bond.

(b) No Bond shall be deemed to have been paid pursuant to clause (ii) of subsection (a) of this Section unless the Community Facilities District shall have caused to be delivered to the Community Facilities District and the Trustee (i) an executed copy of a Verification Report with respect to such deemed payment, addressed to the Community Facilities District and the Trustee, in form and in substance acceptable to the Community Facilities District, (ii) a copy of the escrow agreement entered into in connection with the deposit pursuant to clause (ii)(B) of subsection (a) of this Section resulting in such deemed payment, which escrow agreement shall be in form and in substance acceptable to the Community Facilities District and which escrow agreement shall provide that no substitution of Defeasance Securities shall be permitted except with other Defeasance Securities and upon delivery of a new Verification Report, and no reinvestment of Defeasance Securities shall be permitted except as contemplated by the original Verification Report or upon delivery of a new Verification Report, and (iii) a copy of an opinion of Bond Counsel, dated the date of such deemed payment and addressed to the Community Facilities District and the Trustee, in form and in substance acceptable to the Community Facilities District, to the effect that such Bond has been paid within the meaning and with the effect expressed in this Indenture, all agreements, covenants and other obligations of the Community Facilities District hereunder have ceased, terminated and become void and the Indenture has been discharged and satisfied as to such Bonds.

Section 10.03. Unclaimed Moneys. Any moneys held by the Trustee in trust for the payment of the principal of, or premium or interest on, any Bond that remain unclaimed for two years after the date when such principal, premium or interest has become payable, if such moneys were held by the Trustee at such date, or for two years after the date of deposit of such moneys if deposited with the Trustee after the date when such principal, premium or interest become payable, shall be repaid by the Trustee to the Community Facilities District as its absolute property free from trust, and the Trustee shall thereupon be released and discharged with respect thereto and the Owner of such Bond shall look only to the Community Facilities District for the payment of such principal, premium or interest. The Trustee shall hold any such moneys uninvested.

ARTICLE XI

MISCELLANEOUS

Section 11.01. Successor Is Deemed Included in All References to Predecessor. Whenever in this Indenture either the Community Facilities District or the Trustee is named or referred to, such reference shall be deemed to include the successors or assigns thereof, and all the covenants and agreements in this Indenture contained required hereby to be performed by or on behalf of the Community Facilities District or the Trustee shall bind and inure to the benefit of the respective successors and assigns thereof whether so expressed or not.

Section 11.02. Limitation of Rights. Nothing in this Indenture or in the Bonds expressed or implied is intended or shall be construed to give to any Person other than the Trustee, the Community Facilities District and the Owners, any legal or equitable right, remedy or claim under or in respect of this Indenture or any covenant, condition or provision therein or herein contained, and all such covenants, conditions and provisions are and shall be held to be for the sole and exclusive benefit of the Trustee, the Community Facilities District and the Owners.

Section 11.03. Destruction of Bonds. Whenever in this Indenture provision is made for the cancellation by the Trustee and the delivery to the Community Facilities District of any Bonds, the Trustee shall, in lieu of such cancellation and delivery, destroy such Bonds.

Section 11.04. Severability of Invalid Provisions. If any one or more of the provisions contained in this Indenture or in the Bonds shall for any reason be held to be invalid, illegal or unenforceable in any respect, then such provision or provisions shall be deemed severable from the remaining provisions contained in this Indenture and such invalidity, illegality or unenforceability shall not affect any other provision of this Indenture, and this Indenture shall be construed as if such invalid or illegal or unenforceable provision had never been contained herein. The Community Facilities District hereby declares that it would have entered into this Indenture and each and every other Section, subsection, paragraph, sentence, clause or phrase hereof and authorized the issuance of the Bonds pursuant thereto irrespective of the fact that any one or more Sections, subsections, paragraphs, sentences, clauses or phrases of this Indenture may be held illegal, invalid or unenforceable.

Section 11.05. Notices. Any written notice, statement, demand, consent, approval, authorization, offer, designation, request or other communication to be given hereunder shall be given to the party entitled thereto at its address set forth below, or at such other address as such party may provide to the other parties in writing from time to time, namely:

If to the Community Facilities District:

City of Ontario Community Facilities District
No. 54 (Esperanza Facilities)
c/o City of Ontario
303 East "B" Street
Ontario, California 91764
Attention: Executive Director of Finance

If to the Trustee:

Zions Bancorporation, National Association
550 South Hope Street, Suite 2875
Los Angeles, California 90071
Attention: Corporate Trust Services

If to NMC Builders:

NMC Builders, LLC
c/o SC Ontario Development Corporation
1156 North Mountain Avenue
Upland, California 91786
Attention: Administrative Member

Each such notice, statement, demand, consent, approval, authorization, offer, designation, request or other communication hereunder shall be deemed delivered to the party to whom it is addressed (a) if given by courier or delivery service or if personally served or delivered, upon delivery, (b) if given by telecopier, upon the sender's receipt of an appropriate answerback or other written acknowledgment, (c) if given by electronic mail, on the date sent, but only if confirmation of the receipt of such electronic mail is received or if notice is concurrently sent by another means specified herein, (d) if given by registered or certified mail, return receipt requested, deposited with the United States mail postage prepaid, 72 hours after such notice is deposited with the United States mail, or (e) if given by any other means, upon delivery at the address specified in this Section.

Section 11.06. Evidence of Rights of Owners. Any request, consent or other instrument required or permitted by this Indenture to be signed and executed by Owners may be in any number of concurrent instruments of substantially similar tenor and shall be signed or executed by such Owners in person or by an agent or agents duly appointed in writing. Proof of the execution of any such request, consent or other instrument or of a writing appointing any such agent shall be sufficient for any purpose of this Indenture and shall be conclusive in favor of the Trustee and the Community Facilities District if made in the manner provided in this Section.

The fact and date of the execution by any Person of any such request, consent or other instrument or writing may be proved by the certificate of any notary public or other officer of any jurisdiction, authorized by the laws thereof to take acknowledgments of deeds, certifying that the Person signing such request, consent or other instrument acknowledged to such notary public or

such officer the execution thereof, or by an affidavit of a witness of such execution duly sworn to before such notary public or other officer.

The ownership of Bonds shall be proved by the Registration Books.

Any request, consent or other instrument or writing of the Owner of any Bond shall bind every future Owner of the same Bond and the Owner of every Bond issued in exchange therefor or in lieu thereof, in respect of anything done or suffered to be done by the Trustee or the Community Facilities District in accordance therewith or reliance thereon.

Section 11.07. Disqualified Bonds. In determining whether the Owners of the requisite aggregate principal amount of Bonds have concurred in any demand, request, direction, consent or waiver under this Indenture, Bonds that are actually known by the Trustee to be owned or held by or for the account of the Community Facilities District, or by any other obligor on the Bonds, or by any Person directly or indirectly controlling or controlled by, or under direct or indirect common control with, the Community Facilities District or any other obligor on the Bonds, shall be disregarded and deemed not to be Outstanding for the purpose of any such determination; provided, however, that if 100% of the Bonds are so owned or held, such Bonds shall be deemed to be Outstanding. Bonds so owned which have been pledged in good faith may be regarded as Outstanding for the purposes of this Section if the pledgee shall establish to the satisfaction of the Trustee the pledgee's right to vote such Bonds and that the pledgee is not a Person directly or indirectly controlling or controlled by, or under direct or indirect common control with, the Community Facilities District or any other obligor on the Bonds. In case of a dispute as to such right, any decision by the Trustee taken upon the advice of counsel shall be full protection to the Trustee. Upon request of the Trustee, the Community Facilities District shall specify in a Written Certificate of the Community Facilities District delivered to the Trustee which Bonds, if any, are, as of the date of such Written Certificate, owned or held by or for the account of the Community Facilities District.

Section 11.08. Money Held for Particular Bonds. The money held by the Trustee for the payment of the interest, principal or premium due on any date with respect to particular Bonds (or portions of Bonds in the case of Bonds redeemed in part only) shall, on and after such date and pending such payment, be set aside on its books and held in trust by it for the Owner entitled thereto, subject, however, to the provisions of Section 10.03, but without any liability for interest thereon.

Section 11.09. Funds and Accounts. Any fund or account required by this Indenture to be established and maintained by the Trustee may be established and maintained in the accounting records of the Trustee, either as a fund or an account, and may, for the purposes of such records, any audits thereof and any reports or statements with respect thereto, be treated either as a fund or as an account, but all such records with respect to all such funds and accounts shall at all times be maintained in accordance with prudent corporate trust industry standards, and with due regard for the requirements hereof and for the protection of the security of the Bonds and the rights of every Owner thereof. The Trustee may establish any such additional funds or accounts as it deems necessary to perform its obligations hereunder.

Section 11.10. Business Days. If the date for making any payment or the last date for performance of any act or the exercising of any right, as provided in this Indenture, shall not be a Business Day, such payment may be made or act performed or right exercised on the next succeeding Business Day, with the same force and effect as if done on the nominal date provided in this Indenture and, unless otherwise specifically provided in this Indenture, no interest shall accrue for the period from and after such nominal date.

Section 11.11. Waiver of Personal Liability. No member, officer, agent or employee of the Community Facilities District or the City shall be individually or personally liable for the payment of the principal of or premium or interest on the Bonds or be subject to any personal liability or accountability by reason of the issuance thereof, but nothing herein contained shall relieve any such member, officer, agent or employee from the performance of any official duty provided by any applicable provision of law or by this Indenture.

Section 11.12. Conflict with Act. In the event of any conflict between any provision of this Indenture and any provision of the Act, the provision of the Act shall prevail over the provision of this Indenture.

Section 11.13. Conclusive Evidence of Regularity. Bonds issued pursuant to this Indenture shall constitute evidence of the regularity of all proceedings under the Act relative to their issuance and the levy of the Special Taxes.

Section 11.14. Governing Laws. This Indenture shall be governed by and construed in accordance with the laws of the State.

Section 11.15. Electronic Signature. Each of the parties hereto agrees that the transaction consisting of this Indenture may be conducted by electronic means. Each party agrees, and acknowledges that it is such party's intent, that if such party signs this Indenture using an electronic signature, it is signing, adopting and accepting this Indenture and that signing this Indenture using an electronic signature is the legal equivalent of having placed its handwritten signature on this Indenture on paper. Each party acknowledges that it is being provided with an electronic or paper copy of this Indenture in a usable format.

Section 11.16. Execution in Several Counterparts. This Indenture may be executed in any number of counterparts and each of such counterparts shall for all purposes be deemed to be an original, and all such counterparts shall together constitute but one and the same instrument.

IN WITNESS WHEREOF, the Community Facilities District has caused this Indenture to be signed in its name by its representative thereunto duly authorized, and the Trustee, in token of its acceptance of the trusts created hereunder, has caused this Indenture to be signed in its corporate name by its officer thereunto duly authorized, all as of the day and year first above written.

CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 54 (ESPERANZA FACILITIES)

By: _____

ZIONS BANCORPORATION, NATIONAL ASSOCIATION, AS TRUSTEE

By: _____

[Signature Page to Indenture]

EXHIBIT A

PERMITTED INVESTMENTS

"Permitted Investments" means the following:

(1) (a) Direct obligations (other than an obligation subject to variation in principal repayment) of the United States of America ("United States Treasury Obligations"), (b) obligations fully and unconditionally guaranteed as to timely payment of principal and interest by the United States of America, (c) obligations fully and unconditionally guaranteed as to timely payment of principal and interest by any agency or instrumentality of the United States of America when such obligations are backed by the full faith and credit of the United States of America, or (d) evidences of ownership of proportionate interests in future interest and principal payments on obligations described above held by a bank or trust company as custodian, under which the owner of the investment is the real party in interest and has the right to proceed directly and individually against the obligor and the underlying government obligations are not available to any person claiming through the custodian or to whom the custodian may be obligated.

(2) Federal Housing Administration debentures.

(3) The listed obligations of government-sponsored agencies which are not backed by the full faith and credit of the United States of America:

- Federal Home Loan Mortgage Corporation (FHLMC)
  Senior debt obligations and participation certificates (excluded are stripped mortgage securities which are purchased at prices exceeding their principal amounts)
- Farm Credit System (formerly: Federal Land Banks, Federal Intermediate Credit Banks and Banks for Cooperatives)
  Consolidated system wide bonds and notes
- Federal Home Loan Banks (FHL Banks)
  Consolidated debt obligations
- Federal National Mortgage Association (FNMA)
  Senior debt obligations
  Mortgage-backed securities (excluded are stripped mortgage securities which are purchased at prices exceeding their principal amounts)

(4) Unsecured certificates of deposit, time deposits or other bank deposit products, and bankers' acceptances (having maturities of not more than 365 days) of any bank, the short-term obligations of which are rated "A-1+" or better by S&P and "Prime-1" by Moody's.

(5) Deposits the aggregate amount of which are fully insured by the Federal Deposit Insurance Corporation, in banks which have capital and surplus of at least $15 million.

(6) Commercial paper (having original maturities of not more than 270 days) rated at the time of purchase "A-1+" by S&P and "Prime-1" by Moody's.

(7) Money market mutual funds rated "AAm" or "AAm-G" by S&P, or better and, if rated by Moody's, rated "Aa2" or better, including a fund for which the Trustee, its parent holding company, if any, or any affiliates or subsidiaries of the Trustee provide transfer agency, custodial, investment advisory or other management services, and, subject to the prior written consent of S&P and Moody's, the investment pool maintained by the county in which the Community Facilities District is located or other investment pools, in either case so long as such pool is rated in one of the two highest rating categories by S&P and Moody's.

(8) State Obligations, which means

(a) Direct general obligations of any state of the United States of America or any subdivision or agency thereof to which is pledged the full faith and credit of a state the unsecured general obligation debt of which is rated at least "A3" by Moody's and at least "A-" by S&P, or better, or any obligation fully and unconditionally guaranteed by any state, subdivision or agency whose unsecured general obligation debt is so rated.

(b) Direct, general short-term obligations of any state agency or subdivision or agency thereof described in (a) above and rated "A-1+" by S&P and "MIG-1" by Moody's.

(c) Special Revenue Bonds (as defined in the United States Bankruptcy Code) of any state or state agency in (a) above and rated "AA-" or better by S&P and "Aa3" or better by Moody's.

(9) Pre-refunded municipal obligations rated "AA+" by S&P and "Aaa" by Moody's meeting the following requirements:

(a) the municipal obligations are (i) not subject to redemption prior to maturity or (ii) the trustee for the municipal obligations has been given irrevocable instructions concerning their call and redemption and the issuer of the municipal obligations has covenanted not to redeem such municipal obligations other than as set forth in such instructions;

(b) the municipal obligations are secured by cash or United States Treasury Obligations which may be applied only to payment of the principal of, interest and premium on such municipal obligations;

(c) the principal of and interest on the United States Treasury Obligations (plus any cash in the escrow) has been verified by the report of

independent certified public accountants to be sufficient to pay in full all principal of, interest, and premium, if any, due and to become due on the municipal obligations ("Verification Report");

(d) the cash or United States Treasury Obligations serving as security for the municipal obligations are held by an escrow agent or trustee in trust for owners of the municipal obligations;

(e) no substitution of a United States Treasury Obligation shall be permitted except with another United States Treasury Obligation and upon delivery of a new Verification Report; and

(f) the cash or the United States Treasury Obligations are not available to satisfy any other claims, including those by or against the trustee or escrow agent.

(10) Repurchase agreements:

A. With (i) any domestic bank, or domestic branch of a foreign bank, the long term debt of which is rated at least "A-" by S&P and "Aa3" by Moody's; (ii) any broker-dealer with "retail customers" or a related affiliate thereof which broker-dealer has, or the parent company (which guarantees the provider) of which has, long-term debt rated at least "A-" by S&P and "Aa3" Moody's, which broker-dealer falls under the jurisdiction of the Securities Investors Protection Corporation; or (iii) any other entity rated at least "A-" by S&P and "A3" by Moody's (each, an "Eligible Provider"), provided that:

a. The (i) permitted collateral shall include U.S. Treasury Obligations, or senior debt obligations of GNMA, FNMA or FHLMC (no collateralized mortgage obligations shall be permitted for these providers), and (ii) collateral levels must be at least 102% of the total principal when the collateral type is U.S. Treasury Obligations, 103% of the total principal when the collateral type is GNMAs and 104% of the total principal when the collateral type is FNMA and FHLMC ("Eligible Collateral");

b. The Trustee or a third party acting solely as agent therefor or for the Community Facilities District (the "Custodian") has possession of the collateral or the collateral has been transferred to the Custodian in accordance with applicable state and federal laws (other than by means of entries on the transferor's books);

c. The collateral shall be marked to market on a daily basis and the provider or Custodian shall send monthly reports to the Trustee and the Community Facilities District setting forth the type of collateral, the collateral percentage required for that collateral type, the market value of the collateral on the valuation date and the name of the Custodian holding the collateral;

d. The repurchase agreement shall state, and an opinion of counsel shall be rendered at the time such collateral is delivered that the Custodian has a perfected first priority security interest in the collateral, any substituted collateral and all proceeds thereof; and

e. The repurchase agreement shall provide that if during its term the provider's rating by either Moody's or S&P is withdrawn or suspended or falls below "A-" by S&P or "A3" by Moody's, as appropriate, the provider must, notify the Trustee and the Community Facilities District within five days of receipt of such notice. Within ten days of receipt of such notice, the provider shall either (i) post Eligible Collateral, or (ii) assign the agreement to an Eligible Provider. If the provider does not perform a remedy within ten business days, the provider shall, at the direction of the Trustee or the Community Facilities District repurchase all collateral and terminate the repurchase agreement, with no penalty or premium to the Trustee or the Community Facilities District.

(11) Investment agreements with a domestic or foreign bank or corporation the long-term debt of which, or, in the case of a guaranteed corporation the long-term debt, or, in the case of a monoline financial guaranty insurance company, claims paying ability, of the guarantor is rated at least "AA" by S&P and "Aa3" by Moody's (each, an "Eligible Provider"); provided, that, by the terms of the investment agreement:

(a) interest payments are to be made to the Trustee at times and in amounts as necessary to pay debt service on the Bonds;

(b) the invested funds are available for withdrawal without penalty or premium, at any time upon not more than seven days' prior notice; the Trustee and the Community Facilities District hereby agree to give or cause to be given notice in accordance with the terms of the investment agreement so as to receive funds thereunder with no penalty or premium paid;

(c) the provider shall send monthly reports to the Trustee and the Community Facilities District setting forth the balance the Community Facilities District or the Trustee has invested with the provider and the amounts and dates of interest accrued and paid by the provider;

(d) the investment agreement shall state that it is an unconditional and general obligation of the provider, and is not subordinated to any other obligation of, the provider thereof or, if the provider is a bank, the agreement or the opinion of counsel shall state that the obligation of the provider to make payments thereunder ranks pari passu with the obligations of the provider to its other depositors and its other unsecured and unsubordinated creditors;

(e) the Trustee and the Community Facilities District shall receive an opinion of domestic counsel to the provider that such investment agreement is

legal, valid and binding and enforceable against the provider in accordance with its terms;

(f) the Trustee and the Community Facilities District shall receive an opinion of foreign counsel to the provider (if applicable) that (i) the investment agreement has been duly authorized, executed and delivered by the provider and constitutes the legal, valid and binding obligation of the provider, enforceable against the provider in accordance with its terms, (ii) the choice of law of the state set forth in the investment agreement is valid under that country's laws and a court in such country would uphold such choice of law, and (iii) any judgment rendered by a court in the United States would be recognized and enforceable in such country;

(g) the investment agreement shall provide that if during its term (i) the provider's rating by either S&P or Moody's falls below "AA-" or "Aa3", respectively, the provider shall, at its option, within ten days of receipt of publication of such downgrade, either (A) post Eligible Collateral with the Trustee, the Community Facilities District or a third party acting solely as agent therefor (the "Custodian") free and clear of any third party liens or claims, (B) assign the agreement to an Eligible Provider, or (C) repay the principal of and accrued but unpaid interest on the investment, and (ii) the provider's rating by either S&P or Moody's falls below "A-" or "A3", respectively, the provider must, at the direction of the Trustee or the Community Facilities District, within ten days of receipt of such direction, repay the principal of and accrued but unpaid interest on the investment, in either case with no penalty or premium to the Trustee or the Community Facilities District;

(h) in the event the provider is required to collateralize, permitted collateral shall include U.S. Treasury Obligations, or senior debt obligations of GNMA, FNMA or FHLMC (no collateralized mortgage obligations shall be permitted for these providers) and collateral levels must be 102% of the total principal when the collateral type is U.S. Treasury Obligations, 103% of the total principal when the collateral type is GNMAs and 104% of the total principal when the collateral type is FNMA and FHLMC ("Eligible Collateral"). In addition, the collateral shall be marked to market on a daily basis and the provider or Custodian shall send monthly reports to the Trustee and the Community Facilities District setting forth the type of collateral, the collateral percentage required for that collateral type, the market value of the collateral on the valuation date and the name of the Custodian holding the collateral;

(i) the investment agreement shall state, and an opinion of counsel shall be rendered, in the event collateral is required to be pledged by the provider under the terms of the investment agreement, at the time such collateral is delivered, that the Custodian has a perfected first priority security interest in the collateral, any substituted collateral and all proceeds thereof; and

(j) the investment agreement must provide that if during its term (i) the provider shall default in its payment obligations, the provider's obligations under the investment agreement shall, at the direction of the Trustee or the Community Facilities District, be accelerated and amounts invested and accrued but unpaid interest thereon shall be repaid to the Trustee or the Community Facilities District, as appropriate, and (ii) the provider shall become insolvent, not pay its debts as they become due, be declared or petition to be declared bankrupt, etc. ("event of insolvency"), the provider's obligations shall automatically be accelerated and amounts invested and accrued but unpaid interest thereon shall be repaid to the Trustee or the Community Facilities District, as appropriate.

EXHIBIT B

FORM OF SERIES 2022 BOND

No. _____ $_____

CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 54
(ESPERANZA FACILITIES)
SPECIAL TAX BOND, SERIES 2022

INTEREST RATE	MATURITY DATE	DATED DATE	CUSIP
_____%	September 1, 20__	_____, 2022	_____

REGISTERED OWNER:

PRINCIPAL AMOUNT:

City of Ontario Community Facilities District No. 54 (Esperanza Facilities) (the "Community Facilities District"), for value received, hereby promises to pay, solely from the sources hereinafter described, to the Registered Owner identified above or registered assigns (the "Registered Owner"), on the Maturity Date identified above or on any earlier redemption date, the Principal Amount identified above in lawful money of the United States of America; and to pay interest thereon at the Interest Rate identified above in like lawful money from the date hereof payable semiannually on March 1 and September 1 in each year, commencing September 1, 2022 (the "Interest Payment Dates"), until payment of such Principal Amount in full.

This Bond is one of a series of a duly authorized issue of bonds approved by the qualified electors of the Community Facilities District, pursuant to the Mello-Roos Community Facilities Act of 1982, constituting Sections 53311 *et seq*. of the California Government Code (the "Act"), and issued for the purpose of financing certain public facilities, and is one of the series of bonds designated "City of Ontario Community Facilities District No. 54 (Esperanza Facilities) Special Tax Bonds, Series 2022" (the "Series 2022 Bonds") in the aggregate principal amount of $_____. The Series 2022 Bonds are issued pursuant to the Indenture, dated as of _____ 1, 2022 (the "Indenture"), by and between the Community Facilities District and Zions Bancorporation, National Association, as trustee (said entity or any successor thereto as trustee under the Indenture, the "Trustee"), and this reference incorporates the Indenture herein, and by acceptance hereof the owner of this Bond assents to said terms and conditions. Pursuant to and as more particularly provided in the Indenture, additional bonds ("Additional Bonds") may be issued by the Community Facilities District on a parity with the Series 2022 Bonds. The Series 2022 Bonds and any Additional Bonds are collectively referred to as the "Bonds." The Indenture is

entered into, and this Bond is issued under, the Act and the laws of the State of California. Capitalized undefined terms used herein shall have the meanings ascribed thereto in the Indenture.

Interest on the Series 2022 Bonds shall be payable from the Interest Payment Date next preceding the date of authentication thereof unless (i) a Series 2022 Bond is authenticated on or before an Interest Payment Date and after the close of business on the preceding Record Date, in which event interest thereon shall be payable from such Interest Payment Date, (ii) a Series 2022 Bond is authenticated on or before the first Record Date, in which event interest thereon shall be payable from the Closing Date, or (iii) interest on any Series 2022 Bond is in default as of the date of authentication thereof, in which event interest thereon shall be payable from the date to which interest has previously been paid or duly provided for. Interest shall be paid in lawful money of the United States on each Interest Payment Date. Interest shall be paid by check of the Trustee mailed by first-class mail, postage prepaid, on each Interest Payment Date to the Owners of the Series 2022 Bonds at their respective addresses shown on the Registration Books as of the close of business on the preceding Record Date. Notwithstanding the foregoing, interest on any Series 2022 Bond that is not punctually paid or duly provided for on any Interest Payment Date shall, if and to the extent that amounts subsequently become available therefor, be paid on a payment date established by the Trustee to the Person in whose name the ownership of such Series 2022 Bond is registered on the Registration Books at the close of business on a special record date to be established by the Trustee for the payment of such defaulted interest, notice of which shall be given to such Owner not less than ten days prior to such special record date. The principal of the Series 2022 Bonds shall be payable in lawful money of the United States of America upon presentation and surrender thereof upon maturity or earlier redemption at the Office of the Trustee.

The Bonds are special, limited obligations of the Community Facilities District, payable, as provided in the Indenture, solely from Net Special Tax Revenues and the other assets pledged therefor thereunder. Neither the faith and credit nor the taxing power of the Community Facilities District (except to the limited extent set forth in the Indenture), the City of Ontario or the State of California, or any political subdivision thereof, is pledged to the payment of the Bonds.

Pursuant to and as more particularly provided in the Indenture, subject only to the provisions of the Indenture permitting the application thereof for the purposes and on the terms and conditions set forth therein, in order to secure the payment of the principal of, premium, if any, and interest on the Bonds in accordance with their terms, the provisions of the Indenture and the Act, the Community Facilities District pledges to the Owners, and grants thereto a lien on and a security interest in, all of the Net Special Tax Revenues and any other amounts held in the Special Tax Fund, the Bond Fund and the Reserve Fund. Said pledge constitutes a first lien on and security interest in such assets, which shall immediately attach to such assets and be effective, binding and enforceable against the Community Facilities District, its successors, purchasers of any of such assets, creditors and all others asserting rights therein, to the extent set forth in, and in accordance with, the Indenture, irrespective of whether those parties have notice of the pledge of, lien on and security interest in such assets and without the need for any physical delivery, recordation, filing or further act.

The Series 2022 Bonds are subject to redemption on the dates, at the Redemption Prices and pursuant to the terms set forth in the Indenture. Notice of redemption of any Series 2022 Bond or any portion thereof shall be given as provided in the Indenture.

The Series 2022 Bonds are issuable as fully registered Bonds without coupons in Authorized Denominations ($5,000 and any integral multiple thereof).

Any Series 2022 Bond may be transferred upon the Registration Books by the Person in whose name it is registered, in person or by such Person's duly authorized attorney, upon surrender of such Series 2022 Bond to the Trustee for cancellation, accompanied by delivery of a written instrument of transfer, duly executed in a form acceptable to the Trustee. Whenever any Series 2022 Bond or Series 2022 Bonds shall be so surrendered for transfer, the Community Facilities District shall execute and the Trustee shall authenticate and shall deliver a new Series 2022 Bond or Series 2022 Bonds of the same maturity in a like aggregate principal amount, in any Authorized Denomination. The Trustee shall require the Owner requesting such transfer to pay any tax or other governmental charge required to be paid with respect to such transfer. The Series 2022 Bonds may be exchanged at the Office of the Trustee for a like aggregate principal amount of Series 2022 Bonds of the same maturity of other Authorized Denominations. The Trustee shall require the payment by the Owner requesting such exchange of any tax or other governmental charge required to be paid with respect to such exchange.

The Indenture and the rights and obligations of the Community Facilities District, the Owners and the Trustee may be modified or amended in the manner, to the extent, and upon the terms provided in the Indenture.

The Indenture contains provisions permitting the Community Facilities District to make provision for the payment of the principal of and the interest and premium, if any, on any of the Bonds so that such Bonds shall no longer be deemed to be Outstanding under the terms of the Indenture.

Unless this Bond is presented by an authorized representative of The Depository Trust Company to the Trustee for registration of transfer, exchange or payment, and any Bond issued is registered in the name of Cede & Co. or such other name as requested by an authorized representative of The Depository Trust Company and any payment is made to Cede & Co., ANY TRANSFER, PLEDGE OR OTHER USE HEREOF FOR VALUE OR OTHERWISE BY OR TO ANY PERSON IS WRONGFUL since the registered owner hereof, Cede & Co., has an interest herein.

IN WITNESS WHEREOF, the Community Facilities District has caused this Bond to be signed in its name and on its behalf by the manual or facsimile signature of the Mayor of the City of Ontario, attested by the manual or facsimile signature of the City Clerk of the City of Ontario, all as of the Dated Date identified above.

CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 54 (ESPERANZA FACILITIES)

By: _____
Mayor of the City of Ontario

ATTEST:

_____
Clerk

CERTIFICATE OF AUTHENTICATION

This is one of the Series 2022 Bonds described in the within-mentioned Indenture and registered on the Registration Books.

Date: _____

ZIONS BANCORPORATION, NATIONAL ASSOCIATION, AS TRUSTEE

By: _____
Authorized Officer

ASSIGNMENT

For value received, the undersigned hereby sells, assigns and transfers unto _____, whose address and social security or other tax identifying number is _____, the within-mentioned Bond and hereby irrevocably constitute(s) and appoint(s) _____ attorney, to transfer the same on the registration books of the Trustee with full power of substitution in the premises.

Dated: _____

Signature Guaranteed:

_____

Note: Signature guarantee shall be made by a guarantor institution participating in the Securities Transfer Agents Medallion Program or in such other guarantee program acceptable to the Trustee.

Note: The signature(s) on this Assignment must correspond with the name(s) as written on the face of the within Bond in every particular without alteration or enlargement or any change whatsoever.

$[PAR]
CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 54
(ESPERANZA FACILITIES)
SPECIAL TAX BONDS, SERIES 2022

BOND PURCHASE AGREEMENT

[Pricing Date]

City of Ontario
Community Facilities District No. 54
(Esperanza Facilities)
303 East "B" Street
Ontario, California 91764

Ladies and Gentlemen:

Stifel, Nicolaus & Company, Incorporated, as underwriter (the "Underwriter"), acting not as a fiduciary or agent for you, but on behalf of itself, offers to enter into this Bond Purchase Agreement (this "Purchase Agreement") with City of Ontario Community Facilities District No. 54 (Esperanza Facilities) (the "Community Facilities District"), which upon acceptance will be binding upon the Underwriter and the Community Facilities District. The agreement of the Underwriter to purchase the Bonds (as hereinafter defined) is contingent upon the Community Facilities District satisfying all of the obligations imposed upon them under this Purchase Agreement. This offer is made subject to the Community Facilities District's acceptance by the execution of this Purchase Agreement and its delivery to the Underwriter at or before 8:00 p.m., local time, on the date hereof, and, if not so accepted, will be subject to withdrawal by the Underwriter upon notice delivered to the Community Facilities District at any time prior to the acceptance hereof by the Community Facilities District. All capitalized terms used herein, which are not otherwise defined, shall have the meaning provided for such terms in the Indenture, dated as of [May] 1, 2022 (the "Indenture"), by and between the Community Facilities District and Zions Bancorporation, National Association, as trustee (the "Trustee").

1. Purchase, Sale and Delivery of the Bonds.

Subject to the terms and conditions and in reliance upon the representations, warranties and agreements set forth herein, the Underwriter hereby agrees to purchase from the Community Facilities District and the Community Facilities District hereby agrees to sell to the Underwriter all (but not less than all) of the $[PAR] aggregate principal amount of the City of Ontario Community Facilities District No. 54 (Esperanza Facilities) Special Tax Bonds, Series 2022 (the "Bonds"), dated the Closing Date (as hereinafter defined), bearing interest at the rates and maturing on the dates and in the principal amounts set forth in Exhibit A hereto. The purchase price for the Bonds shall be $_____ (being 100% of the aggregate principal amount thereof, plus original issue premium of $_____ and less an Underwriter's discount of $_____).

The Underwriter agrees to make a bona fide public offering of all of the Bonds initially at the public offering prices (or yields) set forth in Exhibit A attached hereto and incorporated herein by reference. Subsequent to the initial public offering, the Underwriter reserves the right to change the public offering prices (or yields) as it deems necessary in connection with the marketing of the Bonds subject to Section 4 hereof, provided that the Underwriter shall not change the interest rates set forth in Exhibit A. The Bonds will be offered and sold to certain dealers at prices lower than such initial offering prices.

The Bonds shall be substantially in the form described in, shall be issued and secured under the provisions of, and shall be payable from the Net Special Tax Revenues as provided in the Indenture, the Preliminary Official Statement (as hereinafter defined), and the Mello-Roos Community Facilities Act of 1982, as amended (Section 53311 *et seq*. of the Government Code of the State of California) (the "Community Facilities District Act"). The issuance of the Bonds has been duly authorized by the City Council of the City of Ontario (the "City"), as the legislative body for the Community Facilities District, pursuant to a resolution (the "Community Facilities District Resolution of Issuance") adopted on [April 19], 2022.

The net proceeds of the Bonds will be used to (i) provide financing for certain public facilities and costs with respect thereto related to the development within the Community Facilities District, (ii) fund a reserve fund with respect to the Bonds, and (iii) pay the costs of issuance with respect to the Bonds.

A. The Community Facilities District hereby acknowledges that the Underwriter is entering into this Purchase Agreement in reliance on the representations, warranties and agreements made by the Community Facilities District herein, and the Community Facilities District shall take all action necessary to enforce its rights hereunder for the benefit of the Underwriter and shall immediately notify the Underwriter if it becomes aware that any representation, warranty or agreement made by the Community Facilities District herein is incorrect in any material respect.

The Community Facilities District acknowledges and agrees that (i) the purchase and sale of the Bonds pursuant to this Purchase Agreement is an arm's-length commercial transaction between the Community Facilities District and the Underwriter, (ii) in connection therewith and with the discussions, undertakings and procedures leading up to the consummation of such transaction, the Underwriter is and has been acting solely as principal and is not acting as the agent or fiduciary of, or a municipal or financial advisor of, the Community Facilities District and has not assumed any advisory or fiduciary responsibility to the Community Facilities District with respect to the transaction contemplated hereby and the discussions, undertakings and procedures leading thereto (irrespective of whether the Underwriter has provided or is currently providing other services to the Community Facilities District on other matters), (iv) the Underwriter has financial interests that differ from those of the Community Facilities District, (v) the only obligations the Underwriter has to the Community Facilities District with respect to the transaction contemplated hereby are expressly set forth in this Purchase Agreement, except as otherwise provided by applicable rules and regulations of the Securities and Exchange Commission or the rules of the MSRB (as defined below) or other law, and (vi) the Community Facilities District has consulted its own legal, financial, accounting, tax, and other advisors to the extent they have deemed appropriate in connection with this transaction. The Community Facilities District acknowledges that it has previously provided the Underwriter with an acknowledgement of receipt of the required Underwriter disclosure under Rule G-17 of the Municipal Securities Rulemaking Board ("MSRB"). The Community Facilities District acknowledges and represents that it has engaged CSG Advisors Incorporated as its municipal advisor

(as defined in Securities and Exchange Commission Rule 15Ba1) and will rely solely on the financial advice of CSG Advisors Incorporated with respect to the Bonds.

B. Pursuant to the authorization of the Community Facilities District, the Underwriter has distributed copies of the Preliminary Official Statement dated [POS Date], relating to the Bonds, which, together with the cover page, inside cover page and appendices thereto is herein called the "Preliminary Official Statement." By its acceptance of this Purchase Agreement, the Community Facilities District hereby ratifies the use by the Underwriter of the Preliminary Official Statement, and the Community Facilities District agrees to execute a final official statement relating to the Bonds (the "Official Statement") which will consist of the Preliminary Official Statement with such changes as may be made thereto, with the approval of Orrick Herrington & Sutcliffe LLP, Bond Counsel ("Bond Counsel"), Stradling Yocca Carlson & Rauth, a Professional Corporation, Disclosure Counsel ("Disclosure Counsel"), and the Underwriter, and to provide copies thereof to the Underwriter as set forth herein. The Community Facilities District hereby authorizes and requires the Underwriter to use and promptly distribute, in connection with the offer and sale of the Bonds, the Preliminary Official Statement, the Official Statement and any supplement or amendment thereto. The Community Facilities District further authorizes the Underwriter to use and distribute, in connection with the offer and sale of the Bonds, the Indenture, the Continuing Disclosure Agreement executed by the Community Facilities District in connection with the Bonds (the "Continuing Disclosure Agreement"), this Purchase Agreement and all information contained herein, and all other documents, certificates and statements furnished by or on behalf of the Community Facilities District to the Underwriter in connection with the transactions contemplated by this Purchase Agreement.

C. To assist the Underwriter in complying with Securities and Exchange Commission Rule 15c2-12(b)(5) (the "Rule"), the Community Facilities District will undertake pursuant to the Continuing Disclosure Agreement, in the form attached as an appendix to the Official Statement, to provide annual reports and notices of certain enumerated events. A description of this undertaking is set forth in the Preliminary Official Statement and will also be set forth in the Official Statement.

D. Except as the Underwriter and the Community Facilities District may otherwise agree, the Community Facilities District will deliver to the Underwriter, at the offices of Bond Counsel in Los Angeles, California, or at such other location as may be mutually agreed upon by the Underwriter and the Community Facilities District, the documents hereinafter mentioned; and the Community Facilities District will deliver to the Underwriter through the facilities of The Depository Trust Company ("DTC"), the Bonds, in definitive form (all Bonds bearing CUSIP numbers), duly executed by the Community Facilities District and authenticated by the Trustee in the manner provided for in the Indenture and the Community Facilities District Act at 8:00 a.m. California time, on [Closing Date] (the "Closing Date"), and the Underwriter will accept such delivery and pay the purchase price of the Bonds as set forth in paragraph (A) of this Section by wire transfer, payable in federal or other immediately available funds (such delivery and payment being herein referred to as the "Closing"). The Bonds shall be in fully registered book-entry form (which may be typewritten) and shall be registered in the name of Cede & Co., as nominee of DTC.

2. Representations, Warranties and Covenants of the Community Facilities District. The Community Facilities District represents, warrants and covenants to the Underwriter on behalf of itself and the City that:

A. The City is duly organized and validly existing as a general law city under the Constitution and laws of the State of California and has duly authorized the formation of the Community Facilities District and the incurring of bonded indebtedness thereby pursuant to resolutions duly adopted by the City Council (collectively, the "Community Facilities District Formation Resolutions" and, together with the Community Facilities District Resolution of Issuance, the "Community Facilities District Resolutions") and the Community Facilities District Act. The City Council, as the legislative body of the City and the Community Facilities District, has duly adopted the Community Facilities District Formation Resolutions and an ordinance of the City Council levying Special Taxes within the Community Facilities District (the "Ordinance"), and has caused to be recorded in the real property records of the County of San Bernardino, a notice of special tax lien, and any required amendments thereof (collectively, the "Notice of Special Tax Lien" and, together with the Community Facilities District Formation Resolutions and the Ordinance, the "Formation Documents"), and has duly adopted the Community Facilities District Resolution of Issuance. Each of its Formation Documents remains in full force and effect as of the date hereof and has not been amended or rescinded. The Community Facilities District is duly organized and validly existing as a Community Facilities District under the laws of the State of California. The Community Facilities District has, and at the Closing Date will have, as the case may be, full legal right, power and authority: (i) to execute, deliver and perform its obligations under this Purchase Agreement, the Continuing Disclosure Agreement and the Indenture, and to carry out all transactions contemplated by each of such agreements; (ii) to issue, sell and deliver the Bonds as provided herein; and (iii) to carry out, give effect to and consummate the transactions contemplated by the Formation Documents, the Indenture, the Bonds, the Continuing Disclosure Agreement, this Purchase Agreement, the Acquisition and Funding Agreement dated as of May 1, 2019 (the "GDC/CDG Esperanza Acquisition Agreement"), by and between the City and GDC/CDG Esperanza PA 4 Venture, L.P., a Delaware limited partnership ("GDC/CDG Esperanza"), the Acquisition and Funding Agreement, dated as of July 21, 2015, by and between the City and NMC Builders, LLC (the "NMC Builders Acquisition Agreement" and together with the GDC/CDG Esperanza Acquisition Agreement, the "Acquisition Agreements"), and the Official Statement.

This Purchase Agreement, the Indenture, the Bonds, the Continuing Disclosure Agreement, and the Acquisition Agreements are collectively referred to herein as the "Community Facilities District Documents."

B. The Community Facilities District and the City, as applicable, have each complied, and will at the Closing Date be in compliance in all material respects, with the Formation Documents and the Community Facilities District Documents, and any immaterial noncompliance by the Community Facilities District and the City, if any, will not impair the ability of the Community Facilities District and the City, as applicable, to carry out, give effect to or consummate the transactions contemplated by the foregoing. From and after the date of issuance of the Bonds, the Community Facilities District will continue to comply with the covenants of the Community Facilities District contained in the Community Facilities District Documents.

C. The information in the Preliminary Official Statement and in the Official Statement relating to the Community Facilities District and the Bonds (other than statements pertaining to the book-entry system, as to which no view is expressed), is true and correct in all material respects and does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements therein, in light of the circumstances under which they were made, not misleading; and, upon delivery and up to and including 25 days after the End of the Underwriting Period (as defined in paragraph (D) below), the Official Statement will be amended

and supplemented so as to contain no misstatement of any material fact or omission of any statement necessary to make the statements contained therein, in the light of the circumstances in which such statements were made, not misleading.

D. Up to and including 25 days after the End of the Underwriting Period (as defined below), the Community Facilities District will advise the Underwriter promptly of any proposal to amend or supplement the Official Statement and will not affect or consent to any such amendment or supplement without the consent of the Underwriter, which consent will not be unreasonably withheld. The Community Facilities District will advise the Underwriter promptly of the institution of any proceedings known to it by any governmental agency prohibiting or otherwise materially affecting the use of the Official Statement in connection with the offering, sale or distribution of the Bonds. As used herein, the term "End of the Underwriting Period" means the later of such time as: (i) the Bonds are delivered to the Underwriter; or (ii) the Underwriter does not retain, directly or as a member of an underwriting syndicate, an unsold balance of the Bonds for sale to the public. Unless the Underwriter gives notice to the contrary, the End of the Underwriting Period shall be deemed to be the Closing Date. Any notice delivered pursuant to this provision shall be written notice delivered to the Community Facilities District at or prior to the Closing Date, and shall specify a date (other than the Closing Date) to be deemed the "End of the Underwriting Period."

E. Except as described in the Preliminary Official Statement, the Community Facilities District is not, in any respect material to the transactions referred to herein or contemplated hereby, in breach of or in default under, any law or administrative rule or regulation of the State of California, the United States of America, or of any department, division, agency or instrumentality of either thereof, or under any applicable court or administrative decree or order, or under any loan agreement, note, resolution, indenture, contract, agreement or other instrument to which the Community Facilities District is a party or is otherwise subject or bound, and the performance of its obligations under the Community Facilities District Documents and compliance with the provisions of each thereof, or the performance of the conditions precedent to be performed by the Community Facilities District pursuant to this Purchase Agreement, will not conflict with or constitute a breach of or default under any applicable law or administrative rule or regulation of the State, the United States of America, or of any department, division, agency or instrumentality of either thereof, or under any applicable court or administrative decree or order, or under any loan agreement, note, resolution, indenture, contract, agreement or other instrument to which the Community Facilities District is a party or is otherwise subject or bound, in any manner which would materially and adversely affect the performance by the Community Facilities District of its obligations under the Community Facilities District Documents or the performance of the conditions precedent to be performed by the Community Facilities District pursuant to this Purchase Agreement.

F. Except as may be required under the "blue sky" or other securities laws of any jurisdiction, all approvals, consents, authorizations, elections and orders of, or filings or registrations with, any governmental authority, board, agency or commission having jurisdiction which would constitute a condition precedent to, or the absence of which would materially adversely affect, the performance by the Community Facilities District of its obligations under the Community Facilities District Documents, and the performance of the conditions precedent to be performed by the Community Facilities District pursuant to this Purchase Agreement, have been or will be obtained at the Closing Date and are or will be in full force and effect at the Closing Date.

G. The Community Facilities District Documents conform as to form and tenor to the descriptions thereof contained in the Official Statement.

H. The Bonds are payable from the Net Special Tax Revenues of the Community Facilities District, as set forth in the Indenture, the levy of which has been duly and validly authorized pursuant to the Community Facilities District Act and the Special Taxes within the Community Facilities District will be fixed and levied in an amount which, together with other available funds, is required for the payment of the principal of, and interest on, the Bonds when due and payable, all as provided in the Indenture. The Community Facilities District has covenanted to cause the Special Taxes to be levied and collected at the same time and in the same manner as ordinary *ad valorem* property taxes or in such other manner as the City Council shall determine.

I. The Indenture creates a valid pledge of, first lien upon and security interest in, the Net Special Tax Revenues of the Community Facilities District, and in the moneys in the Special Tax Fund, the Bond Fund, and the Reserve Fund established pursuant to the Indenture, on the terms and conditions set forth in the Indenture.

J. Except as disclosed in the Preliminary Official Statement, there are, to the best of the Community Facilities District's knowledge, no entities with outstanding assessment liens against any of the properties within the Community Facilities District or which are senior to or on a parity with the Special Taxes of the Community Facilities District referred to in paragraph (H) hereof.

K. The information contained in the Preliminary Official Statement and in the Official Statement (other than statements therein pertaining to the DTC and its book-entry system, as to which no view is expressed) is true and correct in all material respects and such information does not and shall not contain any untrue or misleading statement of a material fact or omit to state any material fact necessary to make the statements therein, in light of the circumstances under which they were made, not misleading.

L. The Preliminary Official Statement was deemed final by a duly authorized officer of the Community Facilities District prior to its delivery to the Underwriter, except for the omission of such information as is permitted to be omitted in accordance with paragraph (b)(1) of the Rule. The Community Facilities District hereby covenants and agrees that, within seven (7) business days from the date hereof, or upon reasonable written notice from the Underwriter within sufficient time to accompany any confirmation requesting payment from any customers of the Underwriter, the Community Facilities District shall cause a final printed form of the Official Statement to be delivered to the Underwriter in sufficient quantity to comply with paragraph (b)(4) of the Rule and Rules G-12, G-15, G-32 and G-36 of the MSRB.

M. At the time of acceptance hereof there is and as of the Closing there will be no action, suit, proceeding, inquiry or investigation, at law or in equity, before or by any court, government agency, public board or body (collectively and individually, an "Action") pending (notice of which has been served on the City or the Community Facilities District) or to the best knowledge of the Community Facilities District or the City threatened, in which any such Action: (i) in any way questions the existence of the Community Facilities District or the titles of the officers of the Community Facilities District to their respective offices; (ii) affects, contests or seeks to prohibit, restrain or enjoin the issuance or delivery of the Bonds or the payment or collection of Special Taxes or any amounts pledged or to be pledged to pay the principal of and interest on the Bonds, or in any way contests or affects the validity of the Community Facilities District Documents or the consummation of the transactions on the part of the Community Facilities District contemplated thereby; (iii) contests the exemption of interest on the Bonds from federal or State

income taxation or contests the powers of the Community Facilities District which may result in any material adverse change relating to the financial condition of the Community Facilities District; or (iv) contests the completeness or accuracy of the Preliminary Official Statement or the Official Statement or any supplement or amendment thereto or asserts that the Preliminary Official Statement or the Official Statement contained any untrue statement of a material fact or omitted to state any material fact required to be stated therein or necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading; and as of the time of acceptance hereof there is and, as of the Closing Date, there will be no basis for any action, suit, proceeding, inquiry or investigation of the nature described in clauses (i) through (iv) of this sentence.

N. Any certificate signed on behalf of the Community Facilities District by any officer or employee of the Community Facilities District authorized to do so shall be deemed a representation and warranty by the Community Facilities District to the Underwriter on behalf of itself and the Community Facilities District as to the statements made therein.

O. At or prior to the Closing, the Community Facilities District will have duly authorized, executed and delivered the Continuing Disclosure Agreement in substantially the form attached as an appendix to the Official Statement. Based upon a review of its previous undertakings, and except as disclosed in the Preliminary Official Statement, the City and the City Entities (as defined in the Preliminary Official Statement) have not failed to comply in all material respects with any previous undertakings with regard to the Rule to provide annual reports or notices of enumerated events in the last five years. The Community Facilities District has not previously entered into any undertaking pursuant to the Rule.

P. The Community Facilities District will apply the proceeds of the Bonds in accordance with the Indenture and as described in the Preliminary Official Statement and Official Statement.

Q. Until such time as moneys have been set aside in an amount sufficient to pay all then outstanding Bonds at maturity or to the date of redemption if redeemed prior to maturity, plus unpaid interest thereon and premium, if any, to maturity or to the date of redemption if redeemed prior to maturity, the Community Facilities District will faithfully perform and abide by all of the covenants, undertakings and provisions contained in the Indenture.

R. Between the date of this Purchase Agreement and the date of Closing, the Community Facilities District will not offer or issue any bonds, notes or other obligations for borrowed money not previously disclosed to the Underwriter.

S. The City, on behalf of the Community Facilities District, has adopted local debt policies in accordance with Section 8855(i) of the California Government Code.

The Community Facilities District hereby approves the preparation and distribution of the Official Statement, consisting of the Preliminary Official Statement with such changes as are noted thereon and as may be made thereto, with the approval of Bond Counsel, Disclosure Counsel and the Underwriter, from time to time prior to the Closing Date.

The Community Facilities District hereby ratifies any prior use of and authorizes the future use by the Underwriter, in connection with the offering and sale of the Bonds, of the Preliminary Official Statement, the Official Statement, this Purchase Agreement and all information contained

herein, and all other documents, certificates and written statements furnished by the Community Facilities District to the Underwriter in connection with the transactions contemplated by this Purchase Agreement.

The execution and delivery of this Purchase Agreement by the Community Facilities District shall constitute a representation by the Community Facilities District to the Underwriter that the representations and warranties contained in this Section 2 with respect to the Community Facilities District are true as of the date hereof.

3. Conditions to the Obligations of the Underwriter. The obligation of the Underwriter to accept delivery of and pay for the Bonds on the Closing Date shall be subject, at the option of the Underwriter, to the accuracy in all material respects of the representations and warranties on the part of the Community Facilities District contained herein, to the accuracy in all material respects of the statements of the officers and other officials of the Community Facilities District made in any certificates or other documents furnished pursuant to the provisions hereof, to the performance by the Community Facilities District of their obligations to be performed hereunder at or prior to the Closing Date, and in reliance upon the representations and covenants of GDC/CDG Esperanza contained in the certificate(s) delivered as of the Closing Date, and to the following additional conditions:

A. At the Closing Date, the Community Facilities District Resolutions, the Community Facilities District Documents shall be in full force and effect, and shall not have been amended, modified or supplemented, except as may have been agreed to in writing by the Underwriter, and there shall have been taken in connection therewith, with the issuance of the Bonds and with the Bonds, and with the transactions contemplated thereby, and by this Purchase Agreement, all such actions as, in the opinion of Bond Counsel, shall be necessary and appropriate.

B. At the Closing Date, except as described in the Preliminary Official Statement, the City shall not be, in any respect material to the transactions referred to herein or contemplated hereby, in breach of or in default under, any law or administrative rule or regulation of the State of California, the United States of America, or of any department, division, agency or instrumentality of either thereof, or under any applicable court or administrative decree or order, or under any loan agreement, note, resolution, indenture, contract, agreement or other instrument to which the City is a party or is otherwise subject or bound, and the performance of the conditions precedent to be performed hereunder will not conflict with or constitute a breach of or default under any applicable law or administrative rule or regulation of the State of California, the United States of America, or of any department, division, agency or instrumentality of either thereof, or under any applicable court or administrative decree or order, or under any loan agreement, note, resolution, indenture, contract, agreement or other instrument to which the City is a party or is otherwise subject or bound, in any manner which would materially and adversely affect the performance of the conditions precedent to be performed by the City hereunder.

C. At the Closing Date, except as described in the Preliminary Official Statement, the Community Facilities District shall not be, in any respect material to the transactions referred to herein or contemplated hereby, in breach of or in default under, any law or administrative rule or regulation of the State of California, the United States of America, or of any department, division, agency or instrumentality of either thereof, or under any applicable court or administrative decree or order, or under any loan agreement, note, resolution, indenture, contract, agreement or other instrument to which the Community Facilities District is a party or is otherwise subject or

bound, and the performance by the Community Facilities District of its obligations under the Bonds, the Community Facilities District Resolutions, the Indenture, and any other instruments contemplated by any of such documents, and compliance with the provisions of each thereof, or the performance of the conditions precedent to be performed hereunder, will not conflict with or constitute a breach of or default under any applicable law or administrative rule or regulation of the State of California, the United States of America, or of any department, division, agency or instrumentality of either thereof, or under any applicable court or administrative decree or order, or under any loan agreement, note, resolution, indenture, contract, agreement or other instrument to which the Community Facilities District is a party or is otherwise subject or bound, in any manner which would materially and adversely affect the performance by the Community Facilities District of its obligations under the Indenture, the Bonds or the performance of the conditions precedent to be performed by the Community Facilities District hereunder.

D. The information contained in the Official Statement is, as of the Closing Date and as of the date of any supplement or amendment thereto pursuant hereto, true and correct in all material respects and does not, as of the Closing Date or as of the date of any supplement or amendment thereto, contain any untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading.

E. Between the date hereof and the Closing Date, the market price or marketability, at the initial offering prices set forth on the cover page of the Official Statement, of the Bonds or the ability of the Underwriter to enforce contracts for the sale of the Bonds, shall not have been materially adversely affected, in the reasonable judgment of the Underwriter (evidenced by a written notice to the Community Facilities District terminating the obligation of the Underwriter to accept delivery of and pay for the Bonds), by reason of any of the following:

1. Legislation introduced in or enacted (or resolution passed) by the Congress of the United States of America or recommended to the Congress by the President of the United States, the Department of the Treasury, the Internal Revenue Service, or any member of Congress, or favorably reported for passage to either House of Congress by any committee of such House to which such legislation had been referred for consideration, or a decision rendered by a court established under Article III of the Constitution of the United States of America or by the Tax Court of the United States of America, or an order, ruling, regulation (final, temporary or proposed), press release or other form of notice issued or made by or on behalf of the Treasury Department of the United States of America or the Internal Revenue Service, with the purpose or effect, directly or indirectly, of imposing federal income taxation upon such interest as would be received by any owners of the Bonds beyond the extent to which such interest is subject to taxation as of the date hereof;

2. Legislation introduced in or enacted (or resolution passed) by the Congress or an order, decree or injunction issued by any court of competent jurisdiction, or an order, ruling, regulation (final, temporary or proposed), press release or other form of notice issued or made by or on behalf of the Securities and Exchange Commission ("SEC"), or any other governmental agency having jurisdiction of the subject matter, to the effect that obligations of the general character of the Bonds, including any or all underlying arrangements, are not exempt from registration under or other requirements of the Securities Act of 1933, as amended, or that the Indenture is not exempt from qualification under or other requirements of the Trust Indenture Act of 1939, as amended, or that the issuance, offering or sale of obligations of the general character of the Bonds, including any

or all underlying arrangements, as contemplated hereby or by the Official Statement or otherwise is or would be in violation of the federal securities laws as amended and then in effect;

3. A general suspension of trading on the New York Stock Exchange or other major exchange shall be in force, or minimum or maximum prices for trading shall have been fixed and be in force, or maximum ranges for prices for securities shall have been required and be in force on any such exchange, whether by virtue of determination by that exchange or by order of the SEC or any other governmental authority having jurisdiction;

4. The introduction, proposal or enactment of any amendment to the federal or California Constitution or any action by any federal or California court, legislative body, regulatory body or other authority materially adversely affecting the tax status of the Community Facilities District, its property, income, securities (or interest thereon), the validity or enforceability of Special Taxes, or the ability of the Community Facilities District to construct or acquire the improvements as contemplated by the Formation Documents, the Community Facilities District Documents or the Official Statement or the right of any owner of the property within the Community Facilities District to develop such property in the manner described in the Official Statement, or the ability of the Community Facilities District to issue the Bonds as contemplated by the Indenture and the Official Statement;

5. Any event occurring, or information becoming known which, in the judgment of the Underwriter, makes untrue in any material respect any statement or information contained in the Preliminary Official Statement or in the Official Statement, or has the effect that the Preliminary Official Statement or the Official Statement contains any untrue statement of a material fact or omits to state a material fact required to be stated therein or necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading;

6. Any national securities exchange, the Comptroller of the Currency, or any other governmental authority, shall impose as to the Bonds, or obligations of the general character of the Bonds, any material restrictions not now in force, or increase materially those now in force, with respect to the extension of credit by, or the charge to the net capital requirements of, the Underwriter;

7. There shall have occurred (1) an outbreak or escalation of hostilities or the declaration by the United States of a national emergency or war, (2) any other calamity or crisis in the financial markets of the United States or elsewhere, or (3) the sovereign debt rating of the United States is downgraded by any major credit rating agency or a payment default occurs on United States Treasury obligations;

8. Except as disclosed in or contemplated by the Official Statement, any material adverse change in the affairs of the City or Community Facilities District shall have occurred;

9. Any event or circumstance shall exist that either makes untrue or incorrect in any material respect any statement or information in the Official Statement (other than any statement provided by the Underwriter) or is not reflected in the Official Statement but should be reflected therein in order to make the statements therein, in the light of the circumstances under which they were made, not misleading and, in either such event, the Community Facilities District refuses to permit the Official Statement to be supplemented to supply such statement or information, or

the effect of the Official Statement as so supplemented is to materially adversely affect the market price or marketability of the Bonds or the ability of the Underwriter to enforce contracts for the sale of the Bonds;

10. A general banking moratorium shall have been declared by federal or State authorities having jurisdiction and be in force;

11. A material disruption in securities settlement, payment or clearance services affecting the Bonds shall have occurred;

12. Any new restriction on transactions in securities materially affecting the market for securities (including the imposition of any limitation on interest rates) or the extension of credit by, or a charge to the net capital requirements of, underwriters shall have been established by the New York Stock Exchange, the SEC, any other federal or State agency or the Congress of the United States, or by Executive Order;

13. A decision by a court of the United States shall be rendered, or a stop order, release, regulation or no-action letter by or on behalf of the SEC or any other governmental agency having jurisdiction of the subject matter shall have been issued or made, to the effect that the issuance, offering or sale of the Securities, including the underlying obligations as contemplated by this Purchase Agreement or by the Official Statement, or any document relating to the issuance, offering or sale of the Securities, is or would be in violation of any provision of the federal securities laws at the Closing Date, including the Securities Act, the Exchange Act and the Trust Indenture Act;

14. Any proceeding shall have been commenced or be threatened in writing by the Securities and Exchange Commission against the City or the Community Facilities District; or

15. The commencement of any Action.

F. At or prior to the Closing Date, the Underwriter shall have received a counterpart original or certified copy of the following documents, in each case satisfactory in form and substance to the Underwriter:

1. The Official Statement, executed on behalf of the Community Facilities District by an authorized officer;

2. The Indenture, duly executed and delivered by the Community Facilities District and the Trustee;

3. The Community Facilities District Resolutions and the other Formation Documents, and the Community Facilities District Documents, together with a certificate dated as of the Closing Date of the City Clerk to the effect that the Community Facilities District Resolutions and the Ordinance are true, correct and complete copies of the ones duly adopted by the City Council;

4. The Continuing Disclosure Agreement executed and delivered by the Community Facilities District and the Continuing Disclosure Agreement dated the Closing Date (the "Developer Continuing Disclosure Agreement"), executed and delivered by GDC/CDG Esperanza

and Goodwin Consulting Group, Inc. ("Goodwin Consulting Group"), as dissemination agent, substantially in the form attached as an appendix to the Official Statement;

5. An unqualified approving opinion for the Bonds, dated the Closing Date and addressed to the Community Facilities District, of Bond Counsel, to the effect that the Bonds are the valid, legal and binding obligations of the Community Facilities District and that the interest thereon is excluded from gross income for federal income tax purposes and exempt from personal income taxes of the State of California, in substantially the form included as an appendix to the Official Statement, together with a letter of Bond Counsel, dated the Closing Date and addressed to the Underwriter and the Trustee, to the effect that such opinion addressed to the Community Facilities District may be relied upon by the Underwriter and the Trustee to the same extent as if such opinion was addressed to it;

6. A supplemental opinion or opinions of Bond Counsel dated the Closing Date and addressed to the Underwriter to the effect that:

(i) this Purchase Agreement and the Continuing Disclosure Agreement have been duly executed and delivered by the Community Facilities District and, assuming due authorization, execution and delivery by the other parties thereto, constitute the valid and binding obligations of the Community Facilities District, except to the extent that enforceability may be limited by moratorium, bankruptcy, reorganization, insolvency or other similar laws affecting creditors' rights generally or by the exercise of judicial discretion in accordance with general principles of equity or otherwise in appropriate cases and by limitations on legal remedies against public agencies in the State;

(ii) the Bonds are not subject to the registration requirements of the Securities Act of 1933, as amended, and the Indenture is exempt from qualification under the Trust Indenture Act of 1939, as amended;

(iii) the statements contained in the Official Statement under the captions "THE SERIES 2022 BONDS," "SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2022 BONDS," (except information under the captions "Special Taxes" and "Rate and Method of Apportionment" as to which no opinion is expressed), "TAX MATTERS," and Appendix F - "SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE," excluding any material that may be treated as included under such captions by cross-reference or reference to other documents or sources, insofar as such statements expressly summarize certain provisions of the Indenture and certain matters addressed in Bond Counsel's final approving opinion, are accurate in all material respects.

7. A letter, dated the Closing Date and addressed to the Underwriter, of Disclosure Counsel, to the effect that such counsel is not passing upon and has not undertaken to determine independently or to verify the accuracy or completeness of the statements contained in the Preliminary Official Statement or in the Official Statement, and is, therefore, unable to make any representation to the Underwriter in that regard, but on the basis of its participation in conferences with representatives of the City, Best Best & Krieger LLP, as issuer's counsel ("Issuer's Counsel"), Bond Counsel, the appraisal of the taxable properties within the Community Facilities District, dated [INSERT DATE] (the "Appraisal Report"), prepared by Kitty Siino & Associates, Inc. (the "Appraiser"), Empire Economics, Inc, Goodwin Consulting Group, CSG Advisors Incorporated, representatives of the Underwriter and others, during which conferences the content of the

Preliminary Official Statement and the Official Statement and related matters were discussed, and its examination of certain documents, and, in reliance thereon and based on the information made available to it in its role as Disclosure Counsel and its understanding of applicable law, Disclosure Counsel advises the Underwriter as a matter of fact, but not opinion, that no information has come to the attention of the attorneys in the firm working on such matter which has led them to believe that the Preliminary Official Statement as of its date and the date hereof and the Official Statement as of its date and as of the Closing Date (in each case excluding therefrom the financial and statistical data, forecasts, charts, numbers, estimates, projections, assumptions and expressions of opinion included in the Preliminary Official Statement and the Official Statement, information regarding DTC and its book entry system and the information set forth in Appendices A, B, C, D, E, F, G, H and I, as to all of which no opinion is expressed) contained any untrue statement of a material fact or omitted to state a material fact required to be stated therein or necessary to make the statements therein, in light of the circumstances under which they were made, not misleading;

8. A certificate dated the Closing Date and signed by an authorized representative of the Community Facilities District or an authorized designee, on behalf of the Community Facilities District to the effect that: (i) the representations and warranties made by the Community Facilities District contained herein are true and correct in all material respects on and as of the Closing Date with the same effect as if made on the Closing Date; (ii) to the best knowledge of such officer, no event has occurred since the date of the Official Statement which should be disclosed in the Official Statement for the purpose for which it is to be used or which it is necessary to disclose therein in order to make the statements and information therein not misleading in any material respect; (iii) the Community Facilities District has complied with all the agreements and satisfied all the conditions on its part to be satisfied under this Purchase Agreement, the Community Facilities District Resolutions, the Community Facilities District Documents and the Official Statement at or prior to the Closing Date; and (iv) all information in the Official Statement relating to the Community Facilities District (other than information therein provided by the Special Tax Consultant) is true and correct in all material respects as of the date of the Official Statement and as of the Closing Date;

9. An opinion of Issuer's Counsel dated the date of Closing and addressed to the Underwriter, the Trustee and the City, substantially in the form attached hereto as Exhibit D;

10. A certificate dated the Closing Date from the Appraiser addressed to the Community Facilities District and the Underwriter substantially to the effect that (i) the assumptions made in the Appraisal Report are reasonable; the Appraisal Report fairly and accurately described, as of the stated date of value, the market values of the properties in the Community Facilities District that are subject to the Special Taxes, (ii) the Appraiser is not aware of any event or act which occurred since the date of the Appraisal Report which, in its opinion, would materially and adversely affect the conclusions as to the market value of the appraised property in the Community Facilities District, (iii) the Appraiser consents to the reproduction of the Appraisal Report as an appendix to the Preliminary Official Statement and the final Official Statement, each with respect to the Bonds, and to the references to the Appraiser and the Appraisal Report made in the Preliminary Official Statement and the Official Statement, (iv) the Appraisal Report complies with the Appraisal Standards for Land-Secured Financings issued by the California Debt and Investment Advisory Commission dated July, 2004, (v) a true and correct copy of the Appraisal Report is attached as an appendix to the Preliminary Official Statement and the Official Statement; and (vi) neither the Appraisal Report nor the information in the Preliminary Official Statement or the Official Statement

referring to it contains any untrue statement of a material fact or omits to state a material fact necessary in order to make the statements therein, in light of the circumstances under which they were made, not misleading;

11. A certificate dated the Closing Date from Goodwin Consulting Group addressed to the Community Facilities District and the Underwriter to the effect that: (i) the Special Tax, if levied and collected in the maximum amounts permitted pursuant to the Amended and Restated Rate and Method of Apportionment of Special Taxes of the Community Facilities District, as of the Closing Date, would generate at least 110% of the annual debt service payable with respect to the related issue of Bonds, net of estimated Administrative Expenses, based on such assumptions and qualifications as shall be acceptable to the Underwriter; (ii) the statements in the Preliminary Official Statement and the Official Statement provided by Goodwin Consulting Group concerning Special Taxes in the Community Facilities District and all information supplied by it for use in the Official Statement were as of the date of the Preliminary Official Statement, the date of the Official Statement and are as of the Closing Date true and correct, and do not contain any untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in light of the circumstances under which they were made, not misleading; (iii) all information supplied by Goodwin Consulting Group to the Appraiser is true and correct as of the date of the Preliminary Official Statement and the date of the Official Statement and as of the Closing Date, based on such assumptions as may have been supplied by it; and (iv) the information contained in the Appraisal Report with respect to taxes and tax rates applicable, and projected to be applicable, to the property in the Community Facilities District is consistent with such information provided by Goodwin Consulting Group to the Appraiser, which information so provided was based on information obtained by Goodwin Consulting Group from the Community Facilities District, GDC/CDG Esperanza, and the City;

12. Certified copies of the general resolution of the Trustee authorizing the execution and delivery of certain documents by certain officers of the Trustee, which resolution authorizes the execution of the Indenture and the authentication of the Bonds;

13. A certificate of the Trustee, addressed to the Underwriter, and the Community Facilities District dated the Closing Date, to the effect that: (i) the Trustee is authorized to carry out corporate trust powers, and has full power and authority to perform its duties under the Indenture and the Continuing Disclosure Agreement; (ii) the Trustee is duly authorized to execute and deliver the Indenture and the Continuing Disclosure Agreement, to accept the obligations created by the Indenture and the Continuing Disclosure Agreement and to authenticate the Bonds pursuant to the terms of the Indenture; (iii) no consent, approval, authorization or other action by any governmental or regulatory authority having jurisdiction over the Trustee that has not been obtained is or will be required for the authentication of the Bonds or the consummation by the Trustee of the other transactions contemplated to be performed by the Trustee in connection with the authentication of the Bonds and the acceptance and performance of the obligations created by the Indenture; and (iv) to the best of its knowledge, compliance with the terms of the Indenture will not conflict with, or result in a violation or breach of, or constitute a default under, any material agreement or material instrument to which the Trustee is a party or by which it is bound, or any law or any rule, regulation, order or decree of any court or governmental agency or body having jurisdiction over the Trustee or any of its activities or properties;

14. An opinion of counsel to the Trustee dated the Closing Date, addressed to the Underwriter, and the Community Facilities District to the effect that (i) the Trustee

is a national banking association duly organized and validly existing under the laws of the jurisdiction of its organization and has the corporate power to execute and deliver the Indenture, the Continuing Disclosure Agreement, and any other documentation relating to the Indenture, (ii) the execution and delivery by the Trustee of the Indenture, the Continuing Disclosure Agreement, and any other documentation relating to the Indenture, and its performance of its obligations under the Indenture, have been and are as of the date hereof duly authorized by all necessary corporate action, (iii) the Indenture and the Continuing Disclosure Agreement have been duly executed and delivered and constitute the valid and legally binding obligations of the Trustee enforceable against it in accordance with their terms except as such enforceability may be limited by applicable bankruptcy, insolvency, reorganization, moratorium or similar laws affecting the enforcement of creditors' rights generally and by general principles of equity (regardless of whether enforcement is sought as a proceeding in equity or at law), and (iv) the Bonds have been duly authenticated and delivered by the Trustee;

15. A certificate of the Community Facilities District dated the Closing Date, in a form acceptable to Bond Counsel and the Underwriter, that the Bonds are not arbitrage bonds within the meaning of Section 148 of the Internal Revenue Code of 1986, as amended;

16. From counsel to GDC/CDG Esperanza, (i) a negative assurance letter of such counsel dated the date of the Closing, in form and substance acceptable to the Underwriter and Bond Counsel; and (ii) an opinion of such counsel, dated the date of the Closing, in form and substance acceptable to the Underwriter and Bond Counsel, to the effect that the Developer Continuing Disclosure Agreement has been duly authorized, executed and delivered by GDC/CDG Esperanza;

17. A Letter of Representations from GDC/CDG Esperanza dated the date of printing the Preliminary Official Statement, substantially in the form attached hereto as Exhibit B;

18. A Closing Certificate from GDC/CDG Esperanza dated the Closing Date, substantially in the form attached hereto as Exhibit C or as such Closing Certificate may be modified with the approval of the Underwriter and Disclosure Counsel;

19. A certificate dated the Closing Date from Empire Economics, Inc. addressed to the Community Facilities District and the Underwriter to the effect that the statements in the Official Statement provided by Empire Economics, Inc. and all information supplied by it for use in the Official Statement were as of the date of the Official Statement and are as of the Closing Date true and correct, and do not contain any untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in light of the circumstances under which they were made, not misleading;

20. An opinion of Jones Hall, A Professional Law Corporation, counsel to the Underwriter, dated the date of Closing and addressed to the Underwriter in form and substance acceptable to the Underwriter;

21. A certificate of CSG Advisors Incorporated, the City's municipal advisor (the "Municipal Advisor") to the effect that the Municipal Advisor has participated in the preparation of the Preliminary Official Statement and the Official Statement and nothing has come to the attention of the Municipal Advisor which would lead it to believe that the Preliminary Official

Statement or the Official Statement contain any untrue statement of a material fact or omits to state a fact necessary to make the statements made therein, in the light of the circumstances under which they were made, not misleading; and

22. Such additional legal opinions, certificates, instruments and other documents as the Underwriter may reasonably request to evidence the truth and accuracy, as of the date hereof and as of the Closing Date, of the material representations and warranties of the Community Facilities District contained herein, and of the statements and information contained in the Official Statement and the due performance or satisfaction by the Community Facilities District at or prior to the Closing of all agreements then to be performed and all conditions then to be satisfied by the Community Facilities District in connection with the transactions contemplated hereby and by the Indenture and the Official Statement.

If the Community Facilities District shall be unable to satisfy the conditions to the obligations of the Underwriter to purchase, accept delivery of and pay for the Bonds contained in this Purchase Agreement, or if the obligations of the Underwriter to purchase, accept delivery of and pay for the Bonds shall be terminated for any reason permitted by this Purchase Agreement, this Purchase Agreement shall terminate and neither the Community Facilities District nor the Underwriter shall be under any further obligation hereunder, except that the respective obligations of the Underwriter and the Community Facilities District set forth in Section 5 hereof shall continue in full force and effect.

4. Establishment of Issue Price.

A. The Underwriter agrees to assist the Community Facilities District in establishing the issue price of the Bonds and shall execute and deliver to the Community Facilities District at Closing an "issue price" or similar certificate, together with the supporting pricing wires or equivalent communications, substantially in the form attached hereto as Exhibit E, with such modifications as may be appropriate or necessary, in the reasonable judgment of the Underwriter, the Community Facilities District and Bond Counsel (as defined herein), to accurately reflect, as applicable, the sales price or prices or the initial offering price or prices to the public of the Bonds. All actions to be taken by the Community Facilities District under this section to establish the issue price of the Bonds may be taken on behalf of the Community Facilities District by the Municipal Advisor and any notice or report to be provided to the Community Facilities District may be provided to the Community Facilities District's Municipal Advisor.

B. Except as otherwise set forth in Exhibit A attached hereto, the Community Facilities District will treat the first price at which 10% of each maturity of the Bonds (the "10% test") is sold to the public as the issue price of that maturity . At or promptly after the execution of this Purchase Agreement, the Underwriter shall report to the Community Facilities District the price or prices at which it has sold to the public each maturity of Bonds. If at that time the 10% test has not been satisfied as to any maturity of the Bonds, the Underwriter agrees to promptly report to the Community Facilities District the prices at which it sells the unsold Bonds of that maturity to the public. That reporting obligation shall continue, whether or not the Closing Date (as defined herein) has occurred, until the 10% test has been satisfied as to the Bonds of that maturity or until all Bonds of that maturity have been sold to the public, provided that the Underwriter's reporting obligation after the date of the Closing may be at reasonable periodic intervals or otherwise upon request of the Community Facilities District or Bond Counsel. For purposes of this Section, if Bonds mature on the same date but have different interest rates, each separate CUSIP number within that maturity will be treated as a separate maturity of the Bonds. For clarity, and notwithstanding any other condition to

Closing set forth in this Purchase Agreement, the sale of 10% of each maturity of the Bonds to the public prior to the Closing Date shall not be a condition to Closing.

C. The Underwriter confirms that it has offered the Bonds to the public on or before the date of this Purchase Agreement at the offering price or prices (the "initial offering price"), or at the corresponding yield or yields, set forth in Exhibit A attached hereto, except as otherwise set forth therein. Exhibit A also sets forth, as of the date of this Purchase Agreement, the maturities, if any, of the Bonds for which the 10% test has not been satisfied and for which the Community Facilities District and the Underwriter agree that the restrictions set forth in the next sentence shall apply, which will allow the Community Facilities District to treat the initial offering price to the public of each such maturity as of the sale date as the issue price of that maturity (the "hold-the-offering-price rule"). So long as the hold-the-offering-price rule remains applicable to any maturity of the Bonds, the Underwriter will neither offer nor sell unsold Bonds of that maturity to any person at a price that is higher than the initial offering price to the public during the period starting on the sale date and ending on the earlier of the following:

(1) the close of the fifth (5th) business day after the sale date; or

(2) the date on which the Underwriter has sold at least 10% of that maturity of the Bonds to the public at a price that is no higher than the initial offering price to the public.

The Underwriter will advise the Community Facilities District promptly after the close of the fifth (5th) business day after the sale date whether it has sold 10% of that maturity of the Bonds to the public at a price that is no higher than the initial offering price to the public.

D. The Underwriter confirms that:

(1) any selling group agreement and any third-party distribution agreement relating to the initial sale of the Bonds to the public, together with the related pricing wires, contains or will contain language obligating each dealer who is a member of the selling group and each broker-dealer that is a party to such third-party distribution agreement, as applicable:

(a)(i) to report the prices at which it sells to the public the unsold Bonds of each maturity allocated to it, whether or not the Closing has occurred, until either all Bonds of that maturity allocated to it have been sold or it is notified by the Underwriter that the 10% test has been satisfied as to the Bonds of that maturity, provided that the reporting obligation after the date of the Closing may be at reasonable periodic intervals or otherwise upon request of the Underwriter, and (ii) to comply with the hold-the-offering-price rule, if applicable, in each case if and for so long as directed by the Underwriter,

(b) to promptly notify the Underwriter of any sales of Bonds that, to its knowledge, are made to a purchaser who is a related party to an underwriter participating in the initial sale of the Bonds to the public (each such term being used as defined below), and

(c) to acknowledge that, unless otherwise advised by the dealer or broker-dealer, the Underwriter shall assume that each order submitted by the dealer or broker-dealer is a sale to the public.

(2) any selling group agreement relating to the initial sale of the Bonds to the public, together with the related pricing wires, contains or will contain language obligating each dealer that is a party to a third-party distribution agreement to be employed in connection with the initial sale of the Bonds to the public to require each broker-dealer that is a party to such third-party distribution agreement to (A) report the prices at which it sells to the public the unsold Bonds of each maturity allocated to it, whether or not the Closing has occurred, until either all Bonds of that maturity allocated to it have been sold or it is notified by the Underwriter or the dealer that the 10% test has been satisfied as to the Bonds of that maturity, provided that the reporting obligation after the date of the Closing may be at reasonable periodic intervals or otherwise upon request of the Underwriter or the dealer, and (B) comply with the hold-the-offering-price rule, if applicable, if and for so long as directed by the Underwriter or the dealer and as set forth in the related pricing wires.

E. The Community Facilities District acknowledges that, in making the representations set forth in this subsection, the Underwriter will rely on (i) in the event a selling group has been created in connection with the initial sale of the Bonds to the public, the agreement of each dealer who is a member of the selling group to comply with the requirements for establishing the issue price of the Bonds, including, but not limited to, its agreement to comply with the hold-the-offering-price rule, if applicable to the Bonds, as set forth in a selling group agreement and the related pricing wires, and (ii) in the event that a third-party distribution agreement was employed in connection with the initial sale of the Bonds to the public, the agreement of each broker-dealer that is a party to such agreement to comply with the requirements for establishing the issue price of the Bonds, including, but not limited to, its agreement to comply with the hold-the-offering-price rule, if applicable to the Bonds, as set forth in the third-party distribution agreement and the related pricing wires. The Community Facilities District further acknowledges that the Underwriter shall not be liable for the failure of any dealer who is a member of a selling group, or of any broker-dealer that is a party to a third-party distribution agreement, to comply with its corresponding agreement to comply with the requirements for establishing the issue price of the Bonds, including, but not limited to, its agreement to comply with the hold-the-offering-price rule if applicable to the Bonds.

F. The Underwriter acknowledges that sales of any Bonds to any person that is a related party to an underwriter participating in the initial sale of the Bonds to the public (each such term being used as defined below) shall not constitute sales to the public for purposes of this section. Further, for purposes of this section:

(1) "public" means any person other than an underwriter or a related party;

(2) "underwriter" means (A) any person that agrees pursuant to a written contract with the Community Facilities District (or with the lead underwriter to form an underwriting syndicate) to participate in the initial sale of the Bonds to the public and (B) any person that agrees pursuant to a written contract directly or indirectly with a person described in clause (A) to participate in the initial sale of the Bonds to

the public (including a member of a selling group or a party to a third-party distribution agreement participating in the initial sale of the Bonds to the public);

(3) a purchaser of any of the Bonds is a "related party" to an underwriter if the underwriter and the purchaser are subject, directly or indirectly, to (i) more than 50% common ownership of the voting power or the total value of their stock, if both entities are corporations (including direct ownership by one corporation of another), (ii) more than 50% common ownership of their capital interests or profits interests, if both entities are partnerships (including direct ownership by one partnership of another), or (iii) more than 50% common ownership of the value of the outstanding stock of the corporation or the capital interests or profit interests of the partnership, as applicable, if one entity is a corporation and the other entity is a partnership (including direct ownership of the applicable stock or interests by one entity of the other); and

(4) "sale date" means the date of execution of this Purchase Agreement by all parties.

5. Expenses. Whether or not the Bonds are delivered to the Underwriter as set forth herein:

A. The Underwriter shall be under no obligation to pay, and the Community Facilities District shall pay or cause to be paid (out of any legally available funds of the Community Facilities District) all expenses incident to the performance of the Community Facilities District's obligations hereunder, including, but not limited to, the cost of printing, engraving and delivering the Bonds to DTC, the cost of preparation, printing, distributing and delivering of the Indenture, the Preliminary Official Statement, the Official Statement, any amendment or supplement to the Preliminary Official Statement or the Official Statement and this Purchase Agreement, and all other agreements and documents contemplated hereby (and drafts of any thereof) in such reasonable quantities as requested by the Underwriter; and the fees and disbursements of the Trustee, Bond Counsel, Disclosure Counsel and any financial advisors, special tax consultants, appraisers, accountants, engineers or any other experts or consultants the City or the Community Facilities District may have retained in connection with the Bonds; and

B. The Community Facilities District shall be under no obligation to pay, and the Underwriter shall pay, any fees of the California Debt and Investment Advisory Commission, the cost of preparation of any "blue sky" or legal investment memoranda and this Purchase Agreement; expenses to qualify the Bonds for sale under any "blue sky" or other state securities laws; and all other expenses incurred by the Underwriter in connection with its public offering and distribution of the Bonds (except those specifically enumerated in paragraph (a) of this section), including the fees and disbursements of its counsel, meals, transportation and lodging (but not entertainment expenses), and any advertising expenses in connection with the public offering of the Bonds.

6. Notices. Any notice or other communication to be given to the Community Facilities District or the Community Facilities District under this Purchase Agreement may be given by delivering the same in writing to the City of Ontario, 303 East "B" Street, Ontario, California 91764, Attention: City Manager; any notice or other communication to be given to the Underwriter under this Purchase Agreement may be given by delivering the same in writing to Stifel, Nicolaus &

Company, Incorporated, One Montgomery Street, 35th Floor, San Francisco, California 94104, Attention: Sara Brown.

7. Parties In Interest. This Purchase Agreement is made solely for the benefit of the Community Facilities District and Underwriter (including any successors or assignees of the Underwriter) and no other person shall acquire or have any right hereunder or by virtue hereof.

8. Survival of Representations and Warranties. The representations and warranties of the Community Facilities District under this Purchase Agreement shall not be deemed to have been discharged, satisfied or otherwise rendered void by reason of the Closing and regardless of any investigations made by or on behalf of the Underwriter (or statements as to the results of such investigations) concerning such representations and statements of the Community Facilities District and regardless of delivery of and payment for the Bonds.

9. Execution in Counterparts. This Purchase Agreement may be executed by the parties hereto in separate counterparts, each of which when so executed and delivered shall be an original, but all such counterparts shall together constitute but one and the same instrument.

10. Effective. This Purchase Agreement shall become effective and binding upon the respective parties hereto upon the execution of the acceptance hereof by the Community Facilities District and shall be valid and enforceable as of the time of such acceptance.

11. No Prior Agreements. This Purchase Agreement supersedes and replaces all prior negotiations, agreements and understanding among the parties hereto in relation to the sale of the Bonds by the Community Facilities District.

12. Governing Law. This Purchase Agreement shall be governed by the laws of the State of California.

13. Effective Date. This Purchase Agreement shall become effective and binding upon the respective parties hereto upon the execution of the acceptance hereof by the Community Facilities District and shall be valid and enforceable as of the time of such acceptance.

Very truly yours,

STIFEL, NICOLAUS & COMPANY,
INCORPORATED

By: _____
Its: Managing Director

The foregoing is hereby agreed to and
accepted as of the date first above written:

CITY OF ONTARIO COMMUNITY
FACILITIES DISTRICT NO. 54
(ESPERANZA FACILITIES)

By: _____
Authorized Officer

Time of Execution: _____ California time

EXHIBIT A

CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 54
(ESPERANZA FACILITIES)
SPECIAL TAX BONDS, SERIES 2022

MATURITY SCHEDULE

Maturity (September 1)	Principal Amount	Interest Rate	Yield	Price	10% Test Satisfied*	10% Test Not Satisfied	Subject to Hold-The-Offering-Price Rule

T: Term Bond.
C: Priced to optional redemption date of September 1, 20__, at ___%.
* At the time of execution of this Purchase Agreement and assuming orders are confirmed immediately after the execution of this Purchase Agreement.

REDEMPTION PROVISIONS

Optional Redemption. The Bonds maturing on and after September 1, 20__, shall be subject to optional redemption, in whole, or in part in Authorized Denominations, on any Interest Payment Date on or after September 1, 20__, from any source of available funds, at the following respective Redemption Prices (expressed as percentages of the principal amount of the Bonds to be redeemed), plus accrued interest thereon to the date of redemption:

Redemption Dates	Redemption Price
September 1, 20__ and March 1, 20__	103%
September 1, 20__ and March 1, 20__	102
September 1, 20__ and March 1, 20__	101
September 1, 20__ and any Interest Payment Date thereafter	100

Mandatory Redemption from Special Tax Prepayments. The Bonds shall be subject to mandatory redemption, in whole, or in part in Authorized Denominations, on any Interest Payment Date, from and to the extent of prepaid Special Taxes required to be applied thereto pursuant to the Indenture and any amount required to be applied thereto pursuant to the Indenture, at the following respective Redemption Prices (expressed as percentages of the principal amount of the Bonds to be redeemed), plus accrued interest thereon to the date of redemption:

Redemption Dates	Redemption Price
September 1, 2022 through March 1, 20__	103%
September 1, 20__ and March 1, 20__	102
September 1, 20__ and March 1, 20__	101
September 1, 20__ and any Interest Payment Date thereafter	100

Mandatory Sinking Fund Redemption. The Bonds maturing September 1, 20__ shall be subject to mandatory sinking fund redemption, in part, on September 1 in each year, commencing September 1, 20__ at a Redemption Price equal to the principal amount of the Bonds maturing September 1, 20__ to be redeemed, without premium, plus accrued interest thereon to the date of redemption, in the aggregate respective principal amounts in the respective years as follows:

Sinking Fund Redemption Date (September 1)	Principal Amount to be Redeemed

(Maturity)

The Bonds maturing September 1, 20__ shall be subject to mandatory sinking fund redemption, in part, on September 1 in each year, commencing September 1, 20__ at a Redemption Price equal to the principal amount of the Bonds maturing September 1, 20__ to be redeemed,

without premium, plus accrued interest thereon to the date of redemption, in the aggregate respective principal amounts in the respective years as follows:

Sinking Fund Redemption Date (September 1)	Principal Amount to be Redeemed
(Maturity)	

EXHIBIT B-1

CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 54
(ESPERANZA FACILITIES)
SPECIAL TAX BONDS, SERIES 2022

LETTER OF REPRESENTATIONS OF
GDC/CDG ESPERANZA PA 4 VENTURE, L.P.

[POS Date]

City of Ontario Community Facilities District
No. 54 (Esperanza Facilities)
303 East B Street
Ontario, California 91764

Stifel, Nicolaus & Company, Incorporated
One Montgomery Street, 35th Floor
San Francisco, California 94104

Ladies and Gentlemen:

Reference is made to the City of Ontario Community Facilities District No. 54 (Esperanza Facilities) Special Tax Bonds, Series 2022 (the "**Bonds**") and to the Bond Purchase Agreement to be entered into in connection therewith (the "**Bond Purchase Agreement**"). This Letter of Representations of GDC/CDG Esperanza PA 4 Venture, L.P. (the "**Letter of Representations**") is delivered pursuant to and in satisfaction of Section 3(F)(17) of the Bond Purchase Agreement. Capitalized terms used herein and not otherwise defined have the meanings ascribed to them in the Bond Purchase Agreement.

The undersigned certifies that he or she is familiar with the facts herein certified and is authorized and qualified to certify the same as an authorized officer or representative of GDC/CDG Esperanza PA 4 Venture, L.P., a Delaware limited partnership (the "**Developer**"), and the undersigned, on behalf of the Developer, further certifies as follows:

1. Developer is duly organized and validly existing under the laws of the State of Delaware and has all requisite right, power and authority (i) to execute and deliver this Letter of Representations, and (ii) to develop its property in the City of Ontario Community Facilities District No. 54 (Esperanza Facilities) (the "**Community Facilities District**") as described in the Preliminary Official Statement.

2. As set forth in the Preliminary Official Statement, title to a certain portion of the property within the Community Facilities District is held in the name of the Developer (herein, the "**Property**"). The undersigned, on behalf of the Developer, makes the

representations herein with respect to all such Property. Except as otherwise described in the Preliminary Official Statement, the Developer's current expectation is that the Developer shall remain the party responsible for the construction and sale of homes within the Property. Except as disclosed in the Preliminary Official Statement, the Developer has not entered into an agreement for development or management of the Property by any other entity, except such subcontracts, consultant agreements and similar agreements for land development activities associated with the Developer's development plan as are entered into in the ordinary course of business.

3. Except as set forth in the Preliminary Official Statement, no action, suit, proceeding, inquiry or investigation at law or in equity, before or by any court, regulatory agency, public board or body is pending against the Developer (with proper service of process to the Developer having been accomplished) or, to the Actual Knowledge of the Undersigned,[1] is pending against any current Affiliate[2] (with proper service of process to such Affiliate having been accomplished) or to the Actual Knowledge of the Undersigned is threatened in writing against the Developer or any such Affiliate (a) to restrain or enjoin the collection of special taxes levied on the Property by the Community Facilities District (the "**Special Taxes**") or other sums pledged or to be pledged to pay the principal of and interest on the Bonds (e.g., the reserve fund established under the Indenture (herein, the "**Reserve Fund**")), (b) to restrain or enjoin the development of the Property as described in the Preliminary Official Statement, (c) to materially adversely affect the ability of the Developer to perform its obligations under the Continuing Disclosure Certificate (as hereinafter defined), (d) in any way contesting or affecting the validity of the Special Taxes, or (e) which is reasonably likely to materially and adversely affect the Developer's ability to develop and sell the Property as described in the Preliminary Official Statement or to pay the Special Taxes due with respect to the Property (to the extent the responsibility of the Developer) prior to delinquency.

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1 "**Actual Knowledge of the Undersigned**" means the actual (as opposed to constructive) knowledge that the individual signing on behalf of the Developer currently has as of the date of this Letter of Representations or has obtained through (i) interviews with such current officers and responsible employees of the Developer and its Affiliates as the undersigned has determined are reasonably likely, in the ordinary course of their respective duties, to have knowledge of the matters set forth in this Letter of Representations, and/or (ii) review of documents that were reasonably available to the undersigned and which the undersigned has reasonably deemed necessary for the undersigned to obtain knowledge of the matters set forth in this Letter of Representations. The undersigned has not conducted any extraordinary inspection or inquiry other than such inspections or inquiries as are prudent and customary in connection with the ordinary course of the Developer's current business and operations. Individuals who are no longer employees of the Developer and its Affiliates have not been contacted.

2 "**Affiliate**" means, with respect to the Developer, any other Person (i) who directly, or indirectly through one or more intermediaries, is currently controlling, controlled by or under common control with the Developer, and (ii) for whom information, including financial information or operating data, concerning such Person is material to potential investors in their evaluation of the Community Facilities District and investment decision regarding the Bonds (i.e., information relevant to (a) the Developer's development plans with respect to the Property and ability to pay its Special Taxes on the Property (to the extent the responsibility of the Developer) prior to delinquency, or (b) such Person's assets or funds that would materially affect the Developer's ability to develop the Property as described in the Preliminary Official Statement or to pay its Special Taxes on the Property). "**Person**" means an individual, a corporation, a partnership, a limited liability company, an association, a joint stock company, a trust, any unincorporated organization or a government or political subdivision thereof. For purposes hereof, the term "**control**" (including the terms "**controlling**," "**controlled by**" or "**under common control with**") means the possession, direct or indirect, of the power to direct or cause the direction of the management and policies of a Person, whether through the ownership of voting securities, by contract or otherwise.

4. As of the date of the Preliminary Official Statement, to the Actual Knowledge of the Undersigned, the information contained therein solely with respect to the Developer, its Affiliates, the proposed development of the Property, ownership of the Property, the Developer's development plan, the Developer's financing plan, the Developer's lenders, if any, and contractual arrangements of the Developer or any Affiliates (including, if material to the Developer's development plan or the Developer's financing plan, other loans of such Affiliates) as set forth under the sections of the Preliminary Official Statement captioned "PROPERTY OWNERSHIP AND THE DEVELOPMENT" and "CONTINUING DISCLOSURE – Developer Continuing Disclosure Certificate" (but in all cases under all captions excluding therefrom (i) information regarding the Appraisal Report (as defined herein), market value ratios and annual special tax ratios, and (ii) information which is identified as having been provided by a source other than the Developer), is true and correct in all material respects and did not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading.

5. Except as described in the Preliminary Official Statement, there are no material loans outstanding and unpaid and no material lines of credit of the Developer or its Affiliates, that are secured by an interest in the Property. Neither the Developer nor, to the Actual Knowledge of the Undersigned, any of its Affiliates is currently in material default on any loans, lines of credit or other obligation related to the development of the Property or any other project which default is reasonably likely to materially and adversely affect the Developer's ability to develop the Property as described in the Preliminary Official Statement or to pay the Special Taxes due with respect to the Property (to the extent the responsibility of the Developer) prior to delinquency.

6. To the Actual Knowledge of the Undersigned, other than as disclosed in the Preliminary Official Statement, the Developer is not aware that any of the Property has a current liability with respect to the presence of a substance presently classified as hazardous under the federal Comprehensive Environmental Response, Compensation and Liability Act of 1980 or applicable California law or is adversely affected by the presence of endangered or threatened species or habitat for endangered or threatened species.

7. The Developer covenants that, while the Bonds or any refunding obligations related thereto are outstanding, the Developer and its Affiliates which it controls will not bring any action, suit, proceeding, inquiry or investigation at law or in equity, before any court, regulatory agency, public board or body, that in any way seeks to challenge or overturn the formation of the Community Facilities District, to challenge the adoption of the ordinance of the Community Facilities District levying Special Taxes within the Community Facilities District, to invalidate the Community Facilities District or any of the Bonds or any refunding bonds related thereto, or to invalidate the special tax liens imposed under Section 3115.5 of the Streets and Highways Code based on recordation of the notices of special tax lien relating thereto. The foregoing covenant shall not prevent the Developer in any way from bringing any other action, suit, proceeding, inquiry or investigation at law or in equity, before any court, regulatory agency, public board or body including, without limitation, (a) an action or suit contending that the Special Tax has not been levied in accordance with the methodologies contained in the Rate and Method of Apportionment of Special Taxes pursuant to which Special Taxes are levied, (b) an action or suit with respect to the application or use of the Special Taxes levied and collected or (c) an action or suit to enforce

the obligations of the City and/or the Community Facilities District under the Community Facilities District Resolutions, the Ordinance, the Indenture, or any other agreements among the Developer, an Affiliate, the City and/or the Community Facilities District or to which the Developer or an Affiliate is a party or beneficiary.

8. The Developer consents to the issuance of the Bonds. The Developer acknowledges and agrees that the proceeds of the Bonds will be used as described in the Preliminary Official Statement.

9. The Developer intends to comply with the provision of the Mello-Roos Community Facilities Act of 1982, as amended relating to the Notice of Special Tax described in Government Code Section 53341.5 in connection with the sale of the Property, or portions thereof.

10. To the Actual Knowledge of the Undersigned, the Developer is able to pay its bills as they become due and no legal proceedings are pending against the Developer (with proper service of process having been accomplished) or, to the Actual Knowledge of the Undersigned, threatened in writing in which the Developer may be adjudicated as bankrupt or discharged from any and all of its debts or obligations, or granted an extension of time to pay its debts or obligations, or be allowed to reorganize or readjust its debts, or be subject to control or supervision of the Federal Deposit Insurance Corporation.

11. The Developer agrees to execute at Closing the Continuing Disclosure Certificate, substantially in the form attached as Appendix H to the Preliminary Official Statement (the "**Continuing Disclosure Certificate**"), with such additional changes as may be agreed to by the Developer and the Underwriter. Except as disclosed in the Preliminary Official Statement, to the Actual Knowledge of the Undersigned, the Developer is not aware of any material failures by it or any entity under managerial control of the Developer to comply in all material respects with previous continuing disclosure undertakings in a written certificate or agreement executed by it or an entity under the managerial control of the Developer to provide periodic continuing disclosure reports or notices of material events respecting securities offerings in California within the past five years.

12. To the Actual Knowledge of the Undersigned, execution and delivery of the Continuing Disclosure Certificate, and the performance by the Developer of its obligations under the Continuing Disclosure Certificate, will not conflict with or constitute a breach of or default under any loans, lines of credit, agreements, or other contractual or financial obligations of the Developer, or any applicable law, regulation, judgment or decree.

13. To the Actual Knowledge of the Undersigned, Affiliates of the Developer are able to pay their bills as they become due and no legal proceedings are pending against any Affiliate of the Developer (with proper service of process having been accomplished) or to the Actual Knowledge of the Undersigned, threatened in writing in which the Affiliates of the Developer may be adjudicated as bankrupt or discharged from any or all of their debts or obligations, or granted an extension of time to pay their debt or obligations, or be allowed to reorganize or readjust their debts or obligations, or be subject to control or supervision of the Federal Deposit Insurance Corporation which could have a materially adverse impact on the ability of the Developer to develop the Property as described in the Preliminary Official Statement, to perform its obligations under the Continuing Disclosure Certificate, or to pay

the Special Taxes or ad valorem tax obligations with respect to the portion of the Property then owned by the Developer (to the extent the responsibility of the Developer) prior to delinquency.

14. The Developer has been developing or has been involved in the development of numerous projects over an extended period of time. It is likely that the Developer and its Affiliates have been delinquent at one time or another in the payment of ad valorem property taxes, special assessments or special taxes. However, to the Actual Knowledge of the Undersigned, during the last five years, neither the Developer nor any current Affiliate has, during the period of its ownership, been delinquent to any material extent in the payment of any *ad valorem* property tax, special assessment or special tax on property included within the boundaries of a community facilities district or an assessment district in California that (a) caused a draw on a reserve fund relating to such assessment district or community facilities district financing or (b) resulted in a foreclosure action being commenced against the Developer or its Affiliates in a court of law.

15. The Developer has not filed for the reassessment of the assessed value of any portions of the Property, other than in connection with the sale of homes to individual homebuyers.

16. To the Actual Knowledge of the Undersigned, there are no claims, disputes, suits, actions or contingent liabilities by and among the Developer, its Affiliates or any contractors working on the development of the Property which is reasonably likely to materially and adversely affect the development of the Property as described in the Preliminary Official Statement, the performance of its obligations under the Continuing Disclosure Certificate , or the payment of the Special Taxes due with respect to the Property (to the extent the responsibility of the Developer) prior to delinquency.

17. Based upon the current development plans, including, without limitation, the current budget and subject to economic conditions and risks generally inherent in the development of real property, including, but not limited to, the risks described in the Preliminary Official Statement under the section entitled "SPECIAL RISK FACTORS," the Developer presently anticipates that it will have sufficient funds to develop the Property as described in the Preliminary Official Statement and to pay Special Taxes levied against the Property (to the extent the responsibility of the Developer) prior to delinquency and does not anticipate that the City or the Community Facilities District will be required to resort to a draw on the Reserve Fund for payment of principal of or interest on the Bonds due to the Developer's nonpayment of Special Taxes. However, neither the Developer nor any of its Affiliates are obligated to make any additional capital contribution or loan to the Developer at any time, and the Developer reserves the right to change its development plans and financing plans for the Property at any time without notice.

18. An appraisal of the taxable Property within the Community Facilities District, dated **[INSERT DATE]** (the "**Appraisal Report**"), was prepared by Kitty Siino & Associates, Inc. (the "**Appraiser**"). The Appraisal Report estimates the market value of the taxable Property within the Community Facilities District as of February 1, 2022 (the "**Date of Value**"). To the Actual Knowledge of the Undersigned, all information submitted by, or on behalf of and authorized by, the Developer to the Appraiser and contained in the sections

of the Appraisal Report highlighted in yellow or circled in Exhibit A attached hereto, was true and correct in all material respects as of the Date of Value.

19. Solely as to the limited information described in the sections of the Preliminary Official Statement indicated in Paragraph 4 herein (and subject to the limitations and exclusions set forth in Paragraph 4), the Developer agrees to indemnify and hold harmless, to the extent permitted by law, the City, the Community Facilities District, and their officials and employees, and each Person, if any, who controls any of the foregoing within the meaning of Section 15 of the Securities Act of 1933, as amended, or of Section 20 of the Securities Exchange Act of 1934, as amended (each, an "**Indemnified Party**" and, collectively, the "**Indemnified Parties**"), against any and all losses, claims, damages or liabilities, joint or several, to which such Indemnified Party may become subject under any statute or at law or in equity and shall reimburse any such Indemnified Party for any reasonable legal or other expense incurred by it in connection with investigating any such claim against it and defending any such action, insofar as and solely to the extent such losses, claims, damages, liabilities or actions, or legal or other expenses, arise out of or are based upon any untrue statement or alleged untrue statement of a material fact or the omission or alleged omission of a material fact by the Developer in the above-referenced information in the Preliminary Official Statement, as of its date, necessary to make the statements made by the Developer contained therein, in light of the circumstances under which they were made not misleading. This indemnity provision shall not be construed as a limitation on any other liability which the Developer may otherwise have to any Indemnified Party, *provided* that in no event shall the Developer be obligated for double indemnification, or for the negligence or willful misconduct of an Indemnified Party.

If any suit, action, proceeding (including any governmental or regulatory investigation), claim or demand shall be brought or asserted against any Indemnified Party in respect of which indemnification may be sought pursuant to the above paragraph, such Indemnified Party shall promptly notify the Developer in writing; provided that the failure to notify the Developer shall not relieve it from any liability that it may have hereunder except to the extent that it has been materially prejudiced by such failure; and provided, further, that the failure to notify the Developer shall not relieve it from any liability that it may have to an Indemnified Party otherwise than under the above paragraph unless such liability was also conditioned upon such notice. If any such proceeding shall be brought or asserted against an Indemnified Party and it shall have notified the Developer thereof, the Developer shall retain counsel reasonably satisfactory to the Indemnified Party and approved thereby to represent the Indemnified Party in such proceeding and shall pay the fees and expenses of such counsel related to such proceeding, as incurred. In any such proceeding, any Indemnified Party shall have the right to retain its own counsel, but the fees and expenses of such counsel shall be at the expense of such Indemnified Party unless (i) the Developer and the Indemnified Party shall have mutually agreed to the contrary; (ii) the Developer has failed within a reasonable time to retain counsel reasonably satisfactory to the Indemnified Party; (iii) the Indemnified Party shall have reasonably concluded that there may be legal defenses available to it that are different from or in addition to those available to the Developer such that a material conflict of interest exists for such counsel; or (iv) the named parties in any such proceeding (including any impleaded parties) include the Developer and the Indemnified Party and representation of both parties by the same counsel would be inappropriate due to actual or potential differing interest between them. It is understood and agreed that the Developer shall not, in connection with any proceeding or related

proceedings in the same jurisdiction, be liable for the fees and expenses of more than one separate firm (in addition to any local counsel) for all Indemnified Parties, and that all such fees and expenses, to the extent reasonable, shall be paid or reimbursed as they are incurred. Any such separate firm shall be designated in writing by such Indemnified Parties. The Developer shall not be liable for any settlement of any proceeding effected without its written consent, but if settled with such consent or if there be a final judgment for the plaintiff, the Developer agrees to indemnify each Indemnified Party from and against any loss or liability by reason of such settlement or judgment as set forth above. If the Developer shall, after receiving notice of the indemnification obligation of the Developer and within a period of time necessary to preserve any and all defenses to any claim asserted, fails to assume the defense or to retain counsel for that purpose satisfactory to the Indemnified Party, the Indemnified Party shall have the right, but not the obligation, to undertake the defense of, and to compromise or settle the claim or other matter on behalf of, for the account of and at the risk of, the Developer. The Developer shall not, without the written consent of the Indemnified Party, effect any settlement of any pending or threatened proceeding in respect of which any Indemnified Party is a party and indemnification could have been sought hereunder by such Indemnified Party, unless such settlement (x) includes an unconditional release of such Indemnified Party, in form and substance reasonably satisfactory to such Indemnified Party, from all liability on claims that are the subject matter of such proceeding and (y) does not include any statement as to or any admission of fault, culpability or a failure to act by or on behalf of any Indemnified Party.

20. If between the date hereof and the Closing Date any event relating to or affecting the Developer, its Affiliates, the proposed development of the Property, ownership of the Property, the Developer's development plan, the Developer's financing plan, the Developer's lenders, if any, and contractual arrangements of the Developer or any Affiliates (including, if material to the Developer's development plan or the Developer's financing plan, other loans of such Affiliates) shall occur of which the Developer has actual knowledge which would cause the information under the sections of the Preliminary Official Statement indicated in Paragraph 4 hereof (and subject to the limitations and exclusions contained in Paragraph 4 hereof), to contain an untrue statement of a material fact or to omit to state a material fact necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading, the Developer shall notify the City, the Community Facilities District and the Underwriter and if in the opinion of counsel to the City or the Underwriter such event requires the preparation and publication of a supplement or amendment to the Preliminary Official Statement, the Developer shall reasonably cooperate with the City and the Community Facilities District in the preparation of an amendment or supplement to the Preliminary Official Statement in form and substance satisfactory to counsel to the City, the Community Facilities District and to the Underwriter.

21. The Developer agrees to deliver a Closing Certificate dated the date of issuance of the Bonds at the time of issuance of the Bonds in substantially the form attached as Exhibit C to the Bond Purchase Agreement. If any event related to or affecting the Developer, its Affiliates, or the ownership, development, or sale of the Property occurs, as a result of which it is necessary to modify the Closing Certificate, the Developer agrees to deliver a new Closing Certificate revised to reflect such event.

22. On behalf of the Developer, I have reviewed the contents of this Letter of Representations and have had the opportunity to discuss with counsel to the Developer the

meaning of the contents of this Letter of Representations. The Developer acknowledges and understands that a variety of state and federal securities laws, including, but not limited to the Securities Act of 1933, as amended, and Rule 10b-5 promulgated under the Securities Exchange Act of 1934, as amended, may apply to the Developer and that under some circumstances, certification as to the matters set forth in this Letter of Representations, without additional disclosures or other action, may not fully discharge all duties and obligations of the Developer under such securities laws.

The undersigned has executed this Letter of Representations solely in his or her capacity as an authorized officer or representative of the Developer and he or she will have no personal liability arising from or relating to this Letter of Representations. Any liability arising from or relating to this Letter of Representations may only be asserted against the Developer.

GDC/CDG ESPERANZA PA 4 VENTURE, L.P.,
a Delaware limited partnership

By:_____

Name:_____

Title:_____

[EXECUTION PAGE OF THE LETTER OF REPRESENTATIONS]

EXHIBIT A

To

LETTER OF REPRESENTATIONS
OF GDC/CDG ESPERANZA PA 4 VENTURE, L.P.

DEVELOPER PROVIDED INFORMATION IN APPRAISAL REPORT

See attached.

EXHIBIT C

FORM OF CLOSING CERTIFICATE

$[PAR]
CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 54
(ESPERANZA FACILITIES)
SPECIAL TAX BONDS, SERIES 2022

CLOSING CERTIFICATE OF
GDC/CDG ESPERANZA PA 4 VENTURE, L.P.

[Closing Date]

City of Ontario Community Facilities District
No. 54 (Esperanza Facilities)
303 East B Street
Ontario, California 91764
Attn: City Manager

Stifel, Nicolaus & Company, Incorporated
One Montgomery Street, 35th Floor
San Francisco, California 94104

Ladies and Gentlemen:

Reference is made to the above-captioned bonds (the "**Bonds**") and to the Bond Purchase Agreement, dated [Pricing Date] (the "**Bond Purchase Agreement**"), entered into in connection therewith. This Closing Certificate of GDC/CDG Esperanza PA 4 Venture, L.P. (the "**Closing Certificate**") is delivered pursuant to Section 3(F)(18) of the Bond Purchase Agreement. Capitalized terms used herein and not otherwise defined have the meanings ascribed to them in the Letter of Representations of GDC/CDG Esperanza PA 4 Venture, L.P. (the "**Letter of Representations**"), dated [POS Date], delivered by GDC/CDG Esperanza PA 4 Venture, L.P., a Delaware limited partnership (the "**Developer**").

The undersigned certifies that he or she is familiar with the facts herein certified and is authorized and qualified to certify the same as an authorized officer or representative of the Developer, and the undersigned, on behalf of the Developer, further certifies as follows:

1. The Developer has received the final Official Statement dated [Pricing Date] relating to the Bonds (the "**Official Statement**"). To the Actual Knowledge of the Undersigned, each

statement, representation and warranty made in the Letter of Representations is true and correct in all material respects on and as of the date hereof with the same effect as if made on the date hereof, except that all references therein to the Preliminary Official Statement shall be deemed to be references to the Official Statement.

2. To the Actual Knowledge of the Undersigned, no event has occurred since the date of the Preliminary Official Statement affecting the statements and information described in Paragraph 4 of the Letter of Representations (and subject to the limitations and exclusions contained in Paragraph 4 of the Letter of Representations) relating to the Developer, its Affiliates, the proposed development of the Property, ownership of the Property, the Developer's development plan, the Developer's financing plan, the Developer's lenders, if any, and contractual arrangements of the Developer or any Affiliates (including, if material to the Developer's development plan or the Developer's financing plan, other loans of its Affiliates), which should be disclosed in the Official Statement for the purposes for which it is to be used in order to make such statements and information contained in the Official Statement not misleading in any material respect.

3. For the period through 25 days after the "**End of the Underwriting Period**" as defined in the Bond Purchase Agreement (provided the Developer may assume the End of the Underwriting Period is the Closing Date (as defined in the Bond Purchase Agreement), unless it receives written notice from the Underwriter that the End of the Underwriting Period is later than the Closing Date), if any event relating to or affecting the Developer, its Affiliates, the proposed development of the Property, ownership of the Property, the Developer's development plan, the Developer's financing plan, the Developer's lenders, if any, and contractual arrangements of the Developer or any Affiliates (including, if material to the Developer's development plan or the Developer's financing plan, other loans of its Affiliates) shall occur as a result of which it is necessary, in the opinion of the Underwriter or counsel to the City or the Community Facilities District, to amend or supplement the Official Statement in order to make the information under the sections of the Official Statement indicated in Paragraph 4 of the Letter of Representations (and subject to the limitations and exclusions contained in Paragraph 4 of the Letter of Representations) not misleading in the light of the circumstances under which they were made, the Developer shall reasonably cooperate with the City, the Community Facilities District and the Underwriter in the preparation and publication of a supplement or amendment to the information under the sections of the Official Statement indicated in Paragraph 4 of the Letter of Representations (and subject to the limitations and exclusions contained in Paragraph 4 of the Letter of Representations), in form and substance satisfactory to the Underwriter and counsel to the City and the Community Facilities District which will amend or supplement the Official Statement so that it will not contain an untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading.

4. The Developer has duly authorized the execution and delivery of the Continuing Disclosure Certificate and is duly authorized to perform the obligation on its part to be performed thereunder, and the Continuing Disclosure Certificate constitutes the legal, valid and binding obligation of the Developer, enforceable against it in accordance with its terms, subject to bankruptcy, insolvency, reorganization, arrangement, moratorium, fraudulent conveyance and other similar laws affecting the rights of creditors and certain equitable, legal or statutory principles affecting enforcement of contractual rights generally, regardless of whether such enforcement is considered in a proceeding of law or equity.

5. The undersigned has executed this Closing Certificate solely in his or her capacity as an authorized officer or representative of the Developer and he or she will have no personal liability arising from or relating to this Closing Certificate. Any liability arising from or relating to this Closing Certificate may only be asserted against the Developer.

GDC/CDG ESPERANZA PA 4 VENTURE, L.P.,
a Delaware limited partnership

By:_____

Name:_____

Title:_____

EXHIBIT D

FORM OF ISSUER'S COUNSEL OPINION

[Closing Date]

City of Ontario
Community Facilities District No. 54
(Esperanza Facilities)
Ontario, California

Stifel, Nicolaus & Company, Incorporated
San Francisco, California

Zions Bancorporation, National Association,
as Trustee
Los Angeles, California

ISSUER'S COUNSEL OPINION

Re: $[PAR] City of Ontario Community Facilities District No. 54 (Esperanza Facilities) Special Tax Bonds, Series 2022

Ladies and Gentlemen:

We have acted as issuer's counsel ("Issuer's Counsel") to the City of Ontario (the "City") and the City of Ontario Community Facilities District No. 54 (Esperanza Facilities) (the "Community Facilities District") in connection with the issuance of the above-referenced bonds (the "Bonds"). In such capacity, we have been asked to render this opinion in connection with Section 3(F)(9) of that certain Bond Purchase Agreement, dated [Pricing Date] (the "Bond Purchase Agreement"), by and between Stifel, Nicolaus & Company, Incorporated, as underwriter, and the Community Facilities District, relating to the Bonds. All capitalized terms used herein but not otherwise defined shall have the meanings ascribed to them in the Bond Purchase Agreement.

In rendering this opinion, we have examined and relied upon originals or copies of the following upon which, with your permission, we are relying, without further inquiry or investigation (although we advise you that we have no actual knowledge to the contrary of any matters related thereto): (i) the Community Facilities District Resolution of Issuance, (ii) Resolution No. 2020-034 (the "Resolution of Intention"), (iii) Resolution No. 2020-035 (the "Resolution to Incur Indebtedness"), (iv) Resolution No. 2020-051 ("Resolution Modifying RMA") (v) Resolution No. 2020-052 (the "Resolution of Formation"), (vi) Resolution No. 2020-053 (the "Resolution Deeming it Necessary to Incur Indebtedness"), (vii) Resolution No. 2020-054 (the "Resolution Calling Election"), (viii) Resolution No. 2020-055 (the "Resolution Declaring Results"), (ix) Ordinance No. 3162 (the "Ordinance" and, together with the Resolution of Intention, the Resolution to Incur Indebtedness, the Resolution Modifying RMA, the Resolution of Formation, the Resolution Deeming it Necessary to Incur Indebtedness, the Resolution Calling Election and the Resolution Declaring Results, the "Formation Resolutions and Ordinance"), (x) the Community Facilities District Documents, and (xi) the Official Statement, relating to the Bonds, and we have made such other investigations of law and facts as we have deemed necessary to render the following opinions.

The opinions expressed herein are based on an analysis of existing statutes, regulations, rulings and court decisions and cover certain matters not directly addressed by such authorities. Such opinions may be affected by actions taken or omitted or events occurring after the date hereof. We have not undertaken to determine, or to inform any person, whether any such actions or events are taken or do occur.

In our examination, we have assumed, without independent investigation, the authenticity of all documents submitted to us as originals, of all documents submitted to us as certified or photostatic copies and the authenticity of the originals of such latter documents and the accuracy of the statements and representations contained in such documents. In addition, we have assumed the authority of and due execution by each of the parties to the documents other than the City and the Community Facilities District.

As used in this opinion, the phrase "current actual knowledge" means knowledge as we have obtained from (i) the incumbency and signature certificate of the Community Facilities District, (ii) the representations and warranties contained in each closing certificate of the Community Facilities District, and (iii) knowledge of facts or other information currently known to lawyers in our firm who have performed legal services for the City or the Community Facilities District.

Based on the foregoing, we hereby advise you that, as of the date hereof, we are of the opinion that:

(i) the City is a municipal corporation and general law city, duly organized and existing under the Constitution and the laws of the State of California;

(ii) the Community Facilities District is duly organized and validly existing as a community facilities district under and by virtue of the Constitution and laws of the State of California (including the Community Facilities District Act);

(iii) the Community Facilities District Resolution of Issuance and the Formation Resolutions and Ordinance have been duly adopted at meetings of the City Council of the City, which were called and held pursuant to law and with all public notice required by law and at which a quorum was present and acting throughout, and the Community Facilities District Resolution of Issuance and the Formation Resolutions and Ordinance are in full force and effect and have not been modified, amended, rescinded or repealed since the respective dates of their adoption;

(iv) the Community Facilities District Documents and the Official Statement have been duly authorized, executed and delivered by the Community Facilities District and constitute the legal, valid and binding obligations of the Community Facilities District enforceable against the Community Facilities District in accordance with their terms, subject to bankruptcy, insolvency, reorganization, moratorium and other similar laws affecting creditors' rights, to the application of equitable principles where equitable remedies are sought and to the exercise of judicial discretion in appropriate cases or seeks to restrain or to enjoin the development of property within the Community Facilities District;

(v) except as may be stated in the Official Statement, to our current actual knowledge, there is no action, suit, proceeding or investigation before or by any court, public board or body pending (notice of which has been served on the City or the Community Facilities District) or threatened wherein an unfavorable decision, ruling or finding would: (a) affect the creation,

organization, existence or powers of the City or the Community Facilities District, or the titles of their members and officers to their respective offices; or (b) affect the validity of the Community Facilities District Documents or restrain or enjoin the repayment of the Bonds or in any way contest or affect the validity of the Community Facilities District Documents or contest the authority of the Community Facilities District to enter into or perform its obligations under any of the Community Facilities District Documents or under which a determination adverse to the City or Community Facilities District would have a material adverse effect upon the financial condition or the revenues of the City or Community Facilities District, questions the right of the Community Facilities District to use Special Taxes levied within the Community Facilities District for the repayment of the Bonds or affects in any manner the right or ability of the Community Facilities District to collect or pledge the Special Taxes levied within the Community Facilities District for the repayment of the Bonds;

(vi) to our current actual knowledge, the execution and delivery of the Bonds and the Community Facilities District Documents, and compliance with the provisions of each, will not conflict with or constitute a breach of or default under any loan agreement, note, ordinance, resolution, indenture, contract, agreement or other instrument of which the Community Facilities District is a party or is otherwise subject or bound, a consequence of which could be to materially and adversely affect the ability of the Community Facilities District to perform its obligations under the Bonds or the Community Facilities District Documents; and

(vii) all approvals, consents, authorization, elections and orders of or filings or registrations with any governmental authority, board, agency or commission having jurisdiction which would constitute a condition precedent to, or the absence of which would materially adversely affect, the ability of the Community Facilities District, to perform its obligations under the Bonds or the Community Facilities District Documents, have been obtained or made, as the case may be, and are in full force and effect.

Our opinion is further qualified by the following:

(a) We express no opinion with respect to the laws of any state or jurisdiction other than California and the United States regarding the enforceability of any transaction mentioned herein or the interpretation, authorization, execution, validity, enforceability or effect of any of the documents mentioned herein; provided further that we express no opinion with respect to California or federal tax and securities law.

(b) As Issuer's Counsel in this matter, we have not rendered financial advice to the City or to the Community Facilities District and do not represent by this opinion, or otherwise, that we reviewed or made any assessment about, nor do we express any opinion about, the ability of the Community Facilities District to pay debt service or amounts due under the Indenture, and accordingly, we offer no opinion whatsoever regarding such financial feasibility or ability to repay the Bonds.

(c) We express no opinion with respect to any indemnification, contribution, lien priority or choice of law provisions contained in the foregoing documents.

This letter is furnished by us as Issuer's Counsel. Other than the City and the Community Facilities District, no attorney-client relationship has existed or exists between our firm and you in connection with the Bonds or by virtue of this letter. Our engagement with respect to the Bonds has terminated as of the date hereof, and we disclaim any obligation to update this letter. This letter is

delivered to you, is solely for your benefit and is not to be used, circulated, quoted or otherwise referred to or relied upon for any other purpose or by any other person; provided, however, a copy may be included in the transcript of the proceedings for the Bonds. This letter is not intended to, and may not, be relied upon by owners of the Bonds.

We bring to your attention the fact that our conclusions are an expression of professional judgment and are not a guarantee of a result.

Best Best & Krieger LLP
City Attorney

EXHIBIT E

$[PAR]
CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 54
(ESPERANZA FACILITIES)
SPECIAL TAX BONDS, SERIES 2022

FORM OF ISSUE PRICE CERTIFICATE

The undersigned, Stifel, Nicolaus & Company, Incorporated ("Stifel"), hereby certifies as set forth below with respect to the sale and issuance of the above-captioned obligations (the "Bonds").

1. ***Bond Purchase Agreement.*** On [Pricing Date] (the "Sale Date"), Stifel and the Issuer executed a Bond Purchase Agreement (the "Purchase Agreement") in connection with the sale of the Bonds. Stifel has not modified the Purchase Agreement since its execution on the Sale Date.

2. ***Price.***

   (a) As of the date of this Certificate, for each [Maturity] [[of the General Rule Maturities] of the Bonds, the first price at which at least 10% of each such Maturity of the Bonds was sold to the Public (the "10% Test") was the respective price for such Maturity listed in **Schedule A** attached hereto.

   (b) [Stifel offered the Hold-the-Offering-Price Maturities to the Public for purchase at the respective initial offering prices listed in **Schedule A** (the "Initial Offering Prices") on or before the Sale Date. A copy of the pricing wire or equivalent communication for the Bonds is attached to this certificate as **Schedule B**.

   (c) As set forth in the Bond Purchase Agreement, Stifel has agreed in writing that, (i) for each Maturity of the Hold-the-Offering-Price Maturities, it would neither offer nor sell any of the Bonds of such Maturity to any person at a price that is higher than the Initial Offering Price for such Maturity during the Holding Period for such Maturity (the "hold-the-offering-price rule"), and (ii) any selling group agreement shall contain the agreement of each dealer who is a member of the selling group, and any retail distribution agreement shall contain the agreement of each broker-dealer who is a party to the retail distribution agreement, to comply with the hold-the-offering-price rule. Pursuant to such agreement, no Underwriter (as defined below) has offered or sold any Maturity of the Hold-the-Offering-Price Maturities at a price that is higher than the respective Initial Offering Price for that Maturity of the Bonds during the Holding Period.]

   (d) [** With respect to each of the General Rule Maturities of the Bonds:

      (1) As of the date of this Certificate, Stifel has not sold at least 10% of the Bonds of these Maturities at any single price.

      (2) As of the date of this Certificate, Stifel reasonably expects that the first sale to the Public of Bonds of these Maturities will be at or below the respective price or prices

listed on the attached **Schedule A** as the "Reasonably Expected Sale Prices for Undersold Maturities."

(3) Stifel will provide actual sales information (substantially similar to the information contained on **Schedule B**) as to the price at which the first 10% of each such Maturity (i.e., the Undersold Maturity or Maturities) is sold to the Public.

(4) On the date the 10% Test is satisfied with respect to all Maturities of the Bonds, Stifel will execute a supplemental certificate substantially in the form attached hereto as **Schedule C** with respect to any remaining Maturities for which the 10% Test has not been satisfied as of the Closing Date.**]

2. ***Defined Terms.***

(a) *"General Rule Maturities"* means those Maturities of the Bonds listed in Schedule A hereto as the "General Rule Maturities."

(b) *"Hold-the-Offering-Price Maturities"* means those Maturities of the Bonds listed in Schedule A hereto as the "Hold-the-Offering-Price Maturities."

(c) *"Holding Period"* means, with respect to a Hold-the-Offering-Price Maturity, the period starting on the Sale Date and ending on the earlier of (i) the close of the fifth business day after the Sale Date, or (ii) the date on which Stifel has sold at least 10% of such Hold-the-Offering-Price Maturity to the Public at prices that are no higher than the Initial Offering Price for such Hold-the-Offering-Price Maturity.

(d) *"Issuer"* means the City of Ontario Community Facilities District No. 54 (Esperanza Facilities).

(e) *"Maturity"* means Bonds with the same credit and payment terms. Bonds with different maturity dates, or Bonds with the same maturity date but different stated interest rates, are treated as separate Maturities.

(f) *"Public"* means any person (including an individual, trust, estate, partnership, association, company, or corporation) other than an Underwriter or a related party to an Underwriter. The term "related party" for purposes of this certificate generally means any two or more persons who have greater than 50 percent common ownership, directly or indirectly.

(g) *"Underwriter"* means (i) any person that agrees pursuant to a written contract with the Issuer (or with the lead Underwriter to form an underwriting syndicate) to participate in the initial sale of the Bonds to the Public, and (ii) any person that agrees pursuant to a written contract directly or indirectly with a person described in clause (i) of this paragraph to participate in the initial sale of the Bonds to the Public (including a member of a selling group or a party to a retail distribution agreement participating in the initial sale of the Bonds to the Public).

3. ***Reserve* Fund.** The funding of the Reserve Fund under the Indenture, and as provided in the Tax Certificate, is reasonably required, was a vital factor in marketing the Bonds, facilitated the marketing of the Bonds at an interest rate comparable to that of bonds and other tax-exempt obligations of a similar type, and is not in excess of the amount necessary for such purpose.

4. The representations set forth in this certificate are limited to factual matters only. Nothing in this certificate represents Stifel's interpretation of any laws, including specifically Sections 103 and 148 of the Internal Revenue Code of 1986, as amended, and the Treasury Regulations thereunder. The undersigned understands that the foregoing information will be relied upon by the Issuer with respect to certain of the representations set forth in the Tax Certificate of the Issuer dated [Closing Date] and with respect to compliance with the federal income tax rules affecting the Bonds, and by Bond Counsel, in connection with rendering its opinion that the interest on the Bonds is excluded from gross income for federal income tax purposes, the preparation of the Internal Revenue Service Form 8038-G, and other federal income tax advice that it may give to the Issuer from time to time relating to the Bonds.

STIFEL, NICOLAUS & COMPANY, INCORPORATED

By:_____
Managing Director

By:_____
Director

Dated: [Closing Date]

SCHEDULE A
TO
ISSUE PRICE CERTIFICATE

[Schedules to be updated at pricing in the event there are Hold-the-Offering-Price-Maturities]

Actual Sales Information as of Closing Date

Maturity/CUSIP	Coupon	Date Sold	Time Sold	Par Amount	Sale Price

[Reasonably Expected Sales Prices for Undersold Maturities as of Closing Date**

Maturity/CUSIP	Coupon	Par Amount	Offering Prices

****]**

[**SCHEDULE B
TO
ISSUE PRICE CERTIFICATE

Actual Sales for Undersold Maturities as of the Closing Date

Maturity/CUSIP	Date Sold	Time Sold	Par Amount	Sale Price

**]

[**SCHEDULE C
TO
ISSUE PRICE CERTIFICATE

SUPPLEMENTAL ISSUE PRICE CERTIFICATE OF UNDERWRITER

**$[PAR]
CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 54
(ESPERANZA FACILITIES)
SPECIAL TAX BONDS, SERIES 2022**

The undersigned, Stifel, Nicolaus & Company, Incorporated ("Stifel"), hereby certifies as set forth below with respect to the sale and issuance of the above-captioned obligations (the "Bonds").

1. ***Issue Price*.**

(a) Stifel sold at least 10% of the _____ Maturities of the Bonds to the Public at the price or prices shown on the Issue Price Certificate dated as of the Closing Date (the "10% Test"). With respect to each of the _____ Maturities of the Bonds, Stifel had not satisfied the 10% Test as of the Closing Date (the "Undersold Maturities").

(b) As of the date of this Supplemental Certificate, Stifel has satisfied the 10% Test with respect to the Undersold Maturities. The first price or prices at which at least 10% of each such Undersold Maturity was sold to the Public are the respective prices listed on **Exhibit A** attached hereto.

2. ***Defined Terms.***

(a) *"Issuer"* means the City of Ontario Community Facilities District No. 54 (Esperanza Facilities).

(b) *"Maturity"* means Bonds with the same credit and payment terms. Bonds with different maturity dates, or Bonds with the same maturity date but different stated interest rates, are treated as separate Maturities.

(c) *"Public"* means any person (including an individual, trust, estate, partnership, association, company, or corporation) other than an Underwriter or a related party to an Underwriter. The term "related party" for purposes of this certificate generally means any two or more persons who have greater than 50 percent common ownership, directly or indirectly.

(d) *"Underwriter"* means (1) any person that agrees pursuant to a written contract with the Issuer (or with the lead Underwriter to form an underwriting syndicate) to participate in the initial sale of the Bonds to the Public, and (2) any person that agrees pursuant to a written contract directly or indirectly with a person described in clause (1) of this paragraph to participate in the initial sale of the Bonds to the Public (including a member of a selling group or a party to a retail distribution agreement participating in the initial sale of the Bonds to the Public).

3. The representations set forth in this certificate are limited to factual matters only. Nothing in this certificate represents Stifel's interpretation of any laws, including specifically Sections 103 and 148 of the Internal Revenue Code of 1986, as amended, and the Treasury Regulations thereunder. The undersigned understands that the foregoing information will be relied upon by the Issuer with respect to certain of the representations set forth in the Tax Certificate of the Issuer dated [Closing Date] and with respect to compliance with the federal income tax rules affecting the Bonds, and by Bond Counsel, in connection with rendering its opinion that the interest on the Bonds is excluded from gross income for federal income tax purposes, the preparation of the Internal Revenue Service Form 8038-G, and other federal income tax advice that it may give to the Issuer from time to time relating to the Bonds.

STIFEL, NICOLAUS & COMPANY, INCORPORATED

By:_____
[Title]

By:_____
[Title]

Dated:

EXHIBIT A
TO
SUPPLEMENTAL ISSUE PRICE CERTIFICATE**]

CONTINUING DISCLOSURE AGREEMENT

by and between

CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 54
(ESPERANZA FACILITIES)

and

ZIONS BANCORPORATION, NATIONAL ASSOCIATION,
AS TRUSTEE

Dated as of _____ 1, 2022

City of Ontario
Community Facilities District No. 54
(Esperanza Facilities)
Special Tax Bonds, Series 2022

CONTINUING DISCLOSURE AGREEMENT

THIS CONTINUING DISCLOSURE AGREEMENT (this "Disclosure Agreement"), dated as of _____ 1, 2022, is by and between CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 54 (Esperanza FACILITIES), a community facilities district organized and existing under the laws of the State of California (the "Community Facilities District"), and ZIONS BANCORPORATION, NATIONAL ASSOCIATION, a national banking association organized and existing under the laws of the United States of America, as Trustee (the "Trustee").

W I T N E S S E T H :

WHEREAS, the Community Facilities District has issued its City of Ontario Community Facilities District No. 54 (Esperanza Facilities) Special Tax Bonds, Series 2022 (the "Series 2022 Bonds"), in the aggregate principal amount of $_____, pursuant to the Indenture, dated as of _____ 1, 2022 (the "Indenture"), by and between the Community Facilities District and the Trustee; and

WHEREAS, this Disclosure Agreement is being executed and delivered by the Community Facilities District and the Trustee for the benefit of the owners and beneficial owners of the Series 2022 Bonds and in order to assist the underwriters of the Series 2022 Bonds in complying with Securities and Exchange Commission Rule 15c2-12(b)(5);

NOW, THEREFORE, for and in consideration of the mutual promises and covenants herein contained, the receipt whereof is hereby acknowledged, the parties hereto agree as follows:

Section 1. Definitions. Unless the context otherwise requires, the terms defined in this Section shall for all purposes of this Disclosure Agreement have the meanings herein specified. Capitalized undefined terms used herein shall have the meanings ascribed thereto in the Indenture.

"Annual Report" means any Annual Report provided by the Community Facilities District pursuant to, and as described in, Sections 2 and 3 hereof.

"Annual Report Date" means the date in each year that is the first day of the month following the ninth month after the end of the Community Facilities District's fiscal year, which date, as of the date of this Disclosure Agreement, is April 1.

"Community Facilities District" means City of Ontario Community Facilities District No. 54 (Esperanza Facilities), a community facilities district organized and existing under the laws of the State, and its successors.

"Disclosure Representative" means the Deputy City Treasurer of the City, or his or her designee, or such other person as the Community Facilities District shall designate in writing to the Trustee from time to time.

"Dissemination Agent" means the Trustee, acting in its capacity as Dissemination Agent hereunder, or any successor Dissemination Agent designated in writing by the Community Facilities District and which has filed with the Trustee a written acceptance of such designation.

"Financial Obligation" means (a) a debt obligation of the Community Facilities District, (b) a derivative instrument entered into in connection with, or pledged as security or a source of payment for, an existing or planned debt obligation of the Community Facilities District, or (c) a guarantee of (i) a debt obligation of the Community Facilities District, or (ii) a derivative instrument described in clause (b), above; provided, however, that the term "Financial Obligation" shall not include "municipal securities" (as such term is defined in the Securities Exchange Act of 1934, as amended) as to which a "final official statement" (as such term is defined in the Rule) has been provided to the MSRB consistent with the Rule.

"Indenture" means the Indenture, dated as of _____ 1, 2022, by and between the Community Facilities District and Zions Bancorporation, National Association, as Trustee, as originally executed and as it may be modified or amended from time to time in accordance with its terms.

"Listed Events" means any of the events listed in subsection (a) or subsection (b) of Section 4 hereof.

"MSRB" means the Municipal Securities Rulemaking Board or any other entity designated or authorized by the Securities and Exchange Commission to receive reports pursuant to the Rule. Until otherwise designated by the MSRB or the Securities and Exchange Commission, filings with the MSRB are to be made through the Electronic Municipal Market Access (EMMA) website of the MSRB, currently located at http://emma.msrb.org.

"Participating Underwriter" means any of the original underwriters of the Series 2022 Bonds required to comply with the Rule in connection with the offering of the Series 2022 Bonds.

"Rule" means Rule 15c2-12(b)(5) adopted by the Securities and Exchange Commission under the Securities Exchange Act of 1934, as the same may be amended from time to time.

"Trustee" means Zions Bancorporation, National Association, as Trustee under the Indenture, or any successor thereto as Trustee thereunder substituted in its place as provided therein.

Section 2. Provision of Annual Reports. (a) The Community Facilities District shall, or shall cause the Dissemination Agent to, provide to the MSRB an Annual Report that is consistent with the requirements of Section 3 hereof, not later than the Annual Report Date, commencing with the report for the 2021-22 Fiscal Year. The Annual Report may include by reference other information as provided in Section 3 hereof; provided, however, that the audited financial statements of the Community Facilities District, if any, may be submitted separately from the balance of the Annual Report, and later than the date required above for the filing of the Annual Report if they are not available by that date. If the Community Facilities District's fiscal year changes, it shall, or it shall instruct the Dissemination Agent to, give notice of such change in a filing with the MSRB.

(b) Not later than 15 business days prior to the date specified in subsection (a) of this Section for the providing of the Annual Report to the MSRB, the Community Facilities District shall provide the Annual Report to the Dissemination Agent and the Trustee (if the Trustee is not the Dissemination Agent). If by such date, the Trustee has not received a copy of the Annual Report, the Trustee shall contact the Community Facilities District and the Dissemination Agent to determine if the Community Facilities District is in compliance with the first sentence of this subsection (b).

(c) If the Trustee is unable to verify that an Annual Report has been provided to the MSRB by the date required in subsection (a) of this Section, the Trustee shall, in a timely manner, send a notice to the MSRB in substantially the form attached as Exhibit A.

(d) The Dissemination Agent shall:

(i) provide each Annual Report received by it to the MSRB, as provided herein; and

(ii) file a report with the Community Facilities District and (if the Dissemination Agent is not the Trustee) the Trustee certifying that such Annual Report has been provided pursuant to this Disclosure Agreement and stating the date it was provided to the MSRB.

Section 3. Content of Annual Reports. The Community Facilities District's Annual Report shall contain or incorporate by reference the following:

(a) The Community Facilities District's audited financial statements, if any, prepared in accordance with generally accepted accounting principles as promulgated to apply to governmental entities from time to time by the Governmental Accounting Standards Board. If the Community Facilities District's audited financial statements, if any, are not available by the time the Annual Report is required to be filed pursuant to subsection (a) of Section 2 hereof, the Annual Report shall contain unaudited financial statements, in a format similar to that used for the Community Facilities District's audited financial statements, and the audited financial statements, if any, shall be filed in the same manner as the Annual Report when they become available.

(b) The following information:

(i) The principal amount of Series 2022 Bonds Outstanding as of the December 31 next preceding the Annual Report Date;

(ii) The principal amount of Additional Bonds, if any, Outstanding as of the December 31 next preceding the Annual Report Date;

(iii) The balance in (A) the GDC/CDG Esperanza Acquisition Account, and (B) the NMC Acquisition Account, as of the December 31 next preceding the Annual Report Date;

(iv) The balance in the Reserve Fund, and a statement of the Reserve Requirement, as of the December 31 next preceding the Annual Report Date;

(v) The total assessed value of all parcels within the Community Facilities District on which the Special Taxes are levied, as shown on the assessment roll of the San Bernardino County Assessor last equalized prior to the December 31 next preceding the Annual Report Date, and a statement of assessed value-to-Bonded debt ratios therefor, either by individual parcel or by categories (e.g., "below 3:1," "3:1 to 4:1," etc.);

(vi) The Special Tax delinquency rate for all parcels within the Community Facilities District, as shown on the assessment roll of the San Bernardino County Assessor last equalized prior to the December 31 next preceding the Annual Report Date, the number of parcels within the Community Facilities District delinquent in payment of Special Taxes as of the December 31 next preceding the Annual Report Date, the amount of each delinquency, the length of time delinquent and the date on which foreclosure was commenced, or similar information pertaining to delinquencies deemed appropriate by the Community Facilities District; provided, however, that parcels with aggregate delinquencies of $2,000 or less (excluding penalties and interest) may be grouped together and such information may be provided by category;

(vii) The status of foreclosure proceedings and a summary of the results of any foreclosure sales as of the December 31 next preceding the Annual Report Date;

(viii) The identity of any property owner representing more than 5% of the Special Tax levy delinquent in payment of Special Taxes as of the December 31 next preceding the Annual Report Date;

(ix) A land ownership summary listing property owners responsible for more than 5% of the annual Special Tax, as shown on the assessment roll of the San Bernardino County Assessor last equalized prior to the December 31 next preceding the Annual Report Date; and

(x) A description of any changes to the Rate and Method approved by, or submitted for approval to, the qualified electors of the Community Facilities District during the period from the date of filing the prior year's Annual Report to the date of filing such Annual Report.

Any or all of the items listed above may be included by specific reference to other documents, including official statements of debt issues of the Community Facilities District or related public entities that have been made available to the public on the MSRB's website. The Community Facilities District shall clearly identify each such other document so included by reference.

Section 4. Reporting of Significant Events. (a) Pursuant to the provisions of this Section, the Community Facilities District shall give, or cause to be given, notice of the

occurrence of any of the following events with respect to the Series 2022 Bonds in a timely manner not later than ten business days after the occurrence of the event:

(i) Principal and interest payment delinquencies.

(ii) Unscheduled draws on debt service reserves reflecting financial difficulties.

(iii) Unscheduled draws on credit enhancements reflecting financial difficulties.

(iv) Substitution of credit or liquidity providers, or their failure to perform.

(v) Adverse tax opinions or issuance by the Internal Revenue Service of proposed or final determination of taxability or of a Notice of Proposed Issue (IRS Form 5701 TEB).

(vi) Tender offers.

(vii) Defeasances.

(viii) Rating changes.

(ix) Bankruptcy, insolvency, receivership or similar event of the Community Facilities District.

(x) Default, event of acceleration, termination event, modification of terms or other similar events under the terms of a Financial Obligation, any of which reflect financial difficulties.

For purposes of the event identified in paragraph (ix) of this subsection, the event is considered to occur when any of the following occur: the appointment of a receiver, fiscal agent or similar officer for the Community Facilities District in a proceeding under the U.S. Bankruptcy Code or in any other proceeding under state or federal law in which a court or governmental authority has assumed jurisdiction over substantially all of the assets or business of the Community Facilities District, or if such jurisdiction has been assumed by leaving the existing governmental body and officials or officers in possession but subject to the supervision and orders of a court or governmental authority, or the entry of an order confirming a plan of reorganization, arrangement or liquidation by a court or governmental authority having supervision or jurisdiction over substantially all of the assets or business of the Community Facilities District.

(b) Pursuant to the provisions of this Section, the Community Facilities District shall give, or cause to be given, notice of the occurrence of any of the following events with respect to the Series 2022 Bonds, if material, in a timely manner not later than ten business days after the occurrence of the event:

(i) Unless described in paragraph (v) of subsection (a) of this Section, material notices or determinations by the Internal Revenue Service with respect to the tax status of the Series 2022 Bonds or other material events affecting the tax status of the Series 2022 Bonds.

(ii) Modifications to rights of holders of the Series 2022 Bonds.

(iii) Series 2022 Bond calls.

(iv) Release, substitution, or sale of property securing repayment of the Series 2022 Bonds.

(v) Non-payment related defaults.

(vi) The consummation of a merger, consolidation, or acquisition involving the Community Facilities District or the sale of all or substantially all of the assets of the Community Facilities District other than in the ordinary course of business, the entry into a definitive agreement to undertake such an action or the termination of a definitive agreement relating to any such actions, other than pursuant to its terms.

(vii) Appointment of a successor or additional Trustee or the change of name of a Trustee.

(viii) Incurrence of a Financial Obligation, or agreement to covenants, events of default, remedies, priority rights or other similar terms of a Financial Obligation, any of which affect holders of the Series 2022 Bonds.

(c) The Trustee shall, within one business day of obtaining actual knowledge of the occurrence of any of the Listed Events, contact the Disclosure Representative and inform such person of the event. The Trustee shall have no responsibility for determining the materiality of any such event, or whether any such event reflects financial difficulties.

(d) Whenever the Community Facilities District obtains knowledge of the occurrence of a Listed Event described in subsection (b) of this Section, the Community Facilities District shall determine if such event would be material under applicable Federal securities law.

(e) Whenever the Community Facilities District obtains knowledge of the occurrence of a Listed Event described in subsection (a) of this Section, or determines that knowledge of a Listed Event described in subsection (b) of this Section would be material under applicable Federal securities law, the Community Facilities District shall, or shall cause the Dissemination Agent to, file a notice of the occurrence of such Listed Event with the MSRB, within ten business days of such occurrence.

(f) Notwithstanding the foregoing, notice of Listed Events described in paragraph (iii) of subsection (b) of this Section need not be given any earlier than the notice (if any) of the underlying event is given to holders of affected Series 2022 Bonds pursuant to the Indenture.

Section 5. Format for Filings with MSRB. Any report or filing with the MSRB pursuant to this Disclosure Agreement must be submitted in electronic format, accompanied by such identifying information as is prescribed by the MSRB.

Section 6. Termination of Reporting Obligation. The Community Facilities District's obligations under this Disclosure Agreement shall terminate upon the legal defeasance, prior redemption or payment in full of all of the Series 2022 Bonds. If such termination occurs prior to the final maturity of the Series 2022 Bonds, the Community Facilities District shall give, or cause to be given, notice of such termination in a filing with the MSRB.

Section 7. Dissemination Agent. The Community Facilities District may, from time to time, appoint or engage a Dissemination Agent to assist it in carrying out its obligations under this Disclosure Agreement, and may discharge any such Dissemination Agent, with or without appointing a successor Dissemination Agent. The Dissemination Agent may resign by providing 30 days' written notice to the Community Facilities District. If at any time there is not any other designated Dissemination Agent, the Trustee shall be the Dissemination Agent.

Section 8. Amendment; Waiver. Notwithstanding any other provision of this Disclosure Agreement, the Community Facilities District and the Trustee may amend this Disclosure Agreement (and the Trustee shall agree to any amendment so requested by the Community Facilities District, so long as such amendment does not adversely affect the rights or materially increase the obligations of the Trustee), and any provision of this Disclosure Agreement may be waived, provided that the following conditions are satisfied:

(a) if the amendment or waiver relates to the provisions of subsection (a) of Section 2 hereof, Section 3 hereof or subsection (a) or (b) of Section 4 hereof, it may only be made in connection with a change in circumstances that arises from a change in legal requirements, change in law, or change in the identity, nature or status of an obligated person with respect to the Series 2022 Bonds, or the type of business conducted;

(b) the undertakings herein, as proposed to be amended or waived, would, in the opinion of nationally recognized bond counsel, have complied with the requirements of the Rule at the time of the primary offering of the Series 2022 Bonds, after taking into account any amendments or interpretations of the Rule, as well as any change in circumstances; and

(c) the proposed amendment or waiver (i) is approved by Owners of the Series 2022 Bonds in the manner provided in the Indenture for amendments to the Indenture with the consent of Owners, or (ii) does not, in the opinion of nationally recognized bond counsel, materially impair the interests of Owners or Beneficial Owners of the Series 2022 Bonds.

In the event of any amendment or waiver of a provision of this Disclosure Agreement, the Community Facilities District shall describe such amendment or waiver in the next Annual Report, and shall include, as applicable, a narrative explanation of the reason for the amendment or waiver and its impact on the type (or in the case of a change of accounting principles, on the presentation) of financial information or operating data being presented by the Community

Facilities District. In addition, if the amendment relates to the accounting principles to be followed in preparing financial statements (i) notice of such change shall be given in a filing with the MSRB, and (ii) the Annual Report for the year in which the change is made shall present a comparison (in narrative form and also, if feasible, in quantitative form) between the financial statements as prepared on the basis of the new accounting principles and those prepared on the basis of the former accounting principles.

Section 9. Additional Information. Nothing in this Disclosure Agreement shall be deemed to prevent the Community Facilities District from disseminating any other information, using the means of dissemination set forth in this Disclosure Agreement or any other means of communication, or including any other information in any Annual Report or notice required to be filed pursuant to this Disclosure Agreement, in addition to that which is required by this Disclosure Agreement. If the Community Facilities District chooses to include any information in any Annual Report or notice in addition to that which is specifically required by this Disclosure Agreement, the Community Facilities District shall have no obligation under this Disclosure Agreement to update such information or include it in any future Annual Report or notice of occurrence of a Listed Event or any other event required to be reported.

Section 10. Default. In the event of a failure of the Community Facilities District, the Trustee or the Dissemination Agent to comply with any provision of this Disclosure Agreement, the Trustee may (and, at the written direction of any Participating Underwriter or the Owners of at least 25% of the aggregate principal amount of Outstanding Series 2022 Bonds, shall, upon receipt of indemnification reasonably satisfactory to the Trustee), or any Owner or Beneficial Owner of the Series 2022 Bonds may, take such actions as may be necessary and appropriate, including seeking mandate or specific performance by court order, to cause the Community Facilities District, the Trustee or the Dissemination Agent, as the case may be, to comply with its obligations under this Disclosure Agreement. A default under this Disclosure Agreement shall not be deemed an Event of Default under the Indenture, and the sole remedy under this Disclosure Agreement in the event of any failure of the Community Facilities District, the Trustee or the Dissemination Agent to comply with this Disclosure Agreement shall be an action to compel performance.

Section 11. Duties, Immunities and Liabilities of Trustee and Dissemination Agent. Article VIII of the Indenture is hereby made applicable to this Disclosure Agreement as if this Disclosure Agreement were (solely for this purpose) contained in the Indenture. The Dissemination Agent shall be entitled to the protections and limitations from liability afforded to the Trustee thereunder. Neither the Trustee nor the Dissemination Agent shall be responsible for the form or content of any Annual Report or notice of Listed Event. The Dissemination Agent shall receive reasonable compensation for its services provided under this Disclosure Agreement and shall be reimbursed for its reasonable expenses (including attorneys' fees and expenses) incurred by it in the exercise or performance of its powers and duties hereunder. The Dissemination Agent (if other than the Trustee or the Trustee in its capacity as Dissemination Agent) shall have only such duties as are specifically set forth in this Disclosure Agreement. To the extent permitted by law, the Community Facilities District agrees to indemnify and save the Dissemination Agent, its officers, directors, employees and agents, harmless against any loss, expense and liabilities incurred by it in the exercise or performance of its powers and duties hereunder, including the costs and expenses (including attorneys' fees and expenses) of

defending against any claim of liability, and which are not due to its negligence or its willful misconduct. The obligations of the Community Facilities District under this Section shall survive resignation or removal of the Dissemination Agent and the termination of this Disclosure Agreement.

Section 12. Beneficiaries. This Disclosure Agreement shall inure solely to the benefit of the Community Facilities District, the Trustee, the Dissemination Agent, the Participating Underwriter and the Owners and Beneficial Owners from time to time of the Series 2022 Bonds, and shall create no rights in any other person or entity.

Section 13. Governing Laws. This Disclosure Agreement shall be governed by and construed in accordance with the laws of the State of California.

Section 14. Electronic Signature. Each of the parties hereto agrees that the transaction consisting of this Disclosure Agreement may be conducted by electronic means. Each party agrees, and acknowledges that it is such party's intent, that if such party signs this Disclosure Agreement using an electronic signature, it is signing, adopting and accepting this Disclosure Agreement and that signing this Disclosure Agreement using an electronic signature is the legal equivalent of having placed its handwritten signature on this Disclosure Agreement on paper. Each party acknowledges that it is being provided with an electronic or paper copy of this Disclosure Agreement in a usable format.

Section 15. Counterparts. This Disclosure Agreement may be executed in several counterparts, each of which shall be an original and all of which shall constitute but one and the same instrument.

IN WITNESS WHEREOF, the parties hereto have executed this Disclosure Agreement as of the date first above written.

CITY OF ONTARIO COMMUNITY FACILITIES DISTRICT NO. 54 (ESPERANZA FACILITIES)

By: _____

ZIONS BANCORPORATION, NATIONAL ASSOCIATION, AS TRUSTEE

By: _____

EXHIBIT A

NOTICE OF FAILURE TO FILE ANNUAL REPORT

Name of Issuer: City of Ontario Community Facilities District No. 54 (Esperanza Facilities)

Name of Issue: City of Ontario Community Facilities District No. 54 (Esperanza Facilities) Special Tax Bonds, Series 2022

Date of Issuance: _____, 2022

NOTICE IS HEREBY GIVEN that City of Ontario Community Facilities District No. 54 (Esperanza Facilities) (the "Community Facilities District") has not provided an Annual Report with respect to the above-named Bonds as required by the Continuing Disclosure Agreement, dated as of _____ 1, 2022, by and between the Community Facilities District and Zions Bancorporation, National Association, as Trustee. [The Community Facilities District anticipates that such Annual Report will be filed by _____.]

Dated: _____

Zions Bancorporation, National Association, as Trustee, on behalf of City of Ontario Community Facilities District No. 54 (Esperanza Facilities)

cc: City of Ontario
Community Facilities District
No. 54 (Esperanza Facilities)

PRELIMINARY OFFICIAL STATEMENT DATED APRIL __, 2022

NEW ISSUE — BOOK-ENTRY-ONLY **NO RATING**

In the opinion of Orrick, Herrington & Sutcliffe LLP, Bond Counsel to the District, based upon an analysis of existing laws, regulations, rulings and court decisions, and assuming, among other matters, the accuracy of certain representations and compliance with certain covenants, interest on the Series 2022 Bonds is excluded from gross income for federal income tax purposes under Section 103 of the Internal Revenue Code of 1986 and is exempt from State of California personal income taxes. In the further opinion of Bond Counsel, interest on the Series 2022 Bonds is not a specific preference item for purposes of the federal alternative minimum tax. Bond Counsel expresses no opinion regarding any other tax consequences related to the ownership or disposition of, or the amount, accrual or receipt of interest on, the Series 2022 Bonds. See "TAX MATTERS" herein.

$6,110,000*
CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 54
(ESPERANZA FACILITIES)
SPECIAL TAX BONDS, SERIES 2022

Dated: Date of Delivery **Due: September 1, as shown on the inside cover page**

The City of Ontario Community Facilities District No. 54 (Esperanza Facilities) Special Tax Bonds, Series 2022 (the "Series 2022 Bonds") are being issued and delivered by the City of Ontario Community Facilities District No. 54 (Esperanza Facilities) (the "District") to (i) provide financing for certain authorized facilities and costs with respect thereto related to the development within the District, (ii) fund a reserve fund with respect to the Series 2022 Bonds, and (iii) pay the costs of issuance with respect to the Series 2022 Bonds. See "ESTIMATED SOURCES AND USES OF FUNDS" herein. The District has been formed by and is located in the City of Ontario, California (the "City").

The Series 2022 Bonds are authorized to be issued pursuant to the Mello-Roos Community Facilities Act of 1982, as amended (Section 53311 *et seq*. of the Government Code of the State of California), and pursuant to an Indenture, dated as of _____1, 2022, by and between the District and Zions Bancorporation, National Association, as trustee (the "Trustee"). The Series 2022 Bonds are special, limited obligations of the District and are payable solely from Net Special Tax Revenues (as defined herein), and the other assets pledged therefor under the Indenture, all as further described herein. Special Taxes (as defined herein) are to be levied according to the amended and restated rate and method of apportionment approved by the City Council of the City and the qualified electors within the District. The City Council is the legislative body of the District.

The Series 2022 Bonds are issuable in fully registered form and when issued will be registered in the name of Cede & Co., as nominee of The Depository Trust Company, New York, New York ("DTC"). Individual purchases of Series 2022 Bonds may be made in principal amounts of $5,000 and integral multiples thereof. Purchasers of Series 2022 Bonds will not receive certificates representing their beneficial ownership of the Series 2022 Bonds but will receive credit balances on the books of their respective nominees. Interest on the Series 2022 Bonds will be payable on each March 1 and September 1, commencing September 1, 2022. Principal of and interest on the Series 2022 Bonds will be paid by the Trustee to DTC for subsequent disbursement to DTC Participants who are expected to remit such payments to the beneficial owners of the Series 2022 Bonds. See "THE SERIES 2022 BONDS — General Provisions" and APPENDIX I — "INFORMATION CONCERNING THE DEPOSITORY TRUST COMPANY AND ITS BOOK-ENTRY SYSTEM" herein.

The Series 2022 Bonds are subject to optional and mandatory redemption as described under the caption "THE SERIES 2022 BONDS — Redemption."

NEITHER THE FAITH AND CREDIT NOR THE TAXING POWER OF THE DISTRICT (EXCEPT TO THE LIMITED EXTENT SET FORTH IN THE INDENTURE), THE CITY OR THE STATE OF CALIFORNIA, OR ANY POLITICAL SUBDIVISION THEREOF, IS PLEDGED TO THE PAYMENT OF THE SERIES 2022 BONDS. EXCEPT FOR NET SPECIAL TAX REVENUES, NO OTHER TAXES ARE PLEDGED TO THE PAYMENT OF THE SERIES 2022 BONDS. THE SERIES 2022 BONDS ARE NOT GENERAL OR SPECIAL OBLIGATIONS OF THE CITY BUT ARE SPECIAL, LIMITED OBLIGATIONS OF THE DISTRICT PAYABLE SOLELY FROM NET SPECIAL TAX REVENUES AND THE OTHER ASSETS PLEDGED THEREFOR UNDER THE INDENTURE AS MORE FULLY DESCRIBED HEREIN.

The purchase of the Series 2022 Bonds involves certain risks. See the section of this Official Statement entitled "SPECIAL RISK FACTORS" for a discussion of certain risk factors that should be considered, in addition to the other matters set forth herein, in evaluating the investment quality of the Series 2022 Bonds.

This cover page contains certain information for general reference only. It is not a summary of this issue. Investors are advised to read the entire Official Statement to obtain information essential to the making of an informed investment decision.

The Series 2022 Bonds are offered when, as and if issued and accepted by the Underwriter, subject to approval as to their legality by Orrick, Herrington & Sutcliffe LLP, Los Angeles, California, as Bond Counsel, and subject to certain other conditions. Certain legal matters will be passed on for the City and the District by Best Best & Krieger LLP, Ontario, California, as Issuer's Counsel, and by Stradling Yocca Carlson & Rauth, a Professional Corporation, Newport Beach, California, as Disclosure Counsel. Certain legal matters will be passed upon for the Underwriter by its counsel, Jones Hall, A Professional Law Corporation, San Francisco, California. It is anticipated that the Series 2022 Bonds will be available for delivery to DTC or its agent in book-entry form on or about May __, 2022.

[STIFEL LOGO]

Dated: April __, 2022

* *Preliminary, subject to change.*

This Preliminary Official Statement and the information contained herein are subject to completion or amendment. These securities may not be sold, nor may offers to buy them be accepted, prior to the time the Official Statement is delivered in final form. Under no circumstances shall this Preliminary Official Statement constitute an offer to sell or the solicitation of an offer to buy, nor shall there be any sale of, these securities in any jurisdiction in which such offer, solicitation or sale would be unlawful.

CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 54
(ESPERANZA FACILITIES)
SPECIAL TAX BONDS, SERIES 2022

MATURITY SCHEDULE
BASE CUSIP[†]: 68304N

Maturity Date (September 1)	***Principal Amount***	***Interest Rate***	***Yield***	***Price***	***CUSIP[†] No.***

$_____ _____% Term Bonds due September 1, 20__ Yield: _____% Price: _____ CUSIP[†] No. ___
$_____ _____% Term Bonds due September 1, 2052 Yield: _____% Price: _____ CUSIP[†] No. ___

† *CUSIP® is a registered trademark of the American Bankers Association. CUSIP Global Services (CGS) is managed on behalf of the American Bankers Association by FactSet Research Systems Inc. Copyright(c) 2022 CUSIP Global Services. All rights reserved. CUSIP® data herein is provided by CUSIP Global Services. This data is not intended to create a database and does not serve in any way as a substitute for the CGS database. CUSIP® numbers are provided for convenience of reference only. None of the Underwriter, the City or the District or their agents or counsel assume responsibility for the accuracy of such numbers.*

CITY OF ONTARIO

CITY COUNCIL

Paul S. Leon, Mayor
Alan D. Wapner, Mayor Pro Tem
Jim W. Bowman, Council Member
Debra Dorst-Porada, Council Member
Ruben Valencia, Council Member

STAFF

Scott Ochoa, City Manager
Darlene Sanchez, Assistant City Manager
Armen Harkalyan, Executive Director of Finance
James R. Milhiser, City Treasurer
Sheila Mautz, City Clerk
Best Best & Krieger LLP, City Attorney

BOND COUNSEL

Orrick, Herrington & Sutcliffe LLP
Los Angeles, California

MUNICIPAL ADVISOR

CSG Advisors Incorporated
San Francisco, California

DISCLOSURE COUNSEL

Stradling Yocca Carlson & Rauth, a Professional Corporation
Newport Beach, California

TRUSTEE

Zions Bancorporation, National Association
Los Angeles, California

SPECIAL TAX CONSULTANT

Goodwin Consulting Group, Inc.
Sacramento, California

APPRAISER

Kitty Siino & Associates, Inc.
Tustin, California

PRICE POINT CONSULTANT

Empire Economics, Inc.
Capistrano Beach, California

Except where otherwise indicated, all information contained in this Official Statement has been provided by the City and the District. No dealer, broker, salesperson or other person has been authorized by the City, the District, the Trustee or the Underwriter to give any information or to make any representations in connection with the offer or sale of the Series 2022 Bonds other than those contained herein and, if given or made, such other information or representations must not be relied upon as having been authorized by the City, the District, the Trustee or the Underwriter. This Official Statement does not constitute an offer to sell or the solicitation of an offer to buy nor shall there be any sale of the Series 2022 Bonds by a person in any jurisdiction in which it is unlawful for such person to make such an offer, solicitation or sale.

This Official Statement is not to be construed as a contract with the purchasers or owners of the Series 2022 Bonds. Statements contained in this Official Statement which involve estimates, forecasts or matters of opinion, whether or not expressly so described herein, are intended solely as such and are not to be construed as representations of fact.

The Underwriter has provided the following sentence for inclusion in this Official Statement:

The Underwriter has reviewed the information in this Official Statement in accordance with, and as a part of, its responsibilities to investors under the federal securities laws as applied to the facts and circumstances of this transaction, but the Underwriter does not guarantee the accuracy or completeness of such information.

The information and expressions of opinion herein are subject to change without notice and neither the delivery of this Official Statement nor any sale made hereunder shall, under any circumstances, create any implication that there has been no change in the affairs of the District or any other parties described herein since the date hereof. All summaries of the Indenture or other documents are made subject to the provisions of such documents respectively and do not purport to be complete statements of any or all of such provisions. Reference is hereby made to such documents on file with the District for further information in connection therewith.

Certain statements included or incorporated by reference in this Official Statement constitute "forward-looking statements" within the meaning of the United States Private Securities Litigation Reform Act of 1995, Section 21E of the United States Securities Exchange Act of 1934, as amended, and Section 27A of the United States Securities Act of 1933, as amended. Such statements are generally identifiable by the terminology used such as a "plan," "expect," "estimate," "project," "budget" or similar words. Such forward-looking statements include, but are not limited to certain statements contained in the information under the captions "THE COMMUNITY FACILITIES DISTRICT" and "PROPERTY OWNERSHIP AND THE DEVELOPMENT."

The achievement of certain results or other expectations contained in such forward-looking statements involve known and unknown risks, uncertainties and other factors which may cause actual results, performance or achievements described to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements. Except as set forth in the District's Continuing Disclosure Agreement, a form of which is attached hereto as APPENDIX G, neither the District nor the City plans to issue any updates or revisions to the forward-looking statements set forth in this Official Statement. GDC/CDG Esperanza PA 4 Venture, L.P., a Delaware limited partnership, the owner of the Ventana development within the District, has agreed to provide certain continuing disclosure information concerning GDC/CDG Esperanza PA 4 Venture, L.P. and its property within the District in the form attached hereto as APPENDIX H.

A wide variety of other information, including financial information concerning the City, is available from publications and websites of the City and others. No such information is a part of or incorporated into this Official Statement.

IN CONNECTION WITH THE OFFERING OF THE SERIES 2022 BONDS, THE UNDERWRITER MAY OVERALLOT OR EFFECT TRANSACTIONS WHICH STABILIZE OR MAINTAIN THE MARKET PRICE OF SUCH SERIES 2022 BONDS AT A LEVEL ABOVE THAT WHICH MIGHT OTHERWISE PREVAIL IN THE OPEN MARKET. SUCH STABILIZING, IF COMMENCED, MAY BE DISCONTINUED AT ANY TIME.

THE SERIES 2022 BONDS HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED, IN RELIANCE UPON AN EXEMPTION CONTAINED IN SUCH ACT. THE SERIES 2022 BONDS HAVE NOT BEEN REGISTERED OR QUALIFIED UNDER THE SECURITIES LAWS OF ANY STATE.

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[INSERT AREA MAP]

[INSERT AERIAL PHOTO]

$6,110,000*
CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 54
(ESPERANZA FACILITIES)
SPECIAL TAX BONDS, SERIES 2022

INTRODUCTION

This introduction is not a summary of this Official Statement. It is only a brief description of and guide to, and is qualified by, more complete and detailed information contained in the entire Official Statement, including the cover page and appendices hereto, and the documents summarized or described herein. A full review should be made of the entire Official Statement. The offering of the Series 2022 Bonds to potential investors is made only by means of the entire Official Statement.

The purpose of this Official Statement, which includes the cover page, the table of contents and the attached appendices, is to provide certain information concerning the issuance of the City of Ontario Community Facilities District No. 54 (Esperanza Facilities) Special Tax Bonds, Series 2022 in the aggregate principal amount set forth on the front cover page (the "Series 2022 Bonds"). The proceeds of the Series 2022 Bonds will be used to finance certain public facilities and costs with respect thereto related to the development within the City of Ontario Community Facilities District No. 54 (Esperanza Facilities) (the "District"), to fund a reserve fund for the Series 2022 Bonds (the "Reserve Fund"), and to pay costs of issuance of the Series 2022 Bonds.

The Series 2022 Bonds are being issued pursuant to the Mello-Roos Community Facilities Act of 1982, as amended (Section 53311 *et seq*. of the Government Code of the State of California) (the "Act"), and pursuant to the Indenture, dated as of _____ 1, 2022 (the "Indenture"), by and between the District and Zions Bancorporation, National Association, as trustee (the "Trustee"). The Series 2022 Bonds are secured under the Indenture by a pledge of, constituting a lien on and security interest in, the Net Special Tax Revenues (as defined herein) and any other amounts held in the Special Tax Fund, the Bond Fund and the Reserve Fund established pursuant to the Indenture.

This introduction is not a summary of this Official Statement. It is only a brief description of and guide to, and is qualified by, more complete and detailed information contained in the entire Official Statement and the documents summarized or described herein. A full review should be made of the entire Official Statement. The sale and delivery of the Series 2022 Bonds to potential investors is made only by means of the entire Official Statement. All capitalized terms used in this Official Statement and not defined shall have the meaning set forth in APPENDIX F — "SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE — Definitions" herein.

The District

The District is located in the southwestern portion of County of San Bernardino (the "County"), in the southern portion of the City of Ontario (the "City") within an area known as "Ontario Ranch" (formerly known as New Model Colony). The District consists of two neighborhoods known as "Dorado" and "Ventana," respectively. The Dorado site is generally bounded by Mill Creek Avenue to the west, Eucalyptus Avenue to the south, Amherst Avenue to the east and vacant lands to the north. The Dorado site consists of approximately 16.22 gross acres, all within Final Tract Map No. 17931. The Dorado site was owned by GDC/CDG Esperanza PA 10 Venture, L.P., a Delaware limited partnership ("Esperanza PA 10 Venture"). All of the units in Dorado have closed escrow to individual homeowners. The Ventana site is generally bounded by Hamner Avenue to the east, Eucalyptus Avenue to the south, Clifton Street to the west and vacant lands to

* *Preliminary, subject to change*.

the north. The Ventana site consists of approximately 8.65 gross acres, all within Final Tract Map No. 20285. The Ventana site is owned and being developed by GDC/CDG Esperanza PA 4 Venture, L.P., a Delaware limited partnership ("Esperanza PA 4 Venture" or the "Developer").

See "PROPERTY OWNERSHIP AND THE DEVELOPMENT — The Developer."

The property within the District as part of a master planned community known as "Esperanza." Esperanza is located within the Esperanza Specific Plan which at build-out is anticipated to include 1,410 dwelling units. Esperanza is part of a multiple phase, multiple master-planned community development known as "Ontario Ranch" (formerly known as New Model Colony). Ontario Ranch is planned to contain over 3,500 acres. At full buildout, Ontario Ranch is expected to include approximately 18,000 dwelling units, approximately 2.9 million square feet of industrial space, approximately 1.5 million square feet of commercial and retail space and over 500,000 square feet of business park space. While much of Ontario Ranch is raw vacant land, many planned communities within the east side of Ontario Ranch have been completed or are currently under construction. The City estimates that approximately 4,000 dwelling units have been built within Ontario Ranch to date.

As mentioned above, the Developer is building and selling homes in the District within a neighborhood named "Ventana;" Esperanza PA 10 Venture previously built and sold homes in the District within a neighborhood named "Dorado." At full buildout the District is anticipated to include 226 single-family detached and attached dwelling units. As of February 1, 2022, the date of value of the Appraisal (defined herein), the District included 100 completed residential units which had closed escrow to individual homeowners (all in Dorado), 3 model units under construction in Ventana and owned by the Developer, and 123 finished lots/pads (of which 15 were in escrow) in Ventana owned by the Developer. All of the homes within the Dorado neighborhood have been conveyed to individual homeowners. As of April 1, 2022, the District included ___ completed residential units which had closed escrow to individual homeowners, __ completed model units in Ventana owned by the Developer, __ completed residential units in Ventana owned by the Developer and __ residential units in various stages of construction (of which __ were in escrow) in Ventana owned by the Developer and ___ building pads in a finished condition in Ventana owned by the Developer. See "PROPERTY OWNERSHIP AND THE DEVELOPMENT — The Development Plan."

The District was formed to finance certain services, facilities and costs with respect thereto related to the development within the District. The Act was enacted by the California legislature to provide an alternative method of financing certain capital facilities and services, especially in developing areas of the State of California (the "State"). Any local agency (as defined in the Act) may establish a community facilities district to provide for and finance the cost of eligible facilities and services. The legislative body of the local agency which forms a community facilities district acts on behalf of such district as its legislative body. Subject to approval by two-thirds of the votes cast at an election and compliance with the other provisions of the Act, a legislative body of a local agency may issue bonds for a community facilities district and may levy and collect a special tax within such district to repay such indebtedness.

Pursuant to the Act, on April 7, 2020 the City Council of the City (the "City Council") adopted the necessary resolutions stating its intent to establish the District, to authorize the levy of special taxes on taxable property within the boundaries of the District based on an amended and restated rate and method of apportionment, and to have the District incur bonded indebtedness.

Following public hearings conducted pursuant to the provisions of the Act, the City Council adopted resolutions establishing the District and calling a special election to submit the levy of the special taxes and the incurring of bonded indebtedness to the qualified voters of the District. On May 19, 2020, at an election held pursuant to the Act, Esperanza PA 4 Venture and GDC/CDG Esperanza PA 10 Venture, L.P. ("Esperanza PA 10 Venture"), the qualified voters within the District at the time of the election, authorized the District to incur bonded indebtedness in the aggregate principal amount of not to exceed $25,000,000 and approved an

amended and restated rate and method of apportionment of the special taxes for the District to pay, among other things, the principal of and interest on the bonds of the District (the "Rate and Method" or "RMA").

The Rate and Method provides for a special tax (the "Special Tax") to be levied for the Special Tax Requirement. Under the Rate and Method, "Special Tax Requirement" is defined to mean for any Fiscal Year that amount required, after taking into account available amounts held in the funds and accounts established under the Indenture, for the District to: (i) pay debt service on all Outstanding Bonds (as defined herein) which is due in the calendar year that commences in such Fiscal Year; (ii) pay periodic costs on the Bonds, including, but not limited to, credit enhancement and rebate payments on the Bonds; (iii) pay Administrative Expenses (as defined in the Rate and Method); (iv) provide any amounts required to establish or replenish any reserve fund for the Bonds; (v) pay directly for acquisition or construction of Facilities (as defined in the Rate and Method), or the cost of Services (as defined in the Rate and Method), to the extent that the inclusion of such amounts does not increase the Special Tax levy on Final Mapped Property (as defined in the Rate and Method) or Undeveloped Property (as defined in the Rate and Method); (vi) without duplicating any amounts described in clause (iv), above, provide an amount equal to reasonably anticipated Special Tax delinquencies based on the delinquency rate for the Special Tax in the previous Fiscal Year as determined by the CFD Administrator, as limited by the Act. The Special Tax will be levied against certain property within the District pursuant to the Act, the Ordinance approving the levy of Special Taxes and the Indenture and in accordance with the Rate and Method. Under the Indenture, the portion of the Special Tax levied under the Rate and Method to pay for Services is not pledged to the payment of the Series 2022 Bonds or any Additional Bonds.

The City formed another overlapping community facilities district, the City of Ontario Community Facilities District No. 44 (Esperanza Services) ("CFD No. 44"), overlapping the boundaries of the District, within which the City levies a special tax for services. See Table 3.

Upon the issuance of the Series 2022 Bonds, a principal amount of $18,890,000* will remain authorized but unissued. Pursuant to the Indenture, the District shall not issue additional indebtedness secured by the Net Special Taxes Revenues (as such term is defined herein) on a parity with the Series 2022 Bonds except to refund the Series 2022 Bonds in whole or in part, and only in circumstances where the issuance of such Additional Bonds does not result in an increase in the amount of Annual Debt Service on the outstanding Series 2022 Bonds and Additional Bonds (together, the "Bonds") in each Bond Year so long as any Bonds are outstanding. Other taxes and/or special assessments with liens equal in priority to the continuing lien of the Special Taxes may be levied on the property within the District. See "SPECIAL RISK FACTORS — Parity Taxes and Special Assessments."

Security and Sources of Payment for the Series 2022 Bonds

Under the Indenture, the District has pledged to repay the Series 2022 Bonds from Net Special Tax Revenues and any other amounts held in the Special Tax Fund, the Bond Fund and the Reserve Fund. The Indenture defines "Net Special Tax Revenues" to mean Special Tax Revenues less amounts required to pay Administrative Expenses. The term "Special Tax Revenues" is defined in the Indenture to mean the proceeds of the Special Taxes received by or on behalf of the District, other than proceeds of Special Taxes levied to pay the costs of Services received by or on behalf of the District, including any prepayments thereof, interest and penalties thereon and proceeds of the redemption or sale of property sold as a result of foreclosure of the lien of the Special Taxes, which will be limited to the amount of said lien and interest and penalties thereon. "Services" has the meaning set forth in the Rate and Method. See APPENDIX A — "AMENDED AND RESTATED RATE AND METHOD OF APPORTIONMENT OF SPECIAL TAX." "Administrative Expenses" is defined in the Indenture to mean any reasonably necessary or appropriate expenses incurred in the administration of the District and the Bonds, including, but not limited to (a) the administrative and legal costs of levying and collecting the Special Taxes (including costs incurred in connection with any appeals

* *Preliminary, subject to change.*

relating thereto and litigation expenses incurred in connection with the collection of such Special Taxes), (b) the fees, costs and indemnification due the Trustee, (c) the costs incurred with on-going disclosure in connection with the Bonds, (d) the costs incurred in connection with the disclosure of the Special Taxes to property owners and potential purchasers of property, (e) the amounts required to calculate and pay arbitrage rebate payments to the federal government, and (f) an allocable share of the salaries of the City staff providing services on behalf of the District directly related to the foregoing and an allocable share of City general administrative overhead related thereto.

"Special Taxes" is defined in the Indenture to mean the special taxes approved by the qualified electors to be levied within the District pursuant to the Act and the Rate and Method.

Net Special Tax Revenues are the primary security for the repayment of the Series 2022 Bonds. In the event that Net Special Tax Revenues are not paid when due, the only sources of funds available to pay the debt service on the Series 2022 Bonds are the amounts held by the Trustee for such purpose in the Special Tax Fund, the Bond Fund and the Reserve Fund. See "SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2022 BONDS" herein.

NEITHER THE FAITH AND CREDIT NOR THE TAXING POWER OF THE DISTRICT (EXCEPT TO THE LIMITED EXTENT SET FORTH IN THE INDENTURE), THE CITY OR THE STATE, OR ANY POLITICAL SUBDIVISION THEREOF, IS PLEDGED TO THE PAYMENT OF THE SERIES 2022 BONDS. EXCEPT FOR THE NET SPECIAL TAX REVENUES, NO OTHER TAXES ARE PLEDGED TO THE PAYMENT OF THE SERIES 2022 BONDS. THE SERIES 2022 BONDS ARE NOT GENERAL OR SPECIAL OBLIGATIONS OF THE CITY BUT ARE SPECIAL, LIMITED OBLIGATIONS OF THE DISTRICT PAYABLE SOLELY FROM NET SPECIAL TAX REVENUES AND THE OTHER ASSETS PLEDGED THEREFOR UNDER THE INDENTURE AS MORE FULLY DESCRIBED HEREIN.

Description of the Series 2022 Bonds

The Series 2022 Bonds will be issued and delivered as fully registered bonds, registered in the name of Cede & Co. as nominee of The Depository Trust Company, New York, New York ("DTC"), and will be available to actual purchasers of the Series 2022 Bonds (the "Beneficial Owners") in the denominations of $5,000 and any integral multiple thereof under the book-entry system maintained by DTC, only through brokers and dealers who are or act through DTC Participants as described herein. Beneficial Owners will not be entitled to receive physical delivery of the Series 2022 Bonds. In the event that the book-entry only system described herein is no longer used with respect to the Series 2022 Bonds, the Series 2022 Bonds will be registered and transferred in accordance with the Indenture. See APPENDIX I — "INFORMATION CONCERNING THE DEPOSITORY TRUST COMPANY AND ITS BOOK-ENTRY SYSTEM" herein.

Principal of, premium, if any, and interest on the Series 2022 Bonds is payable by the Trustee to DTC. Disbursement of such payments to DTC Participants is the responsibility of DTC and disbursement of such payments to the Beneficial Owners is the responsibility of DTC Participants. In the event that the book-entry only system is no longer used with respect to the Series 2022 Bonds, the Beneficial Owners will become the registered owners of the Series 2022 Bonds and will be paid principal and interest by the Trustee, all as described herein. See APPENDIX I — "INFORMATION CONCERNING THE DEPOSITORY TRUST COMPANY AND ITS BOOK-ENTRY SYSTEM" herein.

The Series 2022 Bonds are subject to optional redemption, mandatory redemption from Special Tax prepayments and mandatory sinking fund redemption as described herein. For a more complete description of the Series 2022 Bonds and the basic documentation pursuant to which they are being sold and delivered, see "THE SERIES 2022 BONDS" and APPENDIX F — "SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE" herein.

Appraisal Report

The District has obtained an appraisal of the Taxable Property (as defined herein) included in the District with a date of value as of February 1, 2022 (the "Appraisal" or "Appraisal Report"). The Appraisal was prepared for the District by Kitty Siino & Associates, Inc., Tustin, California (the "Appraiser"). Subject to the limitations set forth in the Appraisal, the Appraiser is of the opinion that, as of February 1, 2022, the minimum market value of the property within the District was not less than $92,131,779 (the "Appraised Value"). See "THE COMMUNITY FACILITIES DISTRICT— Property Values" and "— Value-to-Lien Ratios." A copy of the Appraisal is included as APPENDIX B to this Official Statement. It is a condition precedent to the issuance of the Series 2022 Bonds that the Appraiser deliver a certificate stating that nothing has come to the attention of the Appraiser subsequent to the date of the Appraisal that would lead the Appraiser to believe that the value of the Taxable Property in the District is less than the minimum market value of such property reported in the Appraisal.

Price Point Study

In connection with the formation of the District, the City hired Empire Economics, Inc., Capistrano Beach, California (the "Price Point Consultant"), to prepare a price point study of the prices of the homes planned within the District, dated January 17, 2020 (the "Original Price Point Study"). The City hired the Price Point Consultant to conduct an update to the Original Price Point Study within the District, dated February 18, 2020 (the "Revised Price Point Study"). The Special Tax rates set forth in the Rate and Method were based in part on the prices set forth in the Revised Price Point Study. In connection with and in preparation for the issuance of the Series 2022 Bonds, the City hired the Price Point Consultant to conduct an update to the Revised Price Point Study within the District, dated February 2, 2022 (the "Updated Price Point Study"). Pursuant to Section C of the Rate and Method, upon the issuance of Bonds, the City is required to amend the Assigned Special Tax (as defined in the Rate and Method) to the extent necessary to cause the total effective tax burden for residential property in the District to not exceed 1.95% of the minimum sales prices set forth in the Updated Price Point Study. Based on the Updated Price Point Study provided by the Price Point Consultant, the City will not reduce the Assigned Special Tax rates set forth in Section C of the Rate and Method, as the total effective tax burden applicable to each land use class of residential property to be constructed within the District will not exceed 1.95% of the minimum sales prices set forth in the Updated Price Point Study. A copy of the Updated Price Point Study is included as APPENDIX C to this Official Statement. See "SECURITY AND SOURCES FOR THE SERIES 2022 BONDS — Rate and Method of Apportionment."

Professionals Involved in the Offering

Zions Bancorporation, National Association, Los Angeles, California, will act as Trustee under the Indenture. Stifel, Nicolaus & Company, Incorporated is the Underwriter of the Series 2022 Bonds. The validity of the Series 2022 Bonds and certain other legal matters are subject to the approving opinion of Orrick, Herrington & Sutcliffe LLP, Bond Counsel to the District. CSG Advisors Incorporated, San Francisco, California, is acting as Municipal Advisor for the District in connection with the Series 2022 Bonds. Kitty Siino & Associates, Inc., Tustin, California, is acting as the Appraiser to the District. Goodwin Consulting Group, Inc. is acting as the Special Tax Consultant to the District. Empire Economics, Inc. is acting as the Price Point Consultant to the District. Certain legal matters will be passed on for the City and the District by Best Best & Krieger LLP, Ontario, California, in its capacity as Issuer's Counsel, and Stradling Yocca Carlson & Rauth, a Professional Corporation, Newport Beach, California, as Disclosure Counsel. Certain legal matters will be passed upon for the Underwriter by its counsel, Jones Hall, A Professional Law Corporation, San Francisco, California.

For information concerning respects in which certain of the above-mentioned professionals, advisors, counsel and agents may have a financial or other interest in the offering of the Series 2022 Bonds, see "FINANCIAL INTERESTS" herein.

Continuing Disclosure

The District will agree to provide, or cause to be provided, to the Municipal Securities Rulemaking Board's Electronic Municipal Market Access system available on the Internet at *http://emma.msrb.org* ("EMMA") certain annual financial information and operating data. The District will further agree to provide notice of certain listed events. These covenants will be made in order to assist the Underwriter in complying with Securities and Exchange Commission Rule 15c2-12(b)(5) (the "Rule"). See "CONTINUING DISCLOSURE" herein. See the form of District Continuing Disclosure Agreement attached as APPENDIX G hereto (the "District Continuing Disclosure Agreement") for a description of the specific nature of the annual reports to be filed by the District and notices of listed events to be provided by the District.

In addition, the Developer will agree to provide or cause to be provided to EMMA certain information on a semi-annual basis with respect to the Developer and its property ownership and development within the District and notice of certain listed events until the date on which at least 181 of the planned 226 residential units within the District have been conveyed to homebuyers. See the form of the Developer Continuing Disclosure Agreement attached as APPENDIX H hereto (the "Developer Continuing Disclosure Agreement") for a description of the specific nature of the semi-annual reports to be filed by the Developer, and notices of listed events to be provided by the Developer.

Series 2022 Bond Owners' Risks

Certain events could affect the ability of the District to pay the principal of and interest on the Series 2022 Bonds when due. See the section of this Official Statement entitled "SPECIAL RISK FACTORS" for a discussion of certain factors which should be considered, in addition to other matters set forth herein, in evaluating an investment in the Series 2022 Bonds.

Other Information

This Official Statement speaks only as of its date, and the information contained herein is subject to change.

Brief descriptions of the Series 2022 Bonds and the Indenture are included in this Official Statement. Such descriptions and information do not purport to be comprehensive or definitive. All references herein to the Indenture, the Series 2022 Bonds and the constitution and laws of the State as well as the proceedings of the City Council, acting as the legislative body of the District, are qualified in their entirety by references to such documents, laws and proceedings, and with respect to the Series 2022 Bonds, by reference to the Indenture.

Copies of the Indenture, the District Continuing Disclosure Agreement and other documents and information referred to herein are available for inspection and (upon request and payment to the City of a charge for copying, mailing and handling) for delivery from the City at 303 East "B" Street, Ontario, California 91764, Attention: City Manager.

ESTIMATED SOURCES AND USES OF FUNDS

The following table sets forth the expected sources and uses of Series 2022 Bond proceeds and certain other amounts.

Sources:	
Principal Amount of the Series 2022 Bonds	$
Plus: Original Issue Premium	
Less: Underwriter's Discount	
Plus: Funds on Hand[(1)]	
Total	$
Uses:	
GDC/CDG Esperanza Acquisition Account of the Improvement Fund[(2)]	$
NMC Acquisition Account of the Improvement Fund[(3)]	
Special Tax Bond	
Administrative Expense Fund	
Reserve Fund[(4)]	
Cost of Issuance Fund[(5)]	
Total	$

(1) Includes a portion of the Special Taxes collected for Fiscal Years 2020-21 and 2021-22.
(2) Reflects amounts owed or to be owed to Esperanza PA 4 Venture, for the construction of eligible facilities under the Act.
(3) Reflects amounts owed or to be owed to NMC Builders, LLC for the construction of eligible facilities under the Act.
(4) Equal to the initial Reserve Requirement.
(5) Includes fees of Bond Counsel and Disclosure Counsel, printing costs, municipal advisor fees, Trustee fees, Appraiser fees, Price Point Consultant fees and other costs of issuance of the Series 2022 Bonds.

THE SERIES 2022 BONDS

General Provisions

The Series 2022 Bonds will be issued in fully registered form without coupons in denominations of $5,000 and any integral multiple thereof ("Authorized Denominations"). The Series 2022 Bonds will be dated the date of issuance thereof. The Series 2022 Bonds are scheduled to mature on September 1, in the years and in the principal amounts, and will bear interest at the rates per annum, shown on the inside front cover page of this Official Statement. Interest on the Series 2022 Bonds will be computed on the basis of a 360-day year comprised of twelve 30-day months and will be payable on March 1 and September 1 of each year, commencing September 1, 2022 (each an "Interest Payment Date"). Interest on each Series 2022 Bond will be payable from the Interest Payment Date next preceding the date of authentication thereof unless (i) such Series 2022 Bond is authenticated on or before an Interest Payment Date and after the close of business on the fifteenth calendar day of the month preceding such Interest Payment Date, whether or not such day is a Business Day (the "Record Date") in which event interest thereon will be payable from such Interest Payment Date, (ii) such Series 2022 Bond is authenticated on or before the first Record Date, in which event interest thereon will be payable from the Closing Date or (iii) interest on such Series 2022 Bond is in default as of the date of authentication thereof, in which event interest thereon will be payable from the date to which interest has been previously paid or duly provided for.

The interest on, and principal of and redemption premiums, if any, on the Series 2022 Bonds are payable in lawful money of the United States of America. Interest is payable by check of the Trustee mailed by first class mail, postage prepaid, on each Interest Payment Date to the Owners of the Series 2022 Bonds at their respective addresses shown on the Registration Books as of the close of business on the preceding Record Date (except that interest on any Series 2022 Bond which is not punctually paid or duly provided for on any Interest Payment Date will, if and to the extent that amounts subsequently become available therefor, be

payable on a payment date established by the Trustee to the Person in whose name the ownership of such Series 2022 Bond is registered on the Registration Books at the close of business on a special record date to be established by the Trustee pursuant to the Indenture). Payment of principal of any Series 2022 Bond will be made only upon presentation and surrender thereof at maturity or upon earlier redemption at the Office of the Trustee.

The Series 2022 Bonds will initially be issued in book-entry form, and DTC will act as securities depository. So long as the Series 2022 Bonds are held in book-entry form, principal of, premium, if any, and interest on the Series 2022 Bonds will be paid by the Trustee directly to DTC for distribution to the Beneficial Owners of the Series 2022 Bonds in accordance with procedures adopted by DTC. See APPENDIX I — "INFORMATION CONCERNING THE DEPOSITORY TRUST COMPANY AND ITS BOOK-ENTRY SYSTEM."

The Series 2022 Bonds are not general or special obligations of the City but are special, limited obligations of the District payable solely from Net Special Tax Revenues and the other amounts held under the Indenture in the Special Tax Fund, the Bond Fund and the Reserve Fund. Neither the faith and credit nor the taxing power of the District (except to the limited extent set forth in the Indenture), the City, the State or any political subdivision thereof, is pledged to the payment of the Series 2022 Bonds. See "SPECIAL RISK FACTORS —Bonds Are Limited Obligations."

Redemption

Optional Redemption.[*] The Series 2022 Bonds maturing on and after September 1, 20__, shall be subject to optional redemption, in whole, or in part in Authorized Denominations, on any Interest Payment Date on or after September 1, 20__ from any source of available funds, at the following respective Redemption Prices (expressed as percentages of the principal amount of the Series 2022 Bonds to be redeemed), plus accrued interest thereon to the date of redemption:

Redemption Dates	*Redemption Price*
September 1, 2029 and March 1, 2030	103%
September 1, 2030 and March 1, 2031	102
September 1, 2031 and March 1, 2032	101
September 1, 2032 and any Interest Payment Date thereafter	100

Mandatory Redemption from Special Tax Prepayments.[*] The Series 2022 Bonds are subject to mandatory redemption, in whole, or in part in Authorized Denominations, on any Interest Payment Date, from and to the extent of prepaid Special Taxes required to be applied thereto and any related proportional amounts in the Reserve Fund required to be applied thereto pursuant to the Indenture (see "SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2022 BONDS — Reserve Fund") at the following respective Redemption Prices (expressed as percentages of the principal amount of the Series 2022 Bonds to be redeemed), plus accrued interest thereon to the date of redemption:

Redemption Dates	*Redemption Price*
September 1, 2022 through March 1, 2030	103%
September 1, 2030 and March 1, 2031	102
September 1, 2031 and March 1, 2032	101
September 1, 2032 and any Interest Payment Date thereafter	100

[*] *Preliminary, subject to change.*

See the caption "SPECIAL RISK FACTORS— Potential Early Redemption of Bonds from Special Tax Prepayments" for a discussion of the potential for a lower than expected yield on the Series 2022 Bonds as a result of a special mandatory redemption from prepayment of Special Taxes.

Mandatory Sinking Fund Redemption. The Series 2022 Bonds maturing September 1, 20__ shall be subject to mandatory sinking fund redemption, in part, on September 1 in each year, commencing September 1, 20__, at a Redemption Price equal to the principal amount of the Series 2022 Bonds maturing September 1, 20__ to be redeemed, without premium, plus accrued interest thereon to the date of redemption, in the aggregate respective principal amounts in the respective years as follows:

Sinking Fund Redemption Date (September 1)	***Principal Amount to be Redeemed***
	$

(Maturity)

If some but not all of the Series 2022 Bonds maturing September 1, 20__ are redeemed pursuant to the optional redemption provisions of the Indenture described above, the principal amount of the Series 2022 Bonds maturing September 1, 20__ to be redeemed pursuant to mandatory sinking fund redemption as described above on any subsequent September 1 shall be reduced, by $5,000 or an integral multiple thereof, as designated by the District in a Written Certificate of the District filed with the Trustee; provided, however, that the aggregate amount of such reductions shall not exceed the aggregate amount of the Series 2022 Bonds maturing September 1, 20__ so optionally redeemed. If some but not all of the Series 2022 Bonds maturing September 1, 20__ are redeemed pursuant to the mandatory redemption from Special Tax prepayments provisions of the Indenture described above, the principal amount of the Series 2022 Bonds maturing September 1, 20__ to be redeemed pursuant to mandatory sinking fund redemption as described above on any subsequent September 1 shall be reduced by the aggregate principal amount of the Series 2022 Bonds maturing September 1, 20__ so redeemed, such reduction to be allocated among redemption dates as nearly as practicable on a pro rata basis in amounts of $5,000 or integral multiples thereof, as determined by the Trustee, notice of which determination shall be given by the Trustee to the District.

The Series 2022 Bonds maturing September 1, 20__ shall be subject to mandatory sinking fund redemption, in part, on September 1 in each year, commencing September 1, 20__, at a Redemption Price equal to the principal amount of the Series 2022 Bonds maturing September 1, 20__ to be redeemed, without premium, plus accrued interest thereon to the date of redemption, in the aggregate respective principal amounts in the respective years as follows:

Sinking Fund Redemption Date (September 1)	***Principal Amount to be Redeemed***
	$

(Maturity)

If some but not all of the Series 2022 Bonds maturing September 1, 20__ are redeemed pursuant to the optional redemption provisions of the Indenture described above, the principal amount of the Series 2022 Bonds maturing September 1, 20__ to be redeemed pursuant to mandatory sinking fund redemption as described above on any subsequent September 1 shall be reduced, by $5,000 or an integral multiple thereof, as designated by the District in a Written Certificate of the District filed with the Trustee; provided, however, that the aggregate amount of such reductions shall not exceed the aggregate amount of the Series 2022 Bonds maturing September 1, 20__ so optionally redeemed. If some but not all of the Series 2022 Bonds maturing September 1, 20__ are redeemed pursuant to the mandatory redemption from Special Tax prepayments provisions of the Indenture described above, the principal amount of the Series 2022 Bonds maturing September 1, 20__ to be redeemed pursuant to mandatory sinking fund redemption as described above on any subsequent September 1 shall be reduced by the aggregate principal amount of the Series 2022 Bonds maturing September 1, 20__ so redeemed, such reduction to be allocated among redemption dates as nearly as practicable on a pro rata basis in amounts of $5,000 or integral multiples thereof, as determined by the Trustee, notice of which determination shall be given by the Trustee to the District.

Selection of Bonds for Redemption. Whenever provision is made in the Indenture for the redemption of less than all of the Bonds, the Trustee will select the Bonds to be redeemed from all Bonds not previously called for redemption (i) with respect to any optional redemption of Bonds of a Series, among maturities of the Bonds of such Series as directed in a Written Request of the District, and (ii) with respect to any mandatory redemption of Bonds from prepayments of Special Taxes, among maturities of all Series of Bonds on a *pro rata* basis as nearly as practicable. The Trustee shall select for redemption the Bonds of the same Series with the same maturity by lot in any manner in which the Trustee, in its sole discretion, shall deem appropriate. For purposes of such selection, all Bonds shall be deemed to be comprised of separate $5,000 denominations, and such separate denominations shall be treated as separate Bonds that may be separately redeemed.

Notice of Redemption. If the Bonds are held in book-entry form, notice of redemption will be mailed to DTC and not to the Beneficial Owners of the Bonds under the DTC book-entry system. Neither the District nor the Trustee is responsible for giving notice of redemption to the Beneficial Owners. See APPENDIX I — "INFORMATION CONCERNING THE DEPOSITORY TRUST COMPANY AND ITS BOOK-ENTRY SYSTEM" herein.

The Indenture provides that the Trustee on behalf and at the expense of the District will give notice of any redemption by first class mail to the respective Owners of any Bonds designated for redemption at their respective addresses appearing on the Registration Books at least 30 but not more than 60 days prior to the date fixed for redemption. Such notice of redemption will state the date of the notice, the redemption date, the redemption place and the Redemption Price and shall designate the CUSIP numbers, if any, the Bond numbers and the maturity or maturities of the Bonds to be redeemed (except in the event of redemption of all of the Bonds of such maturity or maturities in whole). The notice of redemption will require that the Bonds to be redeemed be surrendered at the Office of the Trustee for redemption at the Redemption Price, and give notice that further interest on such Bonds will not accrue from and after the date fixed for redemption. Neither the failure to receive any notice so mailed, nor any defect in such notice, will affect the validity of the proceedings for the redemption of the Bonds or the cessation of accrual of interest thereon from and after the date fixed for redemption.

If, on said date fixed for redemption, moneys for the Redemption Price of all the Bonds to be redeemed, together with interest to said date, is held by the Trustee so as to be available therefor on such date, and, if notice of redemption thereof will have been mailed as aforesaid and not canceled, then, from and after said date, interest on said Bonds will cease to accrue and become payable. All moneys held by or on behalf of the Trustee for the redemption of Bonds will be held in trust for the account of the Owners of the Bonds so to be redeemed without liability to such Owners for interest thereon. With respect to any notice of any optional redemption of Bonds, unless at the time such notice is given the Bonds to be redeemed shall be deemed to have been paid within the meaning of the Indenture, such notice will state that such redemption is conditional upon receipt by the Trustee, on or prior to the date fixed for such redemption, of moneys that, together with

other available amounts held by the Trustee, are sufficient to pay the Redemption Price of, and accrued interest on, the Bonds to be redeemed, and that if such moneys shall not have been so received said notice shall be of no force and effect and the District will not be required to redeem such Bonds. In the event a notice of redemption of Bonds contains such a condition and such moneys are not so received, the redemption of Bonds as described in the conditional notice of redemption will not be made and the Trustee will, within a reasonable time after the date on which such redemption was to occur, give notice to the Persons and in the manner in which the notice of redemption was given, that such moneys were not so received and that there shall be no redemption of Bonds pursuant to such notice of redemption.

Debt Service Schedule

Year Ending September 1	***Principal***	***Interest***	***Total***

SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2022 BONDS

General

The Series 2022 Bonds are special, limited obligations of the District payable solely from Net Special Tax Revenues and the other assets pledged therefor under the Indenture. The Indenture defines "Net Special Tax Revenues" to mean Special Tax Revenues less amounts required to pay Administrative Expenses. Under

the Indenture, the portion of the Special Tax levied under the Rate and Method to pay for Services (as defined in the Rate and Method) is not pledged to the payment of the Series 2022 Bonds or any Additional Bonds. Accordingly, the term "Special Tax Revenues" is defined in the Indenture to mean the proceeds of the Special Taxes received by or on behalf of the District, other than proceeds of Special Taxes levied to pay the costs of Services received by or on behalf of the District, including any prepayments thereof, interest and penalties thereon and proceeds of the redemption or sale of property sold as a result of foreclosure of the lien of the Special Taxes (which shall be limited to the amount of said lien and interest and penalties thereon). The Indenture defines the term "Special Taxes" as the special taxes approved by the qualified electors to be levied within the District pursuant to the Act and the Rate and Method. "Services" has the meaning set forth in the Rate and Method. See APPENDIX A — "AMENDED AND RESTATED RATE AND METHOD OF APPORTIONMENT OF SPECIAL TAX." "Administrative Expenses" is defined in the Indenture to mean any reasonably necessary or appropriate expenses incurred in the administration of the District and the Bonds, including, but not limited to (a) the administrative and legal costs of levying and collecting the Special Taxes (including costs incurred in connection with any appeals relating thereto and litigation expenses incurred in connection with the collection of such Special Taxes), (b) the fees, costs and indemnification due the Trustee, (c) the costs incurred with on-going disclosure in connection with the Bonds, (d) the costs incurred in connection with the disclosure of the Special Taxes to property owners and potential purchasers of property, (e) the amounts required to calculate and pay arbitrage rebate payments to the federal government, and (f) an allocable share of the salaries of the City staff providing services on behalf of the District directly related to the foregoing and an allocable share of City general administrative overhead related thereto.

Under the Rate and Method, parcels of Taxable Property are classified as Developed Property (each as defined in the Rate and Method) if a building permit has been obtained for such parcel by May 1 of the fiscal year preceding the Special Tax levy. As of May 1, 2021, 90 building permits had been issued for units within the District. In Fiscal Year 2020-21, the first year Special Taxes were levied in the District, Special Taxes in the amount of $58,263 were levied on 18 parcels classified as Developed Property. In Fiscal Year 2021-22, Special Taxes in the amount of $291,040 were levied on 90 parcels classified as Developed Property within the District. As of April 1, 2022, there are __ parcels classified as Developed Property within the District. See "THE COMMUNITY FACILITIES DISTRICT — Delinquency History." Under no circumstances may the amount of Special Taxes levied by the District in any year exceed the maximum rates approved by the qualified electors within the District, as set forth in the Rate and Method. A copy of the Rate and Method is attached to this Official Statement as APPENDIX A.

In addition to the Net Special Tax Revenues, any other amounts held by the Trustee in the Special Tax Fund, the Bond Fund and the Reserve Fund are pledged pursuant to the Indenture to secure the payment of the principal of, premium, if any, and interest on the Series 2022 Bonds and any Additional Bonds in accordance with their respective terms, the Indenture and the Act. However, those amounts are pledged subject to the provisions of the Indenture permitting the application thereof for the purposes set forth in the Indenture. Amounts on deposit in the Improvement Fund, the Costs of Issuance Fund, the Redemption Fund, the Administrative Expense Fund and the Rebate Fund are not pledged to the payment of any of the Series 2022 Bonds or any Additional Bonds.

NEITHER THE FAITH AND CREDIT NOR THE TAXING POWER OF THE DISTRICT (EXCEPT TO THE LIMITED EXTENT SET FORTH IN THE INDENTURE), THE CITY OR THE STATE, OR ANY POLITICAL SUBDIVISION THEREOF, IS PLEDGED TO THE PAYMENT OF THE SERIES 2022 BONDS. EXCEPT FOR THE NET SPECIAL TAX REVENUES, NO OTHER TAXES ARE PLEDGED TO THE PAYMENT OF THE SERIES 2022 BONDS. THE SERIES 2022 BONDS ARE NOT GENERAL OR SPECIAL OBLIGATIONS OF THE CITY BUT ARE SPECIAL, LIMITED OBLIGATIONS OF THE DISTRICT PAYABLE SOLELY FROM NET SPECIAL TAX REVENUES AND THE OTHER ASSETS PLEDGED THEREFOR UNDER THE INDENTURE AS MORE FULLY DESCRIBED HEREIN.

Special Taxes

Pursuant to the Act, the City Council adopted a resolution on April 7, 2020 stating its intention to establish the District and to levy a special tax within the District. In accordance with the provisions of the Act, the City Council established the District on May 19, 2020 for the purpose of financing certain public infrastructure improvements necessary for the proposed development within the District. At a special election held on May 19, 2020, Esperanza PA 4 Venture and Esperanza PA 10 Venture, the qualified voters within the District at the time of the election, authorized the District to incur indebtedness in an amount not to exceed $25,000,000 and approved the Rate and Method to, among other things, pay the principal of and interest on the bonds of the District. The Rate and Method approved by the City Council and the qualified electors on May 19, 2020 is set forth in APPENDIX A hereto.

Pursuant to Section C of the Rate and Method, prior to the issuance of the Series 2022 Bonds, the City is required to determine if the Assigned Special Tax (as defined in the Rate and Method) is required to be reduced to the extent necessary to cause the total effective tax burden for single family property in the District to not exceed 1.95% of the minimum sales prices set forth in the Updated Price Point Study, all as further described in Section C of the Rate and Method. A copy of the Updated Price Point Study is included as APPENDIX C to this Official Statement. Based on the conclusions of the Updated Price Point Study, the City will not amend the Rate and Method in connection with the issuance of the Series 2022 Bonds. See "— Rate and Method of Apportionment" below.

Pursuant to the Indenture, the District has covenanted that it will fix and levy the amount of Special Taxes in each Fiscal Year in accordance with the Rate and Method in an amount sufficient (subject to the limitations contained in the Rate and Method as to the maximum Special Tax that may be levied) to yield Special Tax Revenues in the amount required for (i) the payment of principal of and interest on any Outstanding Bonds becoming due and payable during the Corresponding Bond Year, (ii) any necessary replenishment of the Reserve Fund, and (iii) the payment of Administrative Expenses estimated to be paid from such Special Tax Revenues, taking into account the balances in the funds and accounts established under the Indenture. See APPENDIX F — "SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE — Certain Covenants Under the Indenture." Notwithstanding this covenant, the amount of Special Taxes actually collected each year may be less than the amount described for a variety of different reasons. See "SPECIAL RISK FACTORS — Levy of the Special Tax."

The Series 2022 Bonds have been structured so that Assigned Special Tax rates set forth in the Rate and Method that may be levied within the District, based on the expected buildout of the District, are at least 110% of debt service on the Series 2022 Bonds in each Bond Year. The Special Taxes levied in any fiscal year may not exceed the maximum rates authorized pursuant to the Rate and Method. See APPENDIX A — "AMENDED AND RESTATED RATE AND METHOD OF APPORTIONMENT OF SPECIAL TAX." There is no assurance that the Net Special Tax Revenues will, in all circumstances, be adequate to pay the principal of and interest on the Series 2022 Bonds when due. Pursuant to the Act, the Special Taxes levied in any fiscal year against any parcel of residential property in the District may not be increased as a consequence of delinquency or default by the owners of any other parcels within the District by more than 10% above the amount that would have been levied in that fiscal year had there never been any such delinquencies or default. See "SPECIAL RISK FACTORS — Levy of the Special Tax" and "— Exempt Properties."

The City formed another overlapping community facilities district, CFD No. 44, overlapping the boundaries of the District, within which the City levies a special tax for services. See Table 3.

Rate and Method of Apportionment

General. The Rate and Method is to be applied by the District each Fiscal Year for the purpose of determining the amount of the Special Tax to be levied against each Assessor's Parcel of Taxable Property within the District. For purposes of the discussion of the Rate and Method only, terms with initial capital

letters that are not otherwise defined in this Official Statement shall have the respective meanings assigned to them in the Rate and Method, a copy of which appears in APPENDIX A.

Under the terms of the Indenture, prior to August 1 of each year, the District will ascertain from the County Assessor the relevant parcels on which the Special Taxes are to be levied, taking into account any parcel splits during the preceding and then current year. The District will levy the Special Taxes by August 10 of each Fiscal Year that the Series 2022 Bonds are Outstanding, or otherwise such that the computation of the levy is complete before the final date on which the auditor of the County (the "Auditor") will accept the transmission of the Special Tax amounts for the parcels within the District for inclusion on the next real property tax roll. Upon the completion of the computation of the amounts of the levy, the District will prepare, or cause to be prepared, and shall transmit to the Auditor, such data as the Auditor requires to include the levy of the Special Taxes on the next real property tax roll.

The Special Taxes levied in any Fiscal Year may not exceed the maximum rates authorized pursuant to the Rate and Method. See APPENDIX A — "AMENDED AND RESTATED RATE AND METHOD OF APPORTIONMENT OF SPECIAL TAX" hereto. There is no assurance that the proceeds of the Special Taxes will, in all circumstances, be adequate to pay the principal of and interest on the Series 2022 Bonds when due. See "SPECIAL RISK FACTORS — Levy of the Special Tax" herein.

Amended and Restated Rate and Method of Apportionment of Special Tax. The District is legally authorized and has covenanted to cause the levy of the Special Taxes in an amount determined according to a methodology, *i.e.*, the Rate and Method, which the City Council and the qualified electors within the District have approved. The Rate and Method apportions the total amount of the Special Taxes to be collected among the Taxable Property in the District as more particularly described below. The City formed another overlapping community facilities district, CFD No. 44, overlapping the boundaries of the District, within which the City levies a special tax for services. See Table 3.

The following is a synopsis of the provisions of the Rate and Method, which should be read in conjunction with the complete text of the Rate and Method which is attached as APPENDIX A — "AMENDED AND RESTATED RATE AND METHOD OF APPORTIONMENT OF SPECIAL TAX." The meanings of the capitalized but undefined terms used in this section are as set forth in APPENDIX A — "AMENDED AND RESTATED RATE AND METHOD OF APPORTIONMENT OF SPECIAL TAX" hereto. This section provides only a summary of the Rate and Method, and is qualified by more complete and detailed information contained in the Rate and Method attached as APPENDIX A.

"*CFD Administrator*" means an official of the City responsible for determining the Special Tax Requirement, providing for the levy and collection of the Special Taxes, and performing other duties provided for in the Rate and Method.

"*Developed Property*" means, for each Fiscal Year, all Taxable Property, exclusive of Final Mapped Property, Taxable Property Owner Association Property, and Taxable Public Property, for which a building permit or other applicable permit for new construction was issued after January 1, 2019, and before May 1 of the prior Fiscal Year.

"*Final Mapped Property*" means, for each Fiscal Year, all Taxable Property, exclusive of Developed Property, Taxable Property Owner Association Property, and Taxable Public Property, which as of January 1 of the previous Fiscal Year was located within a Final Subdivision Map. The term Final Mapped Property shall include any parcel map or Final Subdivision Map, or portion thereof, that creates individual lots for which a building permit may be issued, including Parcels that are designated as a remainder Parcel (i.e., one where the size, location, etc., precludes any further subdivision or taxable use).

"*Lower Income Household Welfare Exemption Property*" means, for each Fiscal Year, an Assessor's Parcel within the boundaries of the District that is subject to a welfare exemption under subdivision (g) of

Section 214 of the California Revenue and Taxation Code (or any successor statute), as indicated in the most recent County assessor's roll finalized prior to such Fiscal Year.

"*Residential Floor Area*" means all of the Square Footage of living area within the perimeter of a Unit, not including any carport, walkway, garage, overhang, patio, enclosed patio, or similar area. The determination of Residential Floor Area shall be as set forth in the building permit(s) issued for such Assessor's Parcel, or as set forth in other official records maintained by the City's Building Department or other appropriate means selected by the District. The actual Square Footage shall be rounded up to the next whole square foot. Once such determination has been made for an Assessor's Parcel, it shall remain fixed in all future Fiscal Years unless an appeal pursuant to Section F of the Rate and Method is approved that results in a change in the actual Square Footage.

"*Special Tax*" means the special tax authorized by the qualified electors of the District to be levied within the boundaries of the District.

"*Special Tax Requirement*" means, for any Fiscal Year that amount required, after taking into account available amounts held in the funds and accounts established under the Indenture, for the District to: (i) pay debt service on all Outstanding Bonds which is due in the calendar year that commences in such Fiscal Year; (ii) pay periodic costs on the Bonds, including, but not limited to, credit enhancement and rebate payments on the Bonds; (iii) pay Administrative Expenses; (iv) provide any amounts required to establish or replenish any reserve fund for the Bonds; (v) pay directly for acquisition or construction of Facilities, or the cost of Services, to the extent that the inclusion of such amounts does not increase the Special Tax levy on Final Mapped Property or Undeveloped Property; (vi) without duplicating any amounts described in clause (iv) above, provide an amount equal to reasonably anticipated Special Tax delinquencies based on the delinquency rate for the Special Tax in the previous Fiscal Year as determined by the CFD Administrator, as limited by the Act.

"*Taxable Property*" means, for each Fiscal Year, all of the Assessor's Parcels within the boundaries of the District which are not exempt from the Special Tax pursuant to law or described below under the subheading "— *Exempt Property*."

"*Taxable Property Owner Association Property*" means, for each Fiscal Year, all Assessor's Parcels of Property Owner Association Property that are not exempt from the Special Tax pursuant to Section E of the Rate and Method.

"*Taxable Public Property*" means, for each Fiscal Year, all Assessor's Parcels of Public Property that are not exempt from the Special Tax pursuant to law or as described below under the subheading "— *Exempt Property*," and further described in Section E of the Rate and Method attached hereto as APPENDIX A.

"*Undeveloped Property*" means, for each Fiscal Year, all Taxable Property not classified as Developed Property, Final Mapped Property, Taxable Public Property, or Taxable Property Owner Association Property.

Exempt Property. No Special Tax shall be levied on up to 4.72 Acres of Public Property and up to 3.67 Acres of Property Owner Association Property, as described further in this paragraph. Tax-exempt status will be assigned by the CFD Administrator in the chronological order in which property becomes Public Property or Property Owner Association Property. Property Owner Association Property or Public Property that is not exempt from the Special Tax under the Rate and Method shall be subject to the levy of the Special Tax and shall be taxed Proportionately as part of the fifth or sixth step, respectively, in Section D of the Rate and Method, up to 100% of the applicable Maximum Special Tax for Taxable Property Owner Association Property and Taxable Public Property. No Special Tax shall be levied in any Fiscal Year on Assessor's Parcels that have fully prepaid the Special Tax obligation pursuant to the formula set forth in Section H of the Rate and Method.

Under the Rate and Method, no Special Tax shall be levied on Lower Income Household Welfare Exemption Property; provided, however, that if, in any Fiscal Year, applicable law does not require that Lower Income Household Welfare Exemption Property be exempt from some portion, or all, of the Special Tax, such portion, or all, of the Special Tax shall be levied on such property in accordance with the Rate and Method based on the Land Use Class to which the Assessor's Parcel is assigned. Senate Bill 1473, the "Local Government Omnibus Act of 2020," amended Government Code Section 53340(c) to provide that in a community facilities district in which the levy of a special tax is authorized by an ordinance adopted on or after January 1, 2020, a property receiving a welfare exemption under subdivision (g) of Section 214 of the California Revenue and Taxation Code shall be exempt from the special tax unless debt is outstanding and the property was subject to the special tax prior to receiving the exemption, in which case the property shall remain subject to the special tax and the special tax shall be enforceable against the property. Therefore, pursuant to the Rate and Method and California law, and given that no property is subject to the welfare exemption as of the date hereof, the Special Tax shall be applicable to Lower Income Household Welfare Exemption Property so long as the Bonds are outstanding.

Maximum Special Tax, Assigned Special Tax and Backup Special Tax. The Maximum Special Tax, Assigned Special Tax and Backup Special Tax for the Special Tax provided for in the Rate and Method is as follows:

Special Tax.

Developed Property. The Maximum Special Tax that may be levied in any Fiscal Year for each Assessor's Parcel classified as Developed Property will be the greater of (i) the amount derived by application of the Assigned Special Tax or (ii) the amount derived by application of the Backup Special Tax.

Assigned Special Tax. Single Family Detached Property will be assigned to Land Use Classes 1 through 7, Single Family Attached Property will be assigned to Land Use Classes 8 through 14, Other Residential Property will be assigned to Land Use Class 15 and Non-Residential Property shall be assigned to Land Use Class 16 as listed in Table 1 in Section C of the Rate and Method. The Assigned Special Tax applicable to an Assessor's Parcel classified as Single Family Detached Property ranges from $2,574 per unit for units with a Residential Floor Area of less than 2,201 square feet to $3,761 per unit for units with a Residential Floor Area greater than 3,200 square feet. The Assigned Special Tax applicable to an Assessor's Parcel classified as Single Family Attached Property ranges from $1,090 per unit for units with a Residential Floor Area of less than 901 square feet to $1,840 per unit for units with a Residential Floor Area greater than 1,900 square feet. The Assigned Special Tax applicable to an Assessor's Parcel classified as Other Residential Property and Non-Residential Property is $32,813 per acre. Based on the Updated Price Point Study provided by the Price Point Consultant, the Assigned Special Tax rates set forth in Section C of the Rate and Method are not required to be reduced so that the total effective tax burden applicable to each land use class of residential property to be constructed within the District will not exceed 1.95% of the minimum sale prices set forth in the Updated Price Point Study, as required by Section C of the Rate and Method. A copy of the Updated Price Point Study is included as APPENDIX C to this Official Statement.

Backup Special Tax. The Backup Special Tax for an Assessor's Parcel of Developed Property is $3,235 per Unit for Single Family Detached Property and $1,473 per Unit for Single Family Attached Property, although subject to adjustment as set forth in Section C.1.a.(3) of the Rate and Method.

Final Mapped Property, Taxable Public Property, Taxable Property Owner Association Property and Undeveloped Property. The Maximum Special Tax for Final Mapped Property, Taxable Public Property, Taxable Property Owner Association Property, and Undeveloped Property is $32,813 per acre, and shall not be subject to increase or reduction and, therefore, shall remain the same in every Fiscal Year.

Method of Apportionment of Special Tax. Each Fiscal Year, beginning with Fiscal Year 2020-21, the CFD Administrator will determine the Special Tax Requirement and, subject to the Maximum Special Tax rates described above, the Special Tax will then be levied as follows:

First: If needed to satisfy the Special Tax Requirement, the Special Tax shall be levied Proportionately on each Assessor's Parcel of Developed Property up to 100% of the applicable Assigned Special Tax;

Second: If additional monies are needed to satisfy the Special Tax Requirement after the first step has been completed, then the Special Tax shall be levied Proportionately on each Assessor's Parcel of Final Mapped Property up to 100% of the Maximum Special Tax for Final Mapped Property;

Third: If additional monies are needed to satisfy the Special Tax Requirement after the first two steps have been completed, then the Special Tax shall be levied Proportionately on each Assessor's Parcel of Undeveloped Property up to 100% of the Maximum Special Tax for Undeveloped Property;

Fourth: If additional monies are needed to satisfy the Special Tax Requirement after the first three steps have been completed, then the levy of the Special Tax on each Assessor's Parcel of Developed Property whose Maximum Special Tax is determined through the application of the Backup Special Tax shall be increased Proportionately from the Assigned Special Tax up to the Maximum Special Tax for each such Assessor's Parcel;

Fifth: If additional monies are needed to satisfy the Special Tax Requirement after the first four steps have been completed, then the Special Tax shall be levied Proportionately on each Assessor's Parcel of Taxable Property Owner Association Property up to the Maximum Special Tax for Taxable Property Owner Association Property; and

Sixth: If additional monies are needed to satisfy the Special Tax Requirement after the first five steps have been completed, then the Special Tax shall be levied Proportionately on each Assessor's Parcel of Taxable Public Property up to the Maximum Special Tax for Taxable Public Property.

Notwithstanding the above, under no circumstances shall the Special Tax levied in any Fiscal Year on any Assessor's Parcel of Single Family Property or Other Residential Property for which an occupancy permit for private residential use has been issued be increased as a result of delinquency or default by the owner or owners of any other Assessor's Parcel or Assessor's Parcels within the District by more than ten percent above the amount that would have been levied in that Fiscal Year had there never been any such delinquencies or defaults.

Under the Indenture, the portion of the Special Tax levied under the Rate and Method to pay for Services (as defined in the Rate and Method) is not pledged to the payment of the Series 2022 Bonds or any Additional Bonds. Accordingly, as used in this Official Statement, including the description of the apportionment of the Special Tax, the term "Special Tax Revenues" means the proceeds of the Special Taxes received by or on behalf of the District, other than proceeds of Special Taxes levied to pay the costs of Services received by or on behalf of the District, including any prepayments thereof, interest and penalties thereon and proceeds of the redemption or sale of property sold as a result of foreclosure of the lien of the Special Taxes, which will be limited to the amount of said lien and interest and penalties thereon.

Prepayment of Special Tax. The Special Tax obligation for an Assessor's Parcel of Taxable Property for which a building permit has been issued, may be prepaid in full, or in part, and only if there are no delinquent Special Taxes with respect to such Assessor's Parcel at the time of prepayment, provided that the terms set forth under Section H of the Rate and Method are satisfied. The Prepayment Amount is calculated based on the Bond Redemption Amount plus Redemption Premium plus the Future Facilities Amount plus the Defeasance Amount plus the Administrative Fees and Expenses, less a credit for the resulting reduction in the

Reserve Requirement for the Bonds (if any), all as specified in APPENDIX A — "AMENDED AND RESTATED RATE AND METHOD OF APPORTIONMENT OF SPECIAL TAX — Section H."

Mandatory redemption of Series 2022 Bonds from Special Tax prepayments may result in the reduction in the otherwise expected yield on such Series 2022 Bonds if the Series 2022 Bonds were purchased at a price greater than par. See "SPECIAL RISK FACTORS — Potential Early Redemption of Bonds from Special Tax Prepayments."

Estimated Debt Service Coverage. The principal amount of the Series 2022 Bonds has been established to produce debt service coverage on the Series 2022 Bonds from Net Special Tax Revenues of at least 110%. The District may levy up to the Maximum Special Tax rates on Taxable Property within the District. See "— Rate and Method of Apportionment — *Maximum Special Tax, Assigned Special Tax and Backup Special Tax*" and "— Rate and Method of Apportionment — *Exempt Property*."

Pursuant to the Rate and Method, the status of Developed Property is based on building permits issued as of May 1 of the Fiscal Year preceding the Fiscal Year for which the Special Tax is levied. Based on the development status within the District as of April 1, 2022, ___ parcels of Taxable Property will be classified as Developed Property for Fiscal Year 2022-23. See "PROPERTY OWNERSHIP AND THE DEVELOPMENT" and "SPECIAL RISK FACTORS — Failure to Develop Properties."

In Fiscal Year 2020-21, the first year Special Taxes were levied within the District, Special Taxes in the amount of $58,263 were levied on 18 parcels classified as Developed Property. In Fiscal Year 2021-22, Special Taxes in the amount of $291,040 were levied on 90 parcels classified as Developed Property within the District. See "THE COMMUNITY FACILITIES DISTRICT — Delinquency History."

Table 1 below sets forth the projected Special Tax levy for Fiscal Year 2022-23 by property classification as of February 1, 2022 and as expected at build out.

TABLE 1
CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 54
(ESPERANZA FACILITIES)
SUMMARY OF PROJECTED FISCAL YEAR 2022-23
SPECIAL TAX LEVY AND EXPECTED LAND USES

	Projected Fiscal Year 2022-23 Special Tax Levy[1]					*Buildout of Expected Land Uses*			
Special Tax Category	***Residential Floor Area (Sq. Ft.)***	***No. of Units or Acres***	***Special Tax Rate[2]***	***Per Unit or Acre***	***Annual Special Tax Revenues***	***No. of Units or Acres[3]***	***Maximum or Assigned Special Tax[2][4]***	***Per Unit or Acre***	***Annual Special Tax Revenues[5]***
Developed Property[6]									
Single Family Detached Property		Units				Units			
	<2,201	0	$ 2,574	per Unit	$ 0	0	$ 2,574	per Unit	$ 0
	2,201-2,400	0	2,848	per Unit	0	0	2,848	per Unit	0
	2,401-2,600	31	3,016	per Unit	93,496	31	3,016	per Unit	93,496
	2,601-2,800	32	3,216	per Unit	102,912	32	3,216	per Unit	102,912
	2,801-3,000	37	3,441	per Unit	127,317	37	3,441	per Unit	127,317
	3,001-3,200	0	3,579	per Unit	0	0	3,579	per Unit	0
	>3,200	0	3,761	per Unit	0	0	3,761	per Unit	0
Single Family Attached Property									
	<901	0	$ 1,090	per Unit	$ 0	0	$ 1,090	per Unit	$ 0
	901-1,100	0	1,166	per Unit	0	0	1,166	per Unit	0
	1,101-1,300	1	1,312	per Unit	1,312	42	1,312	per Unit	55,104
	1,301-1,500	1	1,484	per Unit	1,484	42	1,484	per Unit	62,328
	1,501-1,700	1	1,623	per Unit	1,623	42	1,623	per Unit	68,166
	1,701-1,900	0	1,766	per Unit	0	0	1,766	per Unit	0
	>1,900	0	1,840	per Unit	0	0	1,840	per Unit	0
Subtotal – Developed Property		103	Units		$ 328,144	226	Units		$ 509,323
		Acres				Acres			
Final Mapped Property[7]		0.00	$ 32,813	per Acre	$ 0	0.00	$ 32,813	per Acre	$ 0
Undeveloped Property[8]		8.37	16,476	per Acre	137,900	0.00	32,813	per Acre	0
Grand Total					**$ 466,044**				**$ 509,323**

(1) Based on the building permits issued as of February 1, 2022 and assumes no further development. Includes the debt service due in 2023 on the Series 2022 Bonds and estimated Administrative Expenses in the amount of $89,244.
(2) Reflects the final Assigned Special Tax rates. No reductions were required pursuant to Section C.1 of the Rate and Method.
(3) Expected land uses are subject to change as development occurs.
(4) For Developed Property, the Assigned Special Tax rates are shown. For Final Mapped Property and Undeveloped Property, the Maximum Special Tax rate is shown.
(5) Does not include potential revenues from a Backup Special Tax levy on Developed Single Family Detached Property or Single Family Attached Property.
(6) For the projected Fiscal Year 2022-23 Special Tax levy, includes all taxable parcels which have had a building permit issued by the City prior to February 1, 2022 and assumes no further development.
(7) For the projected Fiscal Year 2022-23 Special Tax levy, includes all taxable parcels which were located within a final subdivison map as of January 1, 2022 and assumes no new final maps will be recorded.
(8) The projected Fiscal Year 2022-23 Special Tax levy on Undeveloped Property is subject to change as development occurs.

Sources: City; Special Tax Consultant.

Collection and Application of Special Taxes

The Special Taxes are levied and collected by the Treasurer-Tax Collector of the County in the same manner and at the same time as *ad valorem* property taxes; provided, however, that the District may directly bill the Special Taxes, may collect Special Taxes at a different time or in a different manner if necessary to

meet its financial obligations, and may covenant to foreclose and may actually foreclose on delinquent Assessor's Parcels as permitted by the Act.

The District has made certain covenants in the Indenture for the purpose of ensuring that the current maximum rates and method of collection of the Special Taxes are not altered in a manner that would impair the District's ability to collect sufficient Special Taxes to pay debt service on the Bonds and Administrative Expenses when due. First, the District has covenanted that it will not initiate proceedings under the Act to modify the Rate and Method if such modification would adversely affect the security for the Bonds and if an initiative is adopted that purports to modify the Rate and Method in a manner that would adversely affect the security for the Bonds, the District shall, to the extent permitted by law, commence and pursue reasonable legal actions to prevent the modification of the Rate and Method in a manner that would adversely affect the security for the Bonds. See "SPECIAL RISK FACTORS — Constitutional Limitations on Taxation and Appropriations." Second, the District has covenanted not to authorize owners of taxable parcels within the District to satisfy Special Tax obligations by the tender of Bonds unless the District shall have first obtained a report of an Independent Consultant certifying that doing so would not result in the District having insufficient Special Tax Revenues to pay the principal of and interest on all Outstanding Bonds when due.

Although the Special Taxes constitute liens on Taxable Property within the District, they do not constitute a personal indebtedness of the owners of such property within the District. Moreover, other overlapping general obligation debt already exists on the property located within the District and other future special tax and assessment liens and overlapping general obligation debt could come into existence in the future in certain situations without the consent or knowledge of the City or the landowners therein. See "SPECIAL RISK FACTORS — Parity Taxes and Special Assessments" herein. There is no assurance that property owners will be financially able to pay the annual Special Taxes or that they will pay such taxes even if financially able to do so, all as more fully described in the section of this Official Statement entitled "SPECIAL RISK FACTORS."

Under the terms of the Indenture, the Trustee shall establish and maintain a separate fund designated the "Special Tax Fund." As soon as practicable after the receipt by the District of any Special Tax Revenues, but in any event no later than the date ten Business Days after such receipt, the District shall transfer such Special Tax Revenues to the Trustee for deposit in the Special Tax Fund; provided, however, that any portion of any such Special Tax Revenues that represents prepaid Special Taxes that are to be applied to the payment of the redemption price of Bonds in accordance with the provisions of the Indenture shall be identified to the Trustee as such by the District and shall be deposited in the Redemption Fund. See "— Special Tax Fund" below, "THE SERIES 2022 BONDS — Redemption — *Mandatory Redemption from Special Tax Prepayments*" and APPENDIX F — "SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE."

Covenant for Superior Court Foreclosure

Pursuant to Section 53356.1 of the Act, the District has covenanted in the Indenture that it will determine or cause to be determined, no later than August 15 of each year, whether or not any owners of property within the District are delinquent in the payment of Special Taxes and that, if such delinquencies exist, the District will order and cause to be commenced no later than October 1, and thereafter diligently prosecute, an action in the superior court to foreclose the lien of any Special Taxes or installment thereof not paid when due. Notwithstanding the foregoing, the District is not required under the Indenture to order the commencement of foreclosure proceedings if (a) the total Special Tax delinquency in the District for such Fiscal Year is less than 5% of the total Special Taxes levied in such Fiscal Year, and (b) the amount then on deposit in the Reserve Fund is equal to the Reserve Requirement. Notwithstanding the foregoing, if the District determines that any single parcel is delinquent in excess of $7,500 in the payment of the Special Taxes, then the District will diligently institute, prosecute and pursue foreclosure proceedings against such parcel.

The mere commencement of foreclosure proceedings will not assure a prompt and favorable resolution of Special Tax delinquencies. The ability of the District to foreclose the lien of delinquent unpaid Special Taxes may be limited. See "SPECIAL RISK FACTORS — Bankruptcy and Legal Delays" and "— FDIC/Federal Government Interests in Properties." Moreover, even if a judgment of foreclosure and order of sale is obtained, the District must cause a notice of levy to be issued. Under current law, the property owner has 120 days from the date of service of the notice of levy in which to redeem the subject property. If the property owner fails to redeem the property and it is sold, the property owner's only remedy is an action to set aside the sale, which action must be brought within 90 days of the date of sale. If such an action results in the setting aside of the foreclosure sale, the judgment is revived, and the District would be entitled to receive interest on the revived judgment as if the sale had not been made. Under former law a property owner had a period of one year within which to redeem property to be sold, and the constitutionality of the legislation that eliminated the one year redemption period has not been tested.

There can be no assurance that, even if the subject property is sold, the proceeds from such sale will be sufficient to pay the delinquent installments of the Special Tax. The Act does not require the District or any other governmental agency to purchase or otherwise acquire any Assessor's Parcel being sold if there is no other purchaser at such sale. The Act does require that property being sold pursuant to foreclosure under the Act must be sold for not less than the judgment amount (which must include reasonable attorneys' fees, together with interest, penalties, and other authorized charges and costs) plus post judgment interest and authorized costs, unless a lower bid price is authorized by the Owners of not less than 75% by value of the Series 2022 Bonds Outstanding.

Special Tax Fund

The Indenture provides that the Trustee will establish and maintain a separate fund designated the "Special Tax Fund." The Indenture requires that the District transfer Special Tax Revenues (other than prepaid Special Taxes) to the Trustee for deposit into the Special Tax Fund as soon as practicable after the District's receipt thereof, but in any event no later than ten Business Days after such receipt. No later than the Business Day immediately preceding each Interest Payment Date, after having made any requested transfers to the Administrative Expense Fund, as requested by the District, to have sufficient amounts available therein to pay Administrative Expenses, the Trustee is required by the Indenture to make transfers from the Special Tax Fund to the Interest Account in the Bond Fund, the Principal Account in the Bond Fund and the Reserve Fund in the amounts and in the priority specified in the Indenture. See APPENDIX F — "SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE."

As soon as practicable after the District's receipt of prepaid Special Taxes, but in any event no later than ten Business Days after such receipt, the District is required to transfer any prepaid Special Taxes to the Trustee and, in connection therewith, deliver to the Trustee a Written Certificate identifying such amounts as prepaid Special Taxes, identifying the portion of such prepaid Special Taxes so transferred that is to be applied to the Redemption Price of the Bonds and identifying the portion of such prepaid Special Taxes that is to be applied to the payment of interest on the Bonds to be so redeemed. The portion of such prepaid Special Taxes that is to be applied to the Redemption Price will be deposited by the Trustee in the Redemption Fund and will be applied to the redemption of the Bonds pursuant to the Indenture. The portion of such prepaid Special Taxes that is to be applied to the payment of interest on the Bonds to be so redeemed will be deposited by the Trustee in the Interest Account and will be applied to the payment of such interest.

Reserve Fund

The Indenture provides that the Trustee will establish and maintain a special fund designated the "Reserve Fund." On the Closing Date, the Trustee will deposit in the Reserve Fund the amount specified under the caption "ESTIMATED SOURCES AND USES OF FUNDS." The Trustee is also required, no later than the Business Day immediately preceding each Interest Payment Date, to transfer from the Special Tax Fund (after the requisite transfers to the Administrative Expense Fund, the Interest Account and the Principal

Account) the amount, if any, necessary to cause the amount on deposit in the Reserve Fund to be equal to the Reserve Requirement. The Indenture defines "Reserve Requirement" to mean, as of the date of any calculation, the least of (i) "10% of the proceeds of the issue," within the meaning of Section 148 of the Code, with respect to the Bonds (excluding from such calculation Bonds refunded with the proceeds of subsequently issued Bonds), (ii) Maximum Annual Debt Service and (iii) 125% of Average Annual Debt Service.

Except as otherwise provided in the Indenture, all amounts in the Reserve Fund are to be used and withdrawn by the Trustee solely for the purpose of (i) making transfers to the Interest Account in accordance with the Indenture in the event of any deficiency in the Interest Account of the amount then required for payment of the interest on the Bonds, (ii) making transfers to the Principal Account in accordance with the Indenture in the event of any deficiency in the Principal Account of the amount then required for payment of the principal of the Bonds, and (iii) redeeming Bonds in accordance with the Indenture as described in the following paragraph.

Whenever Bonds are to be optionally redeemed or redeemed from Special Tax prepayments, a proportionate share (determined as provided below) of the amount on deposit in the Reserve Fund will, on the date on which amounts to redeem such Bonds are deposited in the Redemption Fund or otherwise deposited with the Trustee, be transferred by the Trustee from the Reserve Fund to the Redemption Fund or to such deposit held by the Trustee and will be applied to the redemption of said Bonds; provided that, such amount will be so transferred only if and to the extent that the amount remaining on deposit in the Reserve Fund will be at least equal to the Reserve Requirement (excluding from the calculation thereof said Bonds to be redeemed). Such proportionate share will be equal to the largest integral multiple of the minimum Authorized Denomination for said Bonds that is not larger than the amount equal to the product of (i) the amount on deposit in the Reserve Fund on the date of such transfer, times (ii) a fraction, the numerator of which is the principal amount of Bonds to be so redeemed and the denominator of which is the principal amount of Bonds to be Outstanding on the day prior to the date on which such Bonds are to be so redeemed.

Whenever the balance in the Reserve Fund exceeds the amount required to redeem or pay the Outstanding Bonds, including interest accrued to the date of payment or redemption and premium, if any, due upon redemption, the Trustee will, upon receipt of a Written Request of the District, transfer the amount in the Reserve Fund to the Interest Account, Principal Account and/or Redemption Fund, as applicable, to be applied, on the next succeeding Interest Payment Date to the payment and redemption of all of the Outstanding Bonds. If, as a result of the scheduled payment of principal of or interest on the Bonds, the Reserve Requirement is reduced, the Trustee will transfer an amount equal to the amount of such reduction to the Interest Account.

Investment of Moneys

All moneys held by the Trustee in any of the funds or accounts established pursuant to the Indenture are required to be invested by the Trustee solely in Permitted Investments, as directed in writing by the District. As used in the Indenture, the phrase "Permitted Investments" includes a variety of investments, some of which may not be rated by a national rating service. See APPENDIX F — "SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE — Definitions."

No Additional Bonds Except for Refunding Bonds

So long as any of the Series 2022 Bonds remain Outstanding, the District will not issue any Additional Bonds or obligations payable from Net Special Tax Revenues senior to the Series 2022 Bonds. The District may issue Additional Bonds or obligations payable on a parity with the Series 2022 Bonds, if, among other things: (i) upon the issuance of such Additional Bonds, no Event of Default will occur or be continuing under the Indenture; (ii) the proceeds of the Additional Bonds will be applied to refund the Series 2022 Bonds or Additional Bonds previously issued under the Indenture, pay Costs of Issuance incurred in connection with the issuance of such Additional Bonds, and/or make any requisite deposit to the Reserve Fund; and (iii) the Annual Debt Service in each Bond Year, calculated for all Bonds that will be Outstanding after the issuance of such

Additional Bonds, will be less than or equal to Annual Debt Service in such Bond Year, calculated for all Bonds that are Outstanding immediately prior to the issuance of such Additional Bonds. Nothing contained in the Indenture limits the issuance of any special tax bonds payable from Special Taxes if, after the issuance and delivery of such special tax bonds, none of the Bonds theretofore issued under the Indenture will be Outstanding. See APPENDIX F — "SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE."

THE COMMUNITY FACILITIES DISTRICT

General Information Regarding the District

The District was formed to finance certain services, facilities and costs with respect thereto related to the development within the District. The qualified electors within the boundaries of the District, being the then owners of property in the District, authorized the District to incur bonded indebtedness to finance certain facilities to meet the needs of new development within the District and approved the Rate and Method for, and authorized the levy of, the Special Tax.

The District is located in the southwestern portion of San Bernardino County, in the southern portion of the City within an area known as "Ontario Ranch" (formerly known as New Model Colony). The District consists of two neighborhoods known as "Dorado" and "Ventana," respectively. The Dorado site is generally bounded by Mill Creek Avenue to the west, Eucalyptus Avenue to the south, Amherst Avenue to the east and vacant lands to the north. The Dorado site consists of approximately 16.22 gross acres, all within Final Tract Map No. 17931. The Ventana site is generally bounded by Hamner Avenue to the east, Eucalyptus Avenue to the south, Clifton Street to the west and vacant lands to the north. The Ventana site consists of approximately 8.65 gross acres, all within Final Tract Map No. 20285.

The property within the District is being developed into two neighborhoods named "Dorado" and "Ventana" within a master planned community known as "Esperanza." At full buildout the District is anticipated to include 226 single-family detached and attached dwelling units. Esperanza is located within the Esperanza Specific Plan which at build-out is anticipated to include 1,410 dwelling units. Esperanza is part of a multiple phase, multiple master-planned community development known as "Ontario Ranch" (formerly known as New Model Colony). Ontario Ranch is planned to contain over 3,500 acres. At full buildout, Ontario Ranch is expected to include approximately 18,000 dwelling units, approximately 2.9 million square feet of industrial space, approximately 1.5 million square feet of commercial and retail space and over 500,000 square feet of business park space. While most of Ontario Ranch is raw vacant land, many planned communities within the east side of Ontario Ranch have been completed or are currently under construction. The City estimates that approximately 4,000 dwelling units have been built to date.

As of February 1, 2022, the District included 100 completed residential units which had closed escrow to individual homeowners (comprising the entirety of the Dorado neighborhood), 3 model units under construction In Ventana and owned by the Developer and 123 finished lots/pads (of which 15 were in escrow) in Ventana owned by the Developer. As of April 1, 2022, the District included __ completed residential units which had closed escrow to individual homeowners, __ completed model units in Ventana owned by the Developer, __ completed residential units in Ventana owned by the Developer, __ residential units in various stages of construction (of which __ were in escrow) in Ventana owned by the Developer and __ building pads in a finished condition in Ventana owned by the Developer. See "PROPERTY OWNERSHIP AND THE DEVELOPMENT — The Development Plan." A detailed description of the status of the construction as of the date of value of the Appraisal is included in APPENDIX B — "APPRAISAL REPORT."

Under the City's General Plan (Land Use Plan LU-01) land within the Dorado neighborhood is designated as "Low Density Residential", which allows for 2.1 to 5.0 dwelling units per acre while land within the Ventana neighborhood is designated as "Medium Density Residential" which allows for 11.1 to 25.0 dwelling units per acre. As built and proposed, development within the District legally conforms to these requirements.

Water and sewer service to the property within the District will be supplied by the City. Electricity will be supplied by Southern California Edison, and gas by Southern California Gas Company.

Like all of Southern California, the land within the District is subject to seismic activity. The District is not located in a designated Earthquake Study Zone. However, the Chino-Central Avenue fault is located approximately 5 miles west of the District and the Cucamonga Fault Zone is located approximately 20 miles north of the District. See "SPECIAL RISK FACTORS — Geologic, Topographic and Climatic Conditions."

Like much of the property within the City and surrounding areas, the property within the District has previously been utilized as dairy pastures and agricultural fields. An updated Methane Gas Investigation Report was prepared by LGC Geo-Environmental, Inc. dated January 14, 2020. The report identified that the District was outside of the methane study area and that methane gas in the Dorado and Ventana neighborhoods was either not detected or less than the level that requires any type of remediation. No additional methane investigations were recommended. See "SPECIAL RISK FACTORS — Methane Gas."

The Federal Emergency Management Agency has determined that the District is located in a Zone "X" flood area (an area of minimal flooding, within the 500-year flood plain), and flood insurance will not be required. See "SPECIAL RISK FACTORS — Geologic, Topographic and Climatic Conditions."

An aerial photo showing the property within the District and a map showing the general location of the District and the surrounding area appears on the pages before Page 1 of this Official Statement. More detailed information about the property therein is contained in APPENDIX B — "APPRAISAL REPORT," and information about the ownership of such property is set forth under the caption "PROPERTY OWNERSHIP AND THE DEVELOPMENT." General information about the City is set forth in APPENDIX E.

The Facilities

The City and Esperanza PA 4 Venture entered into an Acquisition and Funding Agreement, dated as of May 1, 2020 (the "Acquisition Agreement"), which provides, among other things, the means by which certain facilities will be financed in connection with the development within the District, including street and traffic circulation system improvements (the "Facilities").

Pursuant to the Acquisition Agreement, Esperanza PA 4 Venture agreed to construct, and the City agreed to accept, certain Facilities to be acquired with the proceeds of the Series 2022 Bonds and available Special Taxes deposited into the GDC/CDG Esperanza Acquisition Account of the Improvement Fund under the Indenture pursuant to certain requirements contained in the Acquisition Agreement and the Indenture. The Acquisition Agreement also provides guidelines pursuant to which the City may acquire completed segments of the Facilities with the proceeds of the Series 2022 Bonds and available Special Taxes deposited into the GDC/CDG Esperanza Acquisition Account of the Improvement Fund.

Pursuant to the Acquisition Agreement, Esperanza PA 4 Venture has agreed to pay all costs of the Facilities that it constructs pursuant to the Acquisition Agreement in excess of the moneys available therefor in the GDC/CDG Esperanza Acquisition Account of the Improvement Fund. Further, any lack of availability of amounts in the GDC/CDG Esperanza Acquisition Account of the Improvement Fund to pay the acquisition costs of the Facilities shall in no way diminish any obligation of Esperanza PA 4 Venture with respect to the construction of or contributions for public facilities and mitigation measures required by the conditions of approval or any subdivision, development, or other agreement to which Esperanza PA 4 Venture is a party, or any governmental approval to which Esperanza PA 4 Venture or any land within the District is subject, except to the extent expressly set forth in such agreement or approval.

As of February 1, 2022, all of the Facilities to be constructed by Esperanza PA 4 Venture that are required to serve the development within the District have been substantially completed, pending final approval and acceptance by the City.

Certain facilities (the "NMC Facilities") were constructed pursuant to an Acquisition and Funding Agreement, dated as of July 21, 2015 (the "NMC Acquisition Agreement"), by and between the City and NMC Builders, LLC, a California limited liability company ("NMC Builders"). In addition to the Facilities constructed by the Developer under the Acquisition Agreement, bond proceeds may be deposited into an NMC Acquisition Account of the Improvement Fund under the Indenture to finance the costs of certain NMC Facilities constructed by NMC Builders and acquired by the City pursuant to the NMC Acquisition Agreement or to reimburse NMC Builders for its prior advances to the City for the costs of certain NMC Facilities. NMC Builders is an entity established by certain current and previous landowners within Ontario Ranch for the purpose of jointly funding and managing the construction of much of the major public infrastructure required for the development of the eastern portion of Ontario Ranch, including some of the facilities being financed through the issuance of the Series 2022 Bonds.

Direct and Overlapping Debt

The District is included within the boundaries of numerous overlapping local agencies providing governmental services. Some of these local agencies have outstanding bonds, and/or the authority to issue bonds, payable from taxes or assessments. The existing and authorized indebtedness payable from taxes and assessments that may be levied upon the property within the District is shown in Table 2 below. In addition to current debt, new community facilities districts and/or special assessment districts could be formed in the future encompassing all or a portion of the property within the District; and such districts or the agencies that formed them could issue more bonds and levy additional special taxes or assessments.

TABLE 2
CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 54
(ESPERANZA FACILITIES)
DIRECT AND OVERLAPPING DEBT

2021-22 Assessed Valuation: $36,506,385

DIRECT AND OVERLAPPING TAX AND ASSESSMENT DEBT:	% Applicable	Debt 3/1/22
Metropolitan Water District General Obligation Bonds	0.001%	$ 217
Chaffey Community College District General Obligation Bonds	0.027	84,957
Chaffey Union High School District General Obligation Bonds	0.051	262,444
Mountain View School District SFID No. 1 General Obligation Bonds	0.447	37,992
Mountain View School District SFID No. 2 General Obligation Bonds	1.127	213,883
City of Ontario Community Facilities District No. 54	**100.**	**0**[1]
TOTAL DIRECT AND OVERLAPPING TAX AND ASSESSMENT DEBT		$599,493
OVERLAPPING GENERAL FUND DEBT:		
San Bernardino County General Fund Obligations	0.014%	$ 25,785
San Bernardino County Pension Obligation Bonds	0.014	16,433
San Bernardino County Flood Control District General Fund Obligations	0.014	6,141
Chaffey Community College District Certificates of Participation	0.027	7,630
City of Ontario General Fund Obligations	0.113	67,851
City of Ontario Pension Obligation Bonds	0.113	263,444
West Valley Vector Control District Certificates of Participation	0.037	698
TOTAL OVERLAPPING GENERAL FUND DEBT		$387,982
COMBINED TOTAL DEBT		$987,475[2]

Ratios to 2021-22 Local Secured Assessed Valuation:

Direct Debt ($0).....0
Total Direct and Overlapping Tax and Assessment Debt..... 60.90:1
Combined Total Debt..... 36.97:1

(1) Excludes Series 2022 Bonds.
(2) Excludes tax and revenue anticipation notes, enterprise revenue, mortgage revenue and non-bonded capital lease obligations.
Source: California Municipal Statistics, Inc.

As shown in Table 3, the projected Fiscal Year 2021-22 average total effective tax rate for completed single family detached homes conveyed to individual homeowners as of February 1, 2022 in the District range from approximately 1.66% to 1.86% of the base sales price of sample lots within the Ventana and Dorado neighborhoods of the District. The following table sets forth sample tax bills for selected completed homes owned by individual homeowners within the Ventana and Dorado neighborhoods of the District for Fiscal Year 2021-22.

TABLE 3
CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 54
(ESPERANZA FACILITIES)
SAMPLE TAX BILLS

Residential Floor Area (Sq. Ft.):		1,389	2,749
Type of Property:		Attached	Detached
Community Name:		Ventana	Dorado
Net Taxable Value			
Base Sales Price [1]		$ 519,700.00	$ 642,300.00
Less: Homeowner's Exemption		(7,000.00)	(7,000.00)
Net Taxable Value		$ 512,700.00	$ 635,300.00
***Ad Valorem* Property Taxes**	**Rate**		
Base Property Tax	1.0000%	$ 5,127.00	$ 6,353.00
Chaffey College Bond	0.0177	90.75	112.45
Chaffey High Bond	0.0371	190.21	235.70
Mountain View Elementary SFID #1	0.0156	79.98	99.11
Mountain View Elementary SFID #2	0.0459	235.33	291.60
Metro Water Mid-Valley Debt	0.0035	17.94	22.24
Total *Ad Valorem* Property Taxes	1.1198%	$ 5,741.21	$ 7,114.09
Parcel Charges, Assessments, and Special Taxes			
Vector Control Assessment #1		$ 21.52	$ 21.52
Metro Water - Water Standby		7.59	7.59
City of Ontario CFD No. 44 (Esperanza Services)[2]		1,352.92	1,560.77
City of Ontario CFD No. 54 (Esperanza Facilities)[3]		1,484.00	3,216.00
Total Parcel Charges, Assessments, and Special Taxes		$ 2,866.03	$ 4,805.88
Total Taxes		**$ 8,607.24**	**$ 11,919.97**
Total Effective Tax Rate		**1.66%**	**1.86%**

[1] Represents base sales prices for sample lots as reported in the Updated Price Point Study.
[2] Equal to the applicable Special Tax for CFD No. 44 for Fiscal Year 2021-22. The Maximum Special Tax for CFD No. 44 increases by up to 4% per year.
[3] Equal to the applicable Assigned Special Tax rate for the District. Reflects the final Assigned Special Tax rates. No reductions were required pursuant to Section C.1 of the Rate and Method.

Sources: San Bernardino County Tax Collector's Office; Price Point Consultant; Special Tax Consultant.

Property Values

Appraisal. In order to provide information with respect to the value of the land within the District, the District engaged the Appraiser to prepare the Appraisal. The principal of the Appraiser, who was actively involved in the preparation of the Appraisal, has an "MAI" designation from the Appraisal Institute and has prepared numerous appraisals for the sale of land secured municipal bonds. The Appraiser was selected by the District and has no material relationships with the City, the District or the owners of the land within the District other than the relationship represented by the engagement to prepare the Appraisal and other similar

engagements for the City. The City instructed the Appraiser to prepare its analysis and report in conformity with City-approved guidelines and the Appraisal Standards for Land Secured Financings published in 1994 and revised in 2004 by the commission now known as California Debt and Investment Advisory Commission. A copy of the Appraisal is included as APPENDIX B to this Official Statement.

The purpose of the Appraisal was to estimate the minimum market value of the fee simple estate, subject to special tax and special assessment liens, of the property within the District in its current condition. Subject to the contingencies, assumptions and limiting conditions set forth in the Appraisal, the Appraiser concluded that, as of February 1, 2022, the minimum market value of the property within the District was not less than $92,131,779 including $78,657,026 for the 100 completed units conveyed to individual homeowners, and $13,474,753 for the homes and lots owned by the Developer as of such date. See APPENDIX B — "APPRAISAL REPORT."

Reference is made to APPENDIX B for a complete list and full discussion of the applicable contingencies, assumptions and limiting conditions and the methodology employed by the Appraiser. In the event that any of the contingencies, assumptions and limiting conditions are not actually realized, the value of the property within the District may be less than the amount reported in the Appraisal. In any case, there can be no assurance that any portion of the property within the District would actually sell for the amount indicated by the Appraisal.

The Appraisal merely indicates the Appraiser's opinion as to the minimum market value of the property referred to therein as of the date and under the conditions specified therein. The Appraiser's opinion reflects conditions prevailing in the applicable market as of the date of value. The Appraiser's opinion does not predict the future value of the subject property, and there can be no assurance that market conditions will not further adversely change in the future. See "SPECIAL RISK FACTORS — COVID-19 (Coronavirus) Pandemic."

It is a condition precedent to the issuance of the Series 2022 Bonds that the Appraiser deliver to the District a certification to the effect that nothing has come to the attention of the Appraiser subsequent to the date of the Appraisal that would cause the Appraiser to believe that the value of property in the District is less than the minimum value reported in the Appraisal.

Value-to-Lien Ratios

The value of the property within the District is significant because, in the event of a delinquency in the payment of Special Taxes, the District may foreclose only against delinquent parcels. Likewise, the ratio of the value of a parcel to its "share" of the Series 2022 Bonds is important because it provides an indication of the extent of the relative burden imposed on each parcel by the applicable Special Tax. As indicated above, the minimum appraised value of the property within the District is not less than $92,131,779. The ratio of that value to the $6,110,000* total principal amount of the Series 2022 Bonds is approximately 15.08*-to-1. Taking other overlapping tax and assessment debt within the District into account, the ratio of the minimum appraised value to the total amount of existing tax and assessment debt for the District plus the Series 2022 Bonds of $7,097,475* is approximately 12.98*-to-1. See "— Direct and Overlapping Debt." Table 4 sets forth the appraised value-to-lien ratios of all the taxable property within the District by ownership and development status as of February 1, 2022.

Additionally, Table 5 below sets forth the stratification of value-to-liens of the parcels within the District, based on the appraised value of such parcels set forth in the Appraisal and such parcels' respective shares of the principal amount of the Series 2022 Bonds (allocated to each parcel based upon its respective share of the total projected Fiscal Year 2022-23 Special Tax levy) and the ratio of the appraised value to its share of the Series 2022 Bonds.

* *Preliminary, subject to change.*

TABLE 4
CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 54 (ESPERANZA FACILITIES)
APPRAISED VALUE-TO-LIEN RATIOS BY OWNERSHIP AND STATUS OF DEVELOPMENT

Owner	*Community Name*	*Status of Development* [1]	*No. of Planned Units*	*Projected Fiscal Year 2022-23 Special Tax Levy*[2]	*Percent of Projected Fiscal Year 2022-23 Special Tax Levy*	*Appraised Value* [3]	*District Debt*[4]*	*Average Appraised Value-to-Lien**
Individual Homeowners	Dorado	Completed and Sold	100	$ 323,725	69.46%	$ 78,657,026	$ 4,244,148	18.53
Esperanza PA 4 Venture	Ventana	Under Construction	3	$ 4,419	0.95	$ 320,827	$ 57,935	5.54
		Finished Lots	123	137,900	29.59	13,153,926	1,807,917	7.28
Subtotal - Esperanza PA 4 Venture			126	$ 142,319	30.54%	$ 13,474,753	$ 1,865,852	7.22
Grand Total			**226**	**$ 466,044**	**100.00%**	**$ 92,131,779**	**$ 6,110,000**	**15.08**

* *Preliminary, subject to change*.
(1) Construction status as provided in the Appraisal Report. May not reflect classification of properties for purposes of the Special Tax levy.
(2) Based on the building permits issued as of February 1, 2022 and assumes no further development. Includes the debt service due in 2023 on the Series 2022 Bonds and estimated Administrative Expenses in the amount of $89,244.
(3) Represents an allocation of the bulk market values reported in the Appraisal Report. The allocated values are not indicative of the market values of the groupings or the individual lots.
(4) Equal to the principal amount of the Series 2022 Bonds. Does not include overlapping debt secured by ad valorem taxes on the property. Allocated based on the proportionate share of the Projected Fiscal Year 2022-23 Special Tax levy.
Sources: Appraiser; Underwriter; Special Tax Consultant.

TABLE 5
CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 54
(ESPERANZA FACILITIES)
APPRAISED VALUE-TO-LIEN RATIOS

Appraised Value-to-Lien Category	*No. of Planned Units*	*Projected Fiscal Year 2022-23 Special Tax Levy[(1)]*	*Percent of Projected Fiscal Year 2022-23 Special Tax Levy*	*Appraised Value[(2)]*	*District Debt[(3)]**	*Average Appraised Value-to-Lien**
10:1 to 20:1	100	$ 323,725	69.46%	$ 78,657,026	$ 4,244,148	18.53
5:1 to 10:1	126	142,319	30.54	13,474,753	1,865,852	7.22
Total	**226**	**$ 466,044**	**100.00%**	**$ 92,131,779**	**$ 6,110,000**	**15.08**

* *Preliminary, subject to change*.

(1) Based on the building permits issued as of February 1, 2022 and assumes no further development. Includes the debt service due in 2023 on the Series 2022 Bonds and estimated Administrative Expenses in the amount of $89,244.

(2) Represents an allocation of the bulk market values reported in the Appraisal Report. The allocated values are not indicative of the market values of the groupings or the individual lots.

(3) Equal to the principal amount of the Series 2022 Bonds. Does not include overlapping debt secured by ad valorem taxes on property within the District. Allocated based on the proportionate share of the Projected Fiscal Year 2022-23 Special Tax levy.

Sources: Appraiser; Underwriter; Special Tax Consultant.

Delinquency History

The following table is a summary of Special Tax levies, collections and delinquency rates in the District beginning in Fiscal Year 2020-21, the first year of the Special Tax levy.

TABLE 6
CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 54
(ESPERANZA FACILITIES)
SPECIAL TAX LEVIES, DELINQUENCIES AND DELINQUENCY RATES

			As of the end of each Fiscal Year			*As of March 18, 2022*		
Fiscal Year	*Amount Levied*	*Parcels Levied*	*Parcels Delinquent*	*Amount Delinquent*	*Percent Delinquent*	*Parcels Delinquent*	*Amount Delinquent*	*Percent Delinquent*
2020-21	$ 58,263	18	0	$0	0.00%	0	$ 0	0.00%
2021-22[(1)]	291,040	90	N/A	N/A	N/A	5	7,853	5.40

(1) Delinquency information reflects the first installment only.

Sources: San Bernardino County Tax Collector's Office; Special; Tax Consultant.

PROPERTY OWNERSHIP AND THE DEVELOPMENT

The information provided in this section has been included because it may be considered relevant to an informed evaluation and analysis of the Series 2022 Bonds and the District. No assurance can be given, however, that the proposed development of the property within the District will occur in a timely manner or in the configuration or to the density described herein, or that the Developer, any owners or affiliates thereof, or any other property owner described herein will or will not retain ownership of its respective property within the District. There may be material adverse changes in this information after the date of this Official Statement. Neither the Series 2022 Bonds nor any of the Special Taxes are personal obligations of any property owner within the District and, in the event that any property owner defaults in the payment of its Special Taxes, the District may proceed with judicial foreclosure but has no direct recourse to the assets of any property owner or any affiliate thereof. The Series 2022 Bonds are secured solely by the Net Special Tax Revenues and amounts on deposit in certain of the funds and accounts maintained by the Trustee under the Indenture. See "SPECIAL RISK FACTORS" for a discussion of certain of the risk factors that should be considered in evaluating the investment quality of the Series 2022 Bonds. The following information regarding ownership and planned development of the District has been provided by the Developer. No representation is made by either the District or the Underwriter as to the accuracy or adequacy of such information so provided.

The Developer

The Developer is building and selling homes in the District within a neighborhood named "Ventana" and Esperanza PA 10 Venture previously built and sold homes in the District within a neighborhood named "Dorado." The Developer is ultimately managed by PLC Communities, Inc., a Delaware corporation ("PLC"). PLC is a residential home developer with over 30 completed developments in Orange, Los Angeles, Riverside, San Bernardino and San Diego Counties. PLC has been active in the Southern California market since 1996.

Information regarding PLC's operations in Southern California is available at www.plccommunities.com. *This Internet address is included for reference only, and the information on this Internet site is not a part of this Official Statement and is not incorporated by reference into this Official Statement. No representation is made in this Official Statement as to the accuracy or adequacy of the information contained on this Internet site*.

As of February 1, 2022, all 100 units of Dorado were sold and closed to individual homeowners, and the Developer owned 3 model homes under construction in Ventana and 123 finished lots/pads in Ventana. As of April 1, 2022, the Developer had completed and conveyed an additional __ residential units in Ventana to individual homeowners.

Development Plan

General Description of the District. The District is located in the southwestern portion of San Bernardino County, in the southern portion of the City, in an area known as "Ontario Ranch" (formerly known as New Model Colony). The District consists of two neighborhoods known as "Dorado" and "Ventana," respectively, which in total are expected to be developed into 226 single-family detached and attached dwellings. The Dorado site is generally bounded by Mill Creek Avenue to the west, Eucalyptus Avenue to the south, Amherst Avenue to the east and vacant lands to the north. The Dorado site consists of approximately 16.22 gross acres, all within Final Tract Map No. 17931. The Ventana site is generally bounded by Hamner Avenue to the east, Eucalyptus Avenue to the south, Clifton Street to the west and vacant lands to the north. The Ventana site consists of approximately 8.65 gross acres, all within Final Tract Map No. 20285. Esperanza is located within the Esperanza Specific Plan which at build-out is anticipated to include 1,410 dwelling units. Esperanza is part of a multiple phase, multiple master-planned community development known as "Ontario Ranch."

The Dorado neighborhood within the District consists of 100 detached single-family residential units, all of which have been conveyed to individual homeowners, in three floor plans ranging in size from approximately 2,510 square feet to approximately 2,960 square feet. The Dorado neighborhood is within Final Tract Map No. 17931. The Dorado neighborhood opened for sales in May 2020, and final build-out of the Dorado neighborhood occurred in the fourth quarter of 2021. As of February 1, 2022, all 100 of the single family detached residential units planned within the Dorado neighborhood had been completed and conveyed to individual homeowners. As of February 1, 2022, actual sales prices within the Dorado neighborhood ranged from approximately $552,145 to approximately $889,900.

The Developer is developing the Ventana neighborhood within the District into 126 attached single-family residential units in three floor plans ranging in size from approximately 1,216 square feet to approximately 1,628 square feet. The Ventana neighborhood is within Final Tract Map No. 20285. The Ventana neighborhood opened for sales in November 2021, and the Developer anticipates final build-out of the Ventana neighborhood in the fourth quarter of 2023. As of February 1, 2022, of the 126 single family attached residential units planned within the Ventana neighborhood, 3 model homes were under construction and owned by the Developer and 123 lots contained generally finished pads (15 of which were in escrow) and owned by the Developer. As of February 1, 2022, base sales within the Ventana neighborhood ranged from approximately $494,900 to approximately $574,900. Since February 1, 2022, as of April 1, 2022, __ residential units within the Ventana neighborhood had closed escrow to individual homeowners. As of April 1, 2022, the Developer owned __ model homes, __ completed production home, __ homes under construction and __ finished pads.

All of the backbone infrastructure required to serve the neighborhoods within the District has been completed and no discretionary approvals or remediation is necessary in order for the Developer to obtain the remaining 123 building permits in Ventana to be obtained within the District as of February 1, 2022. See the caption "THE COMMUNITY FACILITIES DISTRICT — General Information Regarding the District."

No assurance can be given that home construction and sales will be carried out on the schedule and according to the plans described herein, or that the home construction and sale plans or base prices set forth above will not change after the date of this Official Statement. Additionally, homes under contract to be sold may not result in closed escrows as sales contracts are subject to cancellation by the homebuyer. See "SPECIAL RISK FACTORS — Failure to Develop Properties."

COVID-19 Impact. The development of the Developer's planned development within the District is subject to disruption due to the COVID-19 pandemic and related public health and governmental authorities' orders and actions. With housing construction considered an essential function in the City, the Developer has largely continued, with certain modifications, their home construction and sales activities in the District to date. That is, the Developer has been able to sell, complete, obtain inspections for and close homes during such period, as applicable, and intend to continue its operations to the extent permitted. However, as of February 1, 2022, the Developer has experienced increases in certain construction costs, supply chain delays, work stoppages, reduced attendance of workers/labor shortages, delays in obtaining necessary inspections and approvals for homes, and increased cycle time for home deliveries, which may be attributed, directly or indirectly, to the COVID-19 pandemic. See "SPECIAL RISK FACTORS—COVID-19 (Coronavirus) Pandemic" herein.

The Developer cannot predict the ultimate effects of the COVID-19 outbreak and related public health and governmental authorities' orders and actions (including, without limitation, the scope of restrictions under potential Stay Home Orders), on their ability to sell and close units within the District. Such effects, if and as they arise, could have a material adverse effect on the ability to develop the District as planned, and no assurance can be provided that the Developer will be able to (a) complete in whole or in any part, or within any particular time, their planned development within the District; (b) avoid material increases in development costs or delays resulting from work stoppages, reduced attendance of workers, shortages or delays in the delivery of building materials, and/or delays in obtaining necessary inspections and approvals; or (c) close any

additional homes or not experience additional purchase contract cancellations, due to in each case public health or governmental restrictions, further spread of COVID-19, an economic downturn driven by the pandemic, or otherwise.

Financing Plan

The Dorado neighborhood has been fully-built out and sold. Esperanza PA 10 Venture used a combination of internal source, lot sales, and a commercial loan to finance the development of Dorado (which has been paid in full).

For Ventana, to date, the Developer has financed its land acquisition and various site development costs related to Ventana through internally generated funds, lot sales revenues and a revolving construction loan in the maximum amount of $10,000,000 from Zions Bancorporation, N.A. dba California Bank & Trust (the "CB&T Loan"). As of February 1, 2022, the CB&T Loan was outstanding in the amount of $4,049,514. The CB&T Loan is secured by a deed of trust on the Ventana property owned by the Developer in the District and matures on May 4, 2024, unless extended pursuant to the terms of the CB&T Loan. As homes close to individual homeowners, the lien of the deed of trust on such parcels will be released upon payment of the release price to CB&T.

The Developer estimates that as of February 1, 2022 it remains to incur approximately $38,100,000 in costs to complete its planned development within the District. The Developer expects to use lot sales revenues, internal funding, the CB&T Loan and reimbursement from Series 2022 Bond proceeds to complete its development in the District. The Developer believes that it will have sufficient funds available to complete its planned development in the District in accordance with the development schedule described in this Official Statement.

The following table shows the Developer's pro forma cash flow for its development within the District.

TABLE 7
CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 54
(ESPERANZA FACILITIES)
PRO-FORMA PROJECT CASH FLOW SUMMARY
AS OF APRIL 1, 2022

	Actuals Through April 1, 2022	*April 2022 - October 2022*	*November 2022 - April 2023*	*April 2023 - October 2023*	*April 2023 through Project Completion*	*Total*
Sources of Funds:						
Home Sales Revenue	$	$	$	$	$	$
Construction Loan Proceeds						
Equity Proceeds						
Estimated Bond Proceeds						
Total Sources of Funds	$	$	$	$	$	$
Uses of Funds:						
Engineering, Fees & Mapping	$	$	$	$	$	$
Site Development						
Home Construction						
Fees/Permits						
Field Expense						
Selling & Marketing						
Financial Other (Property Taxes)[(1)]						
Construction Loan Repayment						
Repayment of Equity						
Total Uses of Funds	$	$	$	$	$	$
Cumulative Net Cash Flow[(2)]	$	$	$	$	$	$

(1) Taxes include estimated Special Taxes.
(2) Excludes non-cash items, such as capitalized costs and accruals.
Source: The Developer.

Although the Developer expects to have sufficient funds available to complete its development in the District in accordance with the development schedule described in this Official Statement, there can be no assurance that amounts necessary to finance the remaining development costs will be available from the Developer or any other source when needed. Neither the Developer nor Esperanza PA 10 Venture, nor any of their related entities are under any legal obligation of any kind to expend funds for the development of and construction of homes within the District. Any contributions by the Developer to fund the costs of such development are entirely voluntary.

If and to the extent that internal funding, including but not limited to lot sales revenues, are inadequate to pay the costs to complete the planned development by the Developer within the District and other financing by the Developer is not put into place, there could be a shortfall in the funds required to complete the planned development by the Developer in the District.

SPECIAL RISK FACTORS

The principal source of payment of debt service on the Series 2022 Bonds will be payments of the Special Tax made with respect to the Taxable Property. As discussed under "SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2022 BONDS — Special Taxes," the Special Tax is to be levied annually against all such Taxable Property either at the maximum rate authorized by the Rate and Method or at such lower rates as are determined by the District Administrator to raise sufficient funds to comply with the agreements, conditions, covenants and terms contained in the Indenture, and in accordance with the Act. The

Special Tax is to be collected on the tax roll of the District at the same time and in the same manner as general *ad valorem* real property taxes are collected. The Special Tax cannot be levied at a tax rate higher than the maximum tax rate even if the maximum tax rate will not produce sufficient Net Special Tax Revenues to pay the principal and interest then payable with respect to the Series 2022 Bonds. See discussions below under "— Levy of the Special Tax" and "— Collection of the Special Tax."

Payment of the Special Tax levied on a parcel is secured by a continuing lien against such parcel. In the event an installment of the Special Tax included in the tax bill for a parcel of Taxable Property is not paid when due, the District has covenanted to institute foreclosure proceedings in court to cause the parcel to be sold in order to attempt to recover the delinquent amount from the sale proceeds. Foreclosure and sale may not always result in the recovery of the full amount of delinquent installments of the Special Tax. See "— Collection of the Special Tax." The sufficiency of the foreclosure sale proceeds to cover the delinquent amount depends in part upon the market for and the value of the parcel at the time of the sale. Sufficiency of the foreclosure sale proceeds to cover a delinquency may also depend upon the value of prior or parity liens and similar claims. Further, other governmental claims, such as hazardous substance claims, may affect the realizable value even though such claims may not rise to the status of liens. See "— Hazardous Substances."

Timely foreclosure and sale proceedings with respect to a parcel of Taxable Property may be forestalled or delayed by a stay in the event the owner of the parcel becomes the subject of bankruptcy proceedings. Not only may foreclosure and sale proceedings be forestalled or delayed, but the sale of a parcel may also be similarly affected by a bankruptcy stay. Further, should the stay not be lifted, payment of the Special Tax may be subordinated to bankruptcy law priorities. See "— Bankruptcy and Legal Delays."

Although bankruptcy proceedings may forestall or delay a foreclosure and sale or a tax sale of a delinquent parcel of Taxable Property, the Special Tax is secured by a lien which, assuming proper procedures are followed, may be enforced against the parcel. There may not be any recourse against a bankrupt property owner since the owner is not personally obligated to pay the Special Tax. Further, if proper disclosure of the authorization of the Special Tax is not made to the owner, the willingness or ability of an owner to pay the Special Tax may be adversely affected. See "— Payment of the Special Tax is Not a Personal Obligation of the Owners."

The District is not obligated to advance funds to pay such debt service except from moneys on deposit in the Reserve Fund. See "— Bonds Are Limited Obligations."

Even if debt service is timely paid, interest on the Series 2022 Bonds may have to be included in the gross income of the owner of the Series 2022 Bonds by reason of some circumstance occurring subsequent to issuance of the Series 2022 Bonds, thereby reducing the after-tax yield. See "— Loss of Tax Exemption."

Risks of Real Estate Secured Investments Generally – Declines in Value

Purchasers of the Series 2022 Bonds will be subject to the risks generally incident to an investment secured by real estate, including, without limitation, (i) adverse changes in local market conditions, such as changes in the market value of real property in the vicinity of the District, the supply of or demand for competitive properties in such area, and the market value of property in the event of sale or foreclosure; (ii) changes in real estate tax rates and other operating expenses, governmental rules and fiscal policies; and (iii) natural disasters (including, without limitation, earthquakes, wildfires and floods), which may result in uninsured losses.

No assurance can be given that the individual property owners within the District will pay Special Taxes in the future or that they will be able to pay such Special Taxes on a timely basis. See the caption "—Bankruptcy and Legal Delays" for a discussion of certain limitations on the District's ability to pursue judicial proceedings with respect to delinquent parcels within the District.

Levy of the Special Tax

The principal source of money with which to pay debt service on the Series 2022 Bonds is the proceeds derived from the annual levy and collection of the Special Tax applicable to the Taxable Property in the District. The amount of the Special Tax that can be levied is limited to the maximum tax rates authorized pursuant to the Rate and Method. Additionally, pursuant to Section 53321(d) of the Act, the Special Tax levied against any Assessor's parcel for which an occupancy permit for private residential use has been issued shall not be increased as a consequence of delinquency or default by the owner of any other Assessor's parcel within the District by more than ten percent above the amount that would have been levied in that fiscal year had there never been any such delinquencies or defaults. As a result, it is possible that the District may not be able to increase the tax levy to the Assigned Special Tax on residential parcels in all years. The levies cannot be made at higher rates even if the failure to do so would result in insufficient Net Special Tax Revenues to pay the principal of and interest on the Series 2022 Bonds as the same become due and payable.

The levy of the Special Tax will rarely, if ever, result in a uniform relationship between the value of a particular parcel and the amount of the levy of the Special Tax against such parcel. Thus, there will rarely, if ever, be a uniform relationship between the value of a parcel and its proportionate share of the debt service on the Series 2022 Bonds. The Special Tax levied in any particular Fiscal Year on a parcel is based upon the revenue needs of the District and the application of the Rate and Method. The application of the Rate and Method will, in turn, be dependent upon certain development factors with respect to each parcel by comparison with similar development factors with respect to the other parcels in the District. Thus, in addition to annual variations in the revenue needs of the District that must be met from the Special Tax, the following are some of the factors which might cause the levy of the Special Tax on any particular parcel to vary from the Special Tax that might otherwise be expected:

Reduction in the number of parcels of Taxable Property, for reasons such as acquisition of such parcels by a governmental entity and failure of the governmental entity to pay the Special Tax based upon a claim of exemption or, in the case of the federal government or an agency thereof, immunity from taxation, thereby resulting in an increased tax burden on the remaining parcels of Taxable Property; and

Failure of the owners of certain parcels of Taxable Property to pay the applicable Special Tax and delays in the collection of or inability to collect such Special Tax by tax sale or foreclosure and sale of the delinquent parcels, thereby resulting in an increased tax burden on the remaining parcels of Taxable Property.

Collection of the Special Tax

The timely payment of the principal of and interest on the Series 2022 Bonds is ultimately dependent upon the timely payment of all Special Taxes. Any money on deposit in the Reserve Fund can be used to make such payment in the event of delinquencies, but the replenishment of the Reserve Fund will be dependent on the recovery of such delinquencies. The Indenture provides that the Special Tax is to be collected in the same manner and at the same time and in the same installment as the general taxes on real property are payable (or in such other manner as the City Council shall determine, including direct billing of the affected property owners) and, except as provided in the special covenant for foreclosure described under the caption "SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2022 BONDS — Covenant for Superior Court Foreclosure" and in the Act, is to be subject to the same proportionate penalties and the same procedure, sale and lien priority in case of delinquency as is provided for *ad valorem* taxes on real property.

Pursuant to the Act, in the event of any delinquency in the payment of the Special Tax, the District may order the institution of a superior court action to foreclose the lien therefor within specified time limits. In such an action, the real property subject to the unpaid amount may be sold at judicial foreclosure sale. Such judicial foreclosure action is not mandatory. However, the District has covenanted for the benefit of the owners of the Series 2022 Bonds that it will institute foreclosure proceedings as authorized by the Act in order to enforce the lien of the delinquent installments of the Special Tax under certain circumstances. See

"SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2022 BONDS — Covenant for Superior Court Foreclosure." In the event that foreclosure proceedings are commenced, such foreclosure proceedings could be stayed by the commencement of bankruptcy proceedings by or against the owner of the property being foreclosed. In the event that sales or foreclosures of property are necessary, there could be a delay in payments to Owners of the Series 2022 Bonds pending such sales or the prosecution of foreclosure proceedings and receipt by the District of the proceeds of sale if the Reserve Fund is depleted.

The District may be unable to make full or timely payment of debt service on the Series 2022 Bonds if property owners in the District fail to pay installments of the Special Tax when due, if the Reserve Fund is depleted, or if the District is unable to sell foreclosed parcels for amounts sufficient to cover the delinquent installments of the Special Tax.

Failure to Develop Properties

Development of property within the District may be subject to unexpected delays, disruptions and changes which may affect the willingness and ability of the Developer or any other property owner to pay the Special Taxes prior to delinquency. Land development is subject to comprehensive federal, State and local regulations. Approval is required from various agencies in connection with the layout and design of developments, the nature and extent of improvements, construction activity, land use, zoning, school and health requirements, as well as numerous other matters. There is always the possibility that such approvals will not be obtained or, if obtained, will not be obtained on a timely basis. Failure to obtain any such agency approval or satisfy such governmental requirements would adversely affect planned land development. Development of land in the District is also subject to the availability of water. Finally, development of land is subject to economic considerations.

As of February 1, 2022, the District included 100 completed residential units which had closed escrow to individual homeowners (comprising the entirety of the Dorado neighborhood), 3 model units under construction and owned by the Developer, and 123 completed lots or building pads in a finished condition, __ of which were without building permits issued. (See "PROPERTY OWNERSHIP AND THE DEVELOPMENT." A detailed description of the status of the construction as of the date of value of the Appraisal is included in APPENDIX B — "APPRAISAL REPORT."

As of February 1, 2022, all of the property within the District had been rough-graded and all sewer, water, storm drains, streets, curbs and gutters were complete to serve all 226 homes planned within the District. See "THE COMMUNITY FACILITIES DISTRICT" and "PROPERTY OWNERSHIP AND THE DEVELOPMENT." However, no assurance can be given that the remaining planned residential development will be partially or fully completed; and for purposes of evaluating the investment quality of the Series 2022 Bonds, prospective purchasers should consider the possibility that such parcels will remain vacant and unimproved.

Undeveloped or partially developed land is inherently less valuable than developed land and provides less security to the Series 2022 Bond Owners should it be necessary for the District to foreclose on the property due to the nonpayment of Special Taxes. The failure to complete development in the District as planned, or substantial delays in the completion of the development may reduce the value of the property within the District and increase the length of time during which Special Taxes will be payable from undeveloped property, and may affect the willingness and ability of the owners of property within the District to pay the Special Taxes prior to delinquency.

There can be no assurance that land development operations within the District will not be adversely affected by a future deterioration of the real estate market and economic conditions or future local, State and federal governmental policies relating to real estate development, an increase in mortgage interest rates, the income tax treatment of real property ownership, or the national economy. A slowdown of the development process and the absorption rate could adversely affect land values and reduce the ability or desire of the

property owners to pay the annual Special Taxes. In that event, there could be a default in the payment of principal of, and interest on, the Series 2022 Bonds when due.

Series 2022 Bond Owners should assume that any event that significantly impacts the ability to develop land in the District would cause the property values within the District to decrease substantially from those estimated by the Appraiser and could affect the willingness and ability of the owners of land within the District to pay the Special Taxes prior to delinquency.

The payment of principal of and interest on the Series 2022 Bonds is dependent upon the receipt of Special Taxes levied on Developed Property, which includes lots in a finished lot condition. Lots in a finished lot condition also provide less security to the Series 2022 Bond Owners should it be necessary for the District to foreclose on such lot due to the nonpayment of the Special Taxes. Furthermore, an inability to develop the land within the District as currently planned will make the Series 2022 Bond Owners dependent upon timely payment of the Special Taxes levied on Developed Property, which includes lots in a finished lot condition. A slowdown or stoppage in the continued development of the District could reduce the willingness and ability of the Developer to make Special Tax payments on lots in a finished lot condition and could greatly reduce the value of such property in the event it has to be foreclosed upon.

Concentration of Property Ownership

Based on the ownership as of April 1, 2022, the Developer is projected to be responsible for approximately ____% of the total projected Fiscal Year 2022-23 Special Tax to be levied within the District. While the District includes completed homes owned by individual homeowners as of April 1, 2022, the inability or refusal of the Developer to pay the Special Tax applicable to its property when due could result in the depletion of the Reserve Fund prior to replenishment thereof from sale or foreclosure proceedings, and/or insufficient money with which to pay the principal of and interest on the Series 2022 Bonds as the same became due. Additionally, pursuant to the Act, the Special Taxes levied in any fiscal year against any parcel of residential property in the District may not be increased as a consequence of delinquency or default by the owners of any other parcels within the District by more than 10% above the amount that would have been levied in that fiscal year had there never been any such delinquencies or default. As a result, while the Maximum Special Taxes pursuant to the Rate and Method may be higher, Maximum Special Taxes on parcels of residential parcels cannot be greater than 110% of the projected actual Special Tax levy on such parcels.

Exempt Properties

Certain properties are exempt from the Special Tax in accordance with the Rate and Method. In addition, the Act provides that properties or entities of the State, federal or local government are exempt from the Special Tax; provided, however, that property in the District acquired by a public entity through a negotiated transaction or by gift or devise, which is not otherwise exempt from the Special Tax, will continue to be subject to the Special Tax. In addition, the Act provides that if property subject to the Special Tax is acquired by a public entity through eminent domain proceedings, the obligation to pay the Special Tax with respect to that property is to be treated as if it were a special assessment. The constitutionality and operation of these provisions of the Act have not been tested.

In particular, insofar as the Act requires payment of the Special Tax by a federal entity acquiring property in the District, it may be unconstitutional. If for any reason property in the District becomes exempt from taxation by reason of ownership by a nontaxable entity such as the federal government or another public agency, subject to the limitation of the maximum authorized rates, the Special Tax will be reallocated to the remaining Taxable Properties in the District. This would result in the owners of such property paying a greater amount of the Special Tax and could have an adverse impact upon the timely payment of the Special Tax. Moreover, if a substantial portion of property in the District becomes exempt from the Special Tax because of public ownership, or otherwise, the Maximum Annual Special Tax which could be levied upon the remaining

acreage might not be sufficient to pay principal of and interest on the Series 2022 Bonds when due and a default would occur with respect to the payment of such principal and interest.

Constitutional Limitations on Taxation and Appropriations

Articles XIIIA and XIIIB of the California Constitution. On June 6, 1978, California voters approved an amendment to the California Constitution, commonly known as Proposition 13 (the Jarvis/Gann Initiative), which added Article XIIIA to the California Constitution. The effect of Article XIIIA is to significantly limit the imposition of new *ad valorem* taxes, special taxes, transaction taxes, and sales taxes. On November 7, 1978, California voters approved Proposition 8, which made certain clarifications to Article XIIIA.

Article XIIIA of the California Constitution limits the amount of *ad valorem* taxes on real property to 1% of "full cash value" as determined by the county assessor. Article XIIIA defines "full cash value" to mean "the county assessor's valuation of real property as shown on the 1975-76 tax bill under 'full cash value' or, thereafter, the appraised value of real property when purchased, newly constructed, or a change in ownership has occurred after the 1975 assessment." The "full cash value" is subject to annual adjustment to reflect increases, not to exceed 2% per year, or decreases in the consumer price index or comparable local data, or to reflect reductions in property value caused by damage, destruction or other factors.

Article XIIIA exempts from the 1% tax limitation any taxes to repay indebtedness approved by the voters prior to July 1, 1978, and allows local governments to raise their property tax rates above the constitutionally mandated 1% ceiling for the purpose of paying off certain new general obligation debt issued for the acquisition or improvement of real property and approved by two-thirds of the votes cast by the qualified electorate. Article XIIIA requires a vote of two-thirds of the qualified electorate to impose special taxes on real property, while otherwise generally precluding the imposition of any additional *ad valorem* taxes, special taxes, transaction taxes, and sales taxes. In addition, Article XIIIA requires the approval of two-thirds of all members of the California Legislature to change any State laws resulting in increased tax revenues.

Enactment of Article XIIIA has reduced the amount of general property tax revenues received by the City. This reduction in such revenues makes it less likely that the City or the District will have surplus funds, other than the Reserve Fund for the Series 2022 Bonds, with which to advance funds to make any payments or to cure any deficiency in the Interest Account or Principal Account of the Special Tax Fund, should the City or the District, as applicable, in the exercise of its discretion, choose to do so. If there are additional delinquencies after exhaustion of funds in the Reserve Fund for the Series 2022 Bonds, none of the City or the District has any obligation to transfer into the Interest Account or Principal Account of the Special Tax Fund the amount of any such delinquencies out of any surplus moneys of the City.

On July 2, 1979, the Fifth District Court of Appeal rendered a 3-0 decision in the case of County of *Fresno v. Malmstrom* (94 Cal.App.3d 974), that determined that special assessments are not subject to the limitations of Article XIIIA (Proposition 13). The Court held the one percent tax limitation imposed by California Constitution Article XIIIA on *ad valorem* taxes does not apply to special assessments levied pursuant to the Improvement Act of 1911 (Streets and Highways Code, Section 5000 *et seq*., the relevant portions of which are incorporated in the 1915 Act) and the 1913 Act. The Court further held that because special assessments pursuant to such acts are not within the definition of "special taxes" in Article XIIIA, the Constitution does not require the levy of assessments and the issuance of bonds to be approved by a two-thirds vote of the qualified electors in an assessment district. On September 12, 1979, the California Supreme Court refused to hear an appeal of the lower court's decision.

At the November 6, 1979, general election, Proposition 4 (the Gann Initiative) was approved by the voters of California. Such proposition added Article XIIIB to the California Constitution.

Article XIIIB of the California Constitution limits the annual appropriations of the State and of any city, county, school district, authority, or other political subdivision of the State to the level of appropriations of the particular governmental entity for the prior fiscal year, as adjusted for changes in the cost of living, population and services rendered by the governmental entity. The "base year" for establishing such appropriation limit is the Fiscal Year 1978-79 and the limit is to be adjusted annually to reflect changes in population, consumer prices and certain increases in the cost of services provided by these public agencies.

Appropriations subject to Article XIIIB generally include the proceeds of taxes levied by the State or other entity of local government, exclusive of certain State subventions, refunds of taxes, benefit payments from retirement, unemployment insurance, and disability insurance funds. "Proceeds of taxes" include, but are not limited to, all tax revenues and the proceeds to an entity of government from (i) regulatory licenses, user charges, and user fees (but only to the extent such proceeds exceed the cost of providing the service or regulation), and (ii) the investment of tax revenues. Article XIIIB includes a requirement that if an entity's revenues in any year exceed the amounts permitted to be spent, the excess would have to be allocated to fund schools or be returned by revising tax rates or fee schedules over the subsequent two years.

On December 17, 1980, the Third District Court of Appeal rendered a 3-0 decision in the case *County of Placer v. Corin* (113 Cal. App. 3d 443) that determined that special assessments are not subject to the limitation of Article XIIIB (Proposition 4). The Court held that the definition of "proceeds of taxes" imposed by California Constitution Article XIIIB does not apply to special assessments and improvement bonds issued pursuant to the 1915 Act and the 1913 Act. The decision of the Court was not appealed.

The enactment of Article XIIIA of the California Constitution (Proposition 13) and subsequent legislative enactments effectively repeal the otherwise mandatory duty on the part of the City, under the 1915 Act, to levy and collect a special tax (in an amount necessary to meet delinquencies, but not to exceed ten cents on each $100 of assessable property within the City in any one year) if other funds are not available to cover delinquencies.

In early 1990, the U.S. Supreme Court struck down as a violation of equal protection certain property tax assessment practices in West Virginia, which had resulted in vastly different assessments of similar properties. Since Article XIIIA provides that property may only be assessed up to 2%, per year, except upon change of ownership or new construction, recent purchasers may pay substantially higher property taxes than long-time owners of comparable property in a community. The Supreme Court in the West Virginia case expressly declined to comment in any way on the constitutionality of Article XIIIA.

Based on this decision, however, property owners in California brought three suits challenging the acquisition value assessment provisions of Article XIIIA. Two cases involve residential property and one case involves commercial property. In all three cases, State trial and appellate courts have upheld the constitutionality of Article XIIIA's assessment rules and concluded that the West Virginia case did not apply to California's laws. On June 3, 1991, the U.S. Supreme Court agreed to hear the appeal in the challenge relating to commercial property, but the plaintiff subsequently decided to drop the case.

On October 7, 1991, the U.S. Supreme Court granted the plaintiff's petition for a writ of certiorari and agreed to hear the *Nordlinger v. Lynch* case. On June 18, 1992, the U.S. Supreme Court affirmed the Nordlinger decision (112 U.S. 2326) of the California Court of Appeal, Second Appellate District, which previously held that Article XIIIA does not violate the U.S. Constitution.

The City cannot predict whether any other pending or future challenges to the State's present system of property tax assessment will be successful, when the ultimate resolution of any challenge will occur, or the ultimate effect any decision regarding the State's present system of property tax assessment will have on the City's revenues or on the State's financial obligations to local governments.

Articles XIIIC and XIIID of the California Constitution. Proposition 218, a state ballot initiative known as the "Right to Vote on Taxes Act," was approved by California voters on November 6, 1996. Proposition 218 added Articles XIIIC and XIIID to the State Constitution, and, with the exception of certain provisions, Articles XIIIC and XIIID became effective on November 6, 1996.

Among other things, Proposition 218 imposed certain voting requirements and other limitations on the imposition of new or increased taxes, assessments, and property-related fees and charges. Under Proposition 218 (i) all taxes imposed by local governments are deemed to be either general taxes, or special taxes, (ii) no local government may impose, extend, or increase any general tax unless and until such tax is submitted to the electorate and approved by a majority vote, and (iii) no local government may impose, extend, or increase any special tax unless and until such tax is submitted to the electorate and approved by a two-thirds vote. Special purpose districts, including community facilities districts and assessment districts, have no power to levy general taxes. The City believes that the issuance of the Series 2022 Bonds does not require the conduct of further proceedings under the Mello-Roos Act, or Proposition 218, as applicable, other than as described herein.

Proposition 218 provides that the initiative power shall "not be prohibited or otherwise limited in matters reducing or repealing any local tax, assessment, fee or charge..." Thus, Proposition 218 removes limitations on the initiative power in matters of, among other things, the Special Taxes. Consequently, it is conceivable that the voters of the City or the District could, by future initiative, repeal, reduce, or prohibit the future imposition or increase of any Special Tax, subject to overriding federal constitutional principles relating to impairment of contracts.

Although the provisions of Article XIIIC have not been interpreted by the courts, the City believes that the initiative power cannot be used to reduce or repeal the unpaid Special Taxes that are pledged as security for payment of the Series 2022 Bonds or to otherwise interfere with the mandatory, statutory duty of the City and the County Auditor with respect to the unpaid Special Taxes that are pledged as security for payment of the Series 2022 Bonds.

The Appellate District, Division One, issued its opinion in 2014 in *City of San Diego v. Melvin Shapiro, et al*. (228 Cal. App. 4th 756) (the "San Diego Decision"). The case involved a Convention Center Facilities District (the "CCFD") established by the City of San Diego. The CCFD is a financing district much like a community facilities district established under the provisions of the Act. The CCFD is comprised of all of the real property in the entire City of San Diego. However, the special tax to be levied within the CCFD was to be levied only on hotel properties located within the CCFD.

The election authorizing the special tax was limited to owners of hotel properties and lessees of real property owned by a governmental entity on which a hotel is located. Thus, the election was not a registered voter election. Such approach to determining who would constitute the qualified electors of the CCFD was modeled after Section 53326(c) of the Act, which generally provides that, if a special tax will not be apportioned in any tax year on residential property, the legislative body may provide that the vote shall be by the landowners of the proposed district whose property would be subject to the special tax. The Court held that the CCFD special tax election was invalid under the California Constitution because Article XIIIA, Section 4 thereof and Article XIIIC, Section 2 thereof require that the electors in such an election be the registered voters within the district.

The facts of the San Diego Decision show that there were hundreds of thousands of registered voters within the CCFD (viz., all of the registered voters in the City of San Diego). There were no registered voters in the District at the time of formation. In the San Diego Decision, the Court expressly stated that it was not addressing the validity of landowner voting to impose special taxes pursuant to the Act in situations where there are fewer than 12 registered voters. Thus, by its terms, the Court's holding does not apply to the Special Tax elections in the District. Moreover, Section 53341 of the Act provides that any "action or proceeding to attack, review, set aside, void or annul the levy of a special tax…shall be commenced within 30 days after the

special tax is approved by the voters." Similarly, Section 53359 of the Act provides that any action to determine the validity of bonds issued pursuant to the Act be brought within 30 days of the voters approving the issuance of such bonds. On May 19, 2020, Esperanza PA 4 Venture and Esperanza PA 10 Venture, the qualified voters within the District at the time of the election, approved the Special Tax and the issuance of bonds. Based on Sections 53341 and 53359 of the Act and analysis of existing laws, regulations, rulings and court decisions, the City believes the Special Tax is being levied in accordance with the Rate and Method.

The interpretation and application of Proposition 218 will ultimately be determined by the courts with respect to a number of the matters discussed above, and it is not possible at this time to predict with certainty the outcome of such determination.

Maximum Special Tax

Within the limits of the Special Tax, the District may adjust the Special Tax levied on all property in the District to provide an amount required to pay interest on and principal of the Series 2022 Bonds, and the amount, if any, necessary to cure delinquencies and replenish the Reserve Fund to an amount equal to the Reserve Requirement for the respective Bonds and to pay Administrative Expenses. However, the amount of the Special Tax that may be levied against any property in the District is subject to the Maximum Special Tax applicable to it. There is no assurance that the Maximum Special Tax on the property in the District will be sufficient to pay the amounts required to be paid by the Indenture at all times. Additionally, pursuant to the Act, the Special Taxes levied in any fiscal year against any parcel of residential property in the District may not be increased as a consequence of delinquency or default by the owners of any other parcels within the District by more than 10% above the amount that would have been levied in that fiscal year had there never been any such delinquencies or defaults. See "SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2022 BONDS — Special Taxes."

Payment of the Special Tax is Not a Personal Obligation of the Owners

An owner of a parcel of Taxable Property is not personally obligated to pay the Special Tax. Rather, the Special Tax is an obligation only against the parcel of Taxable Property. If the value of a parcel is not sufficient, taking into account other obligations also payable thereby, to fully secure the Special Tax, the District has no recourse against the owner.

Disclosures to Future Purchasers

The District has recorded a notice of the Special Tax lien in the Office of the County Recorder. While title companies normally refer to such notices in title reports, there can be no guarantee that such reference will be made or, if made, that a prospective purchaser or lender will consider such Special Tax obligation in the purchase of a parcel of land, a home or a commercial or industrial facility in the District or the lending of money thereon. The Act requires the subdivider (or its agent or representative) of a subdivision to notify a prospective purchaser or long-term lessor of any lot, parcel, or unit subject to a Mello–Roos special tax of the existence and maximum amount of such special tax using a statutorily prescribed form. California Civil Code Section 1102.6b requires that in the case of transfers other than those covered by the above requirement, the seller must at least make a good faith effort to notify the prospective purchaser of the special tax lien in a format prescribed by statute. Failure by an owner of the property to comply with the above requirements, or failure by a purchaser or lessor to consider or understand the nature and existence of the Special Tax, could adversely affect the willingness and ability of the purchaser or lessor to pay the Special Tax when due.

Parity Taxes and Special Assessments

The ability or willingness of a property owner in the District to pay the Special Tax could be affected by the existence of other taxes and assessments imposed upon the property. The Special Tax and any penalties thereon will constitute a lien against the lots and parcels of land on which they will be annually imposed until

they are paid. Such lien is on a parity with all special tax and special assessments levied by other agencies and is co-equal to and independent of the lien for general property taxes, other special taxes, and certain special assessments regardless of when they are imposed upon the same property. The Special Tax has priority over all existing and future private liens imposed on the property. In addition, other public agencies whose boundaries overlap those of the District could, with or in some circumstances without the consent of the owners of the land in the District, impose additional taxes or assessment liens on the property in the District in order to finance public improvements to be located inside or outside of the District.

The District has no control over the ability of other entities and districts to issue indebtedness secured by special tax or assessments payable from all or a portion of the property in the District. In addition, the City is not prohibited itself from establishing assessment districts, community facilities districts or other districts which might impose assessments or taxes against property in the District. In the event any additional improvements are financed pursuant to the establishment of an assessment district, community facilities district or other district, any taxes or assessments levied to finance such improvements will have a lien on a parity with the lien of the Special Tax. The imposition of additional liens on a parity with the Special Tax could reduce the ability or willingness of the property owners to pay the Special Tax and increase the possibility that foreclosure proceeds will not be adequate to pay delinquent Special Tax or the principal of and interest on the Series 2022 Bonds when due.

Depletion of Reserve Fund

The Reserve Fund is to be maintained at an amount equal to the Reserve Requirement. Money in said fund may be used to pay debt service on the Series 2022 Bonds in the event the proceeds of the levy and collection of the Special Tax against property in the District are insufficient. If funds in the Reserve Fund are used to pay debt service on the Series 2022 Bonds, the funds can be replenished from the proceeds of the levy and collection of the Special Tax that are in excess of the amount required to pay all amounts to be paid pursuant to the Indenture. However, no replenishment from the proceeds of a levy of the Special Tax can occur as long as the proceeds that are collected from the levy of the Special Tax at the maximum tax rates, together with other available funds, remain insufficient to pay all such amounts. Thus it is possible that the Reserve Fund will be depleted by its use to pay such amounts and will not be replenished by the levy of the Special Tax. There is no assurance that the amount in the Reserve Fund will, at any particular time, be sufficient to pay all such amounts or that any amounts of the Reserve Requirement used for debt service on the Series 2022 Bonds will be fully replenished from the proceeds of the levy and collection of the Special Tax.

Bankruptcy and Legal Delays

The payment of the Special Tax and the ability of the District to foreclose the lien of a delinquent unpaid tax, as discussed in "SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2022 BONDS," may be limited by bankruptcy, insolvency or other laws generally affecting creditors' rights or by the laws of the State of California relating to judicial foreclosure. In addition, the prosecution of a foreclosure action could be delayed due to crowded local court calendars or delays in the legal process. The various legal opinions to be delivered concurrently with the delivery of the Series 2022 Bonds (including Bond Counsel's approving legal opinion) will be qualified as to the enforceability of the various legal instruments by bankruptcy, insolvency, reorganization, moratorium and other similar laws affecting creditors' rights, by the application of equitable principles and by the exercise of judicial discretion in appropriate cases.

Although bankruptcy proceedings would not cause the obligation to pay the Special Tax to become extinguished, the bankruptcy of a property owner could result in a delay in prosecuting superior court foreclosure proceedings because federal bankruptcy laws may provide for an automatic stay of foreclosure and sale of tax sale proceedings. Any such delays could increase the likelihood of a delay or default in payment of the principal of and interest on the Series 2022 Bonds and the possibility of delinquent tax installments not being paid in full. Moreover, if the value of the subject property is less than the lien of the Special Tax, such excess could be treated as an unsecured claim by the bankruptcy court. Further, should remedies be exercised

under the federal bankruptcy laws against Taxable Property, payment of the Special Tax may be subordinated to bankruptcy law priorities. Thus, certain claims may have priority over the Special Tax in a bankruptcy proceeding even though they would not outside of a bankruptcy proceeding.

FDIC/Federal Government Interests In Properties

The ability of the District to collect interest and penalties specified by the Act and to foreclose the lien of delinquent Special Taxes may be limited in certain respects with regard to parcels in which the Federal Deposit Insurance Corporation (the "FDIC"), or other federal government entities such as Fannie Mae or Freddie Mac, has or obtains an interest.

In the case of the FDIC, in the event that any financial institution making a loan which is secured by parcels is taken over by the FDIC and the applicable Special Tax is not paid, the remedies available to the District may be constrained. The FDIC's policy statement regarding the payment of state and local real property taxes (the "Policy Statement") provides that taxes other than *ad valorem* taxes which are secured by a valid lien in effect before the FDIC acquired an interest in a property will be paid unless the FDIC determines that abandonment of its interests is appropriate. The Policy Statement provides that the FDIC generally will not pay installments of non-*ad valorem* taxes which are levied after the time the FDIC acquires its fee interest, nor will the FDIC recognize the validity of any lien to secure payment except in certain cases where the Resolution Trust Corporation had an interest in property on or prior to December 31, 1995. Moreover, the Policy Statement provides that, with respect to parcels on which the FDIC holds a mortgage lien, the FDIC will not permit its lien to be foreclosed out by a taxing authority without its specific consent, nor will the FDIC pay or recognize liens for any penalties, fines or similar claims imposed for the nonpayment of taxes.

The FDIC has taken a position similar to that expressed in the Policy Statement in legal proceedings brought against Orange County, California, in United States Bankruptcy Court and in Federal District Court. The Bankruptcy Court issued a ruling in favor of the FDIC on certain of such claims. Orange County appealed that ruling, and the FDIC cross-appealed. On August 28, 2001, the Ninth Circuit Court of Appeals issued a ruling favorable to the FDIC except with respect to the payment of pre-receivership liens based upon delinquent property tax.

The District is unable to predict what effect the application of the Policy Statement would have in the event of a delinquency with respect to parcels in which the FDIC has or obtains an interest, although prohibiting the lien of the FDIC to be foreclosed out at a judicial foreclosure sale would prevent or delay the foreclosure sale.

In the case of Fannie Mae and Freddie Mac, in the event a parcel of Taxable Property is owned by a federal government entity or federal government sponsored entity, such as Fannie Mae or Freddie Mac, or in the event a private deed of trust secured by a parcel of Taxable Property is owned by a federal government entity or federal government sponsored entity, such as Fannie Mae or Freddie Mac, the ability to foreclose on the parcel or to collect delinquent Special Taxes may be limited. Federal courts have held that, based on the supremacy clause of the United States Constitution, in the absence of Congressional intent to the contrary, a state or local agency cannot foreclose to collect delinquent taxes or assessments if foreclosure would impair the federal government interest. This means that, unless Congress has otherwise provided, if a federal government entity owns a parcel of Taxable Property but does not pay taxes and assessments levied on the parcel (including Special Taxes), the applicable state and local governments cannot foreclose on the parcel to collect the delinquent taxes and assessments.

Moreover, unless Congress has otherwise provided, if the federal government has a mortgage interest in the parcel and the District wishes to foreclose on the parcel as a result of delinquent Special Taxes, the property cannot be sold at a foreclosure sale unless it can be sold for an amount sufficient to pay delinquent taxes and assessments on a parity with the Special Taxes and preserve the federal government's mortgage interest.

The District's remedies may also be limited in the case of delinquent Special Taxes with respect to parcels in which other federal agencies (such as the Internal Revenue Service and the Drug Enforcement Administration) have or obtain an interest.

Geologic, Topographic and Climatic Conditions

The District, like all California communities, may be subject to unpredictable seismic activity, fires, flood, or other natural disasters. Southern California is a seismically active area. Seismic activity represents a potential risk for damage to buildings, roads, bridges and property within the District. In addition, land susceptible to seismic activity may be subject to liquefaction during the occurrence of such event. The District is not located within an identified earthquake study zone.

No known active earthquake faults cross the District and the nearest active earthquake fault to the District is the Chino-Central Avenue fault, located approximately 5 miles to the west of the District. Other known regional active faults that could affect the site include the Whittier, Elsinore-Glen Ivy, San Jose, Cucamonga, Sierra Madre, San Jacinto-San Bernardino segment, Puente Hills and San Andreas faults.

The Federal Emergency Management Agency has determined that the District is located in a Zone "X" flood area (an area of minimal flooding, within the 500-year flood plain), and flood insurance will not be required. The area is protected by a levee.

In recent years, portions of Southern California have experienced wildfires that have burned thousands of acres and destroyed thousands of homes and structures, even in areas not previously thought to be prone to wildfires. While the District is not aware of any particular risk of wildfire within the District, there can be no assurances that wildfires won't occur within the District. Property damage due to wildfire could result in a significant decrease in the market value of property in District and in the ability or willingness of property owners to pay Special Taxes when due.

In the event of a severe earthquake, fire, flood or other natural disaster, there may be significant damage to both property and infrastructure in the District. As a result, a substantial portion of the property owners may be unable or unwilling to pay the Special Taxes when due. In addition, the value of land in the District could be diminished in the aftermath of such a natural disaster, reducing the resulting proceeds of foreclosure sales in the event of delinquencies in the payment of the Special Taxes.

Methane Gas

Like much of the property within the City and surrounding areas, the property within the District has previously been utilized as dairy pastures and agricultural fields. An updated Methane Gas Investigation Report for certain tract maps, including Tract Map Nos. 17931 and 20285 covering the Dorado and Ventana neighborhoods, respectively, was prepared by LGC Geo-Environmental, Inc. dated January 14, 2020 (the "Methane Investigation"). The Methane Investigation identified that the Dorado and Ventana neighborhoods were outside the methane study area and that methane gas on the Dorado and Ventana neighborhoods was either not detected or less than the level that requires any type of remediation. No additional methane investigations were recommended.

Hazardous Substances

While governmental taxes, assessments, and charges are a common claim against the value of a parcel of Taxable Property, other less common claims may be relevant. One example is a claim with regard to a hazardous substance.

In general, the owners and operators of a parcel of Taxable Property may be required by law to remedy conditions of the parcel relating to releases or threatened releases of hazardous substances. The federal

Comprehensive Environmental Response, Compensation and Liability Act of 1980, sometimes referred to as "CERCLA" or the "Superfund Act," is the most well-known and widely applicable of these laws, but California laws with regard to hazardous substances are also stringent and similar. Under many of these laws, the owner (or operator) is obligated to remedy a hazardous substance condition of property whether or not the owner (or operator) has anything to do with creating or handling the hazardous substance. The effect, therefore, should any of the Taxable Property be affected by a hazardous substance is to reduce the marketability and value of the parcel by the costs of remedying the condition, because the purchaser, upon becoming owner, will become obligated to remedy the condition just as is the seller. Further, such liabilities may arise not simply from the existence of a hazardous substance but from the method of handling it. All of these possibilities could significantly affect the value of the property that is realizable upon a delinquency and foreclosure.

While the District is not aware that the owner (or operator) of any of Taxable Property has such a current liability with respect to any of the Taxable Property, it is possible that such liabilities do currently exist and that the District is not aware of them. The Developer has also represented to the District that they are not aware of any federally or State classified hazardous substances located on their property within the District.

Further, it is possible that liabilities may arise in the future with respect to any of the Taxable Property resulting from the existence, currently, on the parcel of a substance presently classified as hazardous but which has not been released or the release of which is not presently threatened, or may arise in the future resulting from the existence, currently, on the parcel of a substance not presently classified as hazardous but which may in the future be so classified. Further, such liabilities may arise not simply from the existence of a hazardous substance but from the method of handling it. All of these possibilities could significantly affect the value of a parcel of Taxable Property that is realizable upon a delinquency.

No Acceleration Provision

The Indenture does not contain a provision allowing for the acceleration of the Series 2022 Bonds in the event of a payment default or other default under the terms of the Series 2022 Bonds or the Indenture.

Bonds Are Limited Obligations

Neither the faith and credit nor the taxing power of the District (except to the limited extent set forth in the Indenture), the City, the State, or any political subdivision thereof, is pledged to the payment of the Series 2022 Bonds. The Series 2022 Bonds are limited obligations of the District; and, except as provided in the Indenture, they are payable solely from Net Special Tax Revenues and the other assets pledged therefor under the Indenture. Net Special Tax Revenues could be insufficient to pay debt service on the Series 2022 Bonds as a result of delinquencies in the payment of Special Taxes or the insufficiency of proceeds derived from the sale of land within the District following a delinquency in the payment of the applicable Special Tax. Neither the City nor the District has any obligation to pay debt service on the Series 2022 Bonds in the event of insufficient Net Special Tax Revenues, except to the extent that money is available for such purpose in the Reserve Fund. The District's only obligation with respect to delinquent Special Taxes is to pursue judicial foreclosure proceedings under the circumstances described in the Indenture. See "SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2022 BONDS — Covenant for Superior Court Foreclosure."

Loss of Tax Exemption

As discussed under "TAX MATTERS," interest on the Series 2022 Bonds could become includable in gross income for purposes of federal income taxation retroactive to the date of issuance, as a result of acts or omissions of the District subsequent to the issuance of the Series 2022 Bonds in violation of the District's covenants with respect to the Series 2022 Bonds. Should interest become includable in gross income, the Series 2022 Bonds are not subject to redemption by reason thereof and will remain outstanding until maturity

or unless earlier redeemed pursuant to optional or mandatory redemption or redemption upon prepayment of the Special Tax.

Potential Early Redemption of Bonds from Special Tax Prepayments

Property owners within the District are permitted to prepay their Special Taxes at any time. Such payments will result in a mandatory redemption of Series 2022 Bonds from Special Tax prepayments on the Interest Payment Date for which timely notice may be given under the Indenture following the receipt of such Special Tax prepayment. The resulting redemption of Series 2022 Bonds purchased at a price greater than par could reduce the otherwise expected yield on such Series 2022 Bonds. See "THE SERIES 2022 BONDS — Redemption — *Mandatory Redemption from Special Tax Prepayments*."

No Teeter Plan

Although the San Bernardino County Board of Supervisors has adopted the Alternative Method of Distribution of Tax Levies and Collections and of Tax Sale Proceeds (the "Teeter Plan") which allows each entity levying secured property taxes in the County to draw on the amount of property taxes levied rather than the amount actually collected, as provided for in Section 4701 *et seq*. of the California Revenue and Taxation Code, the District is not included in the Teeter Plan. Consequently, the District may not draw on the County Tax Loss Reserve Fund in the event of delinquencies in Special Tax payments.

COVID-19 (Coronavirus) Pandemic

The spread of the novel strain of coronavirus called COVID-19 ("COVID-19") is having significant negative impacts throughout the world, including in the City. Since mid-March 2020, based on guidance and directives from the State and public health agencies, the City and the State have undergone varying degrees of closure and limited reopening of public buildings and businesses. There have been confirmed cases of COVID-19 in the City, and confirmed cases of COVID-19 are growing throughout the State and health officials are expecting the number of confirmed cases to continue to grow.

The COVID-19 pandemic is ongoing, and the ultimate geographic spread of the virus, the duration and severity of the outbreak, and the economic and other actions that may be taken by governmental authorities to contain the outbreak or to treat its impacts are uncertain. However, the impact of the COVID-19 outbreak could adversely impact development within the District, including, but not limited to, one or more of the following ways: (i) potential supply chain slowdowns or shutdowns resulting from the unavailability of workers in locations producing construction materials; (ii) slowdowns or shutdowns by local governmental agencies in providing governmental permits, inspections, title and document recordation, and other services and activities associated with real estate development; (iii) delays in construction where one or more members of the workforce becomes infected with COVID-19; (iv) continued extreme fluctuations in financial markets and contraction in available liquidity; (v) extensive job losses and declines in business activity across important sectors of the economy; (vi) declines in business and consumer confidence that negatively impact economic conditions or cause an economic recession; (vii) the failure of government measures to stabilize the financial sector and introduce fiscal stimulus to counteract the economic impact of the pandemic; (viii) delays in sales or fewer sales due to lower traffic at model home complexes and real estate offices; and (ix) delays in sales, or cancellations, due to mortgage lending issues. The ultimate adverse impact of COVID-19 on the District, the Developer's operations, finances and ability to complete its developments within the District as planned, homebuyers' willingness and ability to pay Special Taxes when due, and the real estate market in general is unknown. See "PROPERTY OWNERSHIP AND THE DEVELOPMENT — Development Plan — *COVID-19 Impact*."

CONTINUING DISCLOSURE

District Continuing Disclosure Agreement

Pursuant to the District Continuing Disclosure Agreement, the District has agreed to provide, or cause to be provided, to the Electronic Municipal Market Access System of the Municipal Securities Rulemaking Board, which can be found on the Internet at *www.emma.msrb.org* ("EMMA") on an annual basis, commencing April 1, 2023, certain financial information and operating data concerning the District. The District has further agreed to provide notice to EMMA of certain listed events. The District's covenants have been made in order to assist the Underwriter in complying with Rule 15c2-12 adopted by the Securities and Exchange Commission.

The District has not previously entered into any undertaking with respect to Rule 15c2-12. However, the City and its related governmental entities (the "City Entities") for whom City staff is responsible for undertaking compliance with continuing disclosure undertakings have previously entered into numerous disclosure undertakings under the Rule 15c2-12 in connection with the issuance of long-term obligations.

In order to ensure ongoing compliance with its continuing disclosure undertakings, the City has designated staff members within the Investments & Revenue Resources Department with the responsibility of ensuring timely and complete filings. In addition, the City has retained an outside consultant to conduct periodic reviews of City compliance.

Within the last five years, the City and the City Entities have not failed to timely comply with their respective prior continuing disclosure obligations under Rule 15c2-12 in all material respects. The full text of the form of the District Continuing Disclosure Agreement is set forth in APPENDIX G.

Developer Continuing Disclosure Agreement

Although the Underwriter has concluded that the Developer is not an obligated person under Rule 15c2-12, pursuant to the Developer Continuing Disclosure Agreement, the Developer has agreed to provide, or cause to be provided, to EMMA, on a semi-annual basis certain information concerning the Developer and its property ownership and development within the District. The Developer has further agreed to provide notice to EMMA of certain listed events. The Developer's obligation to provide semi-annual reports and notices of certain listed events will terminate upon the earlier to occur of certain events, including at such time as at least 101 of the planned 126 Ventana residential units within the District have been conveyed to homebuyers. A default under the Developer Continuing Disclosure Agreement will not, in itself, constitute an Event of Default under the Indenture, and the sole remedy under the Developer Continuing Disclosure Agreement in the event of any failure of the Developer or the dissemination agent, as applicable, to comply with the Developer Continuing Disclosure Agreement will be an action to compel performance. See APPENDIX H — "FORM OF DEVELOPER CONTINUING DISCLOSURE AGREEMENT" for a description of the specific nature of the semi-annual reports to be filed by the Developer and notices of listed events to be provided by the Developer.

Neither the District nor the City has considered, or reached any conclusion as to, whether or not the Developer is an obligated person under Rule 15c2-12 and takes no responsibility for any such conclusion. Additionally, neither the District nor the City has participated in the preparation, negotiation or implementation of the Developer Continuing Disclosure Agreement or in discussions regarding the form or content thereof. The District and the City take no responsibility for such form or content or for the adequacy of the Developer Continuing Disclosure Agreement for its intended purpose.

None of the District, the City or the Trustee is a party to the Developer Continuing Disclosure Agreement, and none of the District, the City or the Trustee has any obligation or responsibility to monitor, nor any right or obligation to enforce, compliance by the Developer with the undertakings pursuant to the

Developer Continuing Disclosure Agreement, and none of the District, the City or the Trustee will be so monitoring or enforcing such compliance.

Developer's Prior Disclosure Compliance. This is the first continuing disclosure undertaking by the Developer. PLC, as the manager of the Developer, has not failed in any material respect to comply with any previous undertaking by it to provide periodic continuing disclosure reports or notices of material events with respect to community facilities districts or assessment districts in Southern California within the past five years.

TAX MATTERS

In the opinion of Orrick, Herrington & Sutcliffe LLP, Bond Counsel to the District ("Bond Counsel"), based upon an analysis of existing laws, regulations, rulings and court decisions, and assuming, among other matters, the accuracy of certain representations and compliance with certain covenants, interest on the Series 2022 Bonds is excluded from gross income for federal income tax purposes under Section 103 of the Internal Revenue Code of 1986 (the "Code") and is exempt from State of California personal income taxes. Bond Counsel is of the further opinion that interest on the Series 2022 Bonds is not a specific preference item for purposes of the federal alternative minimum tax. Bond Counsel expresses no opinion regarding any other tax consequences related to the ownership or disposition of, or the amount, accrual or receipt of interest on, the Series 2022 Bonds. A complete copy of the proposed form of opinion of Bond Counsel is set forth in APPENDIX D hereto.

To the extent the issue price of any maturity of the Series 2022 Bonds is less than the amount to be paid at maturity of such Series 2022 Bonds (excluding amounts stated to be interest and payable at least annually over the term of such Series 2022 Bonds), the difference constitutes "original issue discount," the accrual of which, to the extent properly allocable to each Beneficial Owner thereof, is treated as interest on the Series 2022 Bonds which is excluded from gross income for federal income tax purposes and exempt from State of California personal income taxes. For this purpose, the issue price of a particular maturity of the Series 2022 Bonds is the first price at which a substantial amount of such maturity of the Series 2022 Bonds is sold to the public (excluding bond houses, brokers, or similar persons or organizations acting in the capacity of underwriters, placement agents or wholesalers). The original issue discount with respect to any maturity of the Series 2022 Bonds accrues daily over the term to maturity of such Series 2022 Bonds on the basis of a constant interest rate compounded semiannually (with straight-line interpolations between compounding dates). The accruing original issue discount is added to the adjusted basis of such Series 2022 Bonds to determine taxable gain or loss upon disposition (including sale, redemption, or payment on maturity) of such Series 2022 Bonds. Beneficial Owners of the Series 2022 Bonds should consult their own tax advisors with respect to the tax consequences of ownership of Series 2022 Bonds with original issue discount, including the treatment of Beneficial Owners who do not purchase such Series 2022 Bonds in the original offering to the public at the first price at which a substantial amount of such Series 2022 Bonds is sold to the public.

Series 2022 Bonds purchased, whether at original issuance or otherwise, for an amount higher than their principal amount payable at maturity (or, in some cases, at their earlier call date) ("Premium Series 2022 Bonds") will be treated as having amortizable bond premium. No deduction is allowable for the amortizable bond premium in the case of bonds, like the Premium Series 2022 Bonds, the interest on which is excluded from gross income for federal income tax purposes. However, the amount of tax-exempt interest received, and a Beneficial Owner's basis in a Premium Series 2022 Bond, will be reduced by the amount of amortizable bond premium properly allocable to such Beneficial Owner. Beneficial Owners of Premium Series 2022 Bonds should consult their own tax advisors with respect to the proper treatment of amortizable bond premium in their particular circumstances.

The Code imposes various restrictions, conditions and requirements relating to the exclusion from gross income for federal income tax purposes of interest on obligations such as the Series 2022 Bonds. The District has made certain representations and covenanted to comply with certain restrictions, conditions and

requirements designed to ensure that interest on the Series 2022 Bonds will not be included in federal gross income. Inaccuracy of these representations or failure to comply with these covenants may result in interest on the Series 2022 Bonds being included in gross income for federal income tax purposes, possibly from the date of original issuance of the Series 2022 Bonds. The opinion of Bond Counsel assumes the accuracy of these representations and compliance with these covenants. Bond Counsel has not undertaken to determine (or to inform any person) whether any actions taken (or not taken), or events occurring (or not occurring), or any other matters coming to Bond Counsel's attention after the date of issuance of the Series 2022 Bonds may adversely affect the value of, or the tax status of interest on, the Series 2022 Bonds. Accordingly, the opinion of Bond Counsel is not intended to, and may not, be relied upon in connection with any such actions, events or matters.

Although Bond Counsel is of the opinion that interest on the Series 2022 Bonds is excluded from gross income for federal income tax purposes and is exempt from State of California personal income taxes, the ownership or disposition of, or the accrual or receipt of amounts treated as interest on, the Series 2022 Bonds may otherwise affect a Beneficial Owner's federal, state or local tax liability. The nature and extent of these other tax consequences depends upon the particular tax status of the Beneficial Owner or the Beneficial Owner's other items of income or deduction. Bond Counsel expresses no opinion regarding any such other tax consequences.

Current and future legislative proposals, if enacted into law, clarification of the Code or court decisions may cause interest on the Series 2022 Bonds to be subject, directly or indirectly, in whole or in part, to federal income taxation or to be subject to or exempted from state income taxation, or otherwise prevent Beneficial Owners from realizing the full current benefit of the tax status of such interest. The introduction or enactment of any such legislative proposals or clarification of the Code or court decisions may also affect, perhaps significantly, the market price for, or marketability of, the Series 2022 Bonds. Prospective purchasers of the Series 2022 Bonds should consult their own tax advisors regarding the potential impact of any pending or proposed federal or state tax legislation, regulations or litigation, as to which Bond Counsel expresses no opinion.

The opinion of Bond Counsel is based on current legal authority, covers certain matters not directly addressed by such authorities, and represents Bond Counsel's judgment as to the proper treatment of the Series 2022 Bonds for federal income tax purposes. It is not binding on the Internal Revenue Service ("IRS") or the courts. Furthermore, Bond Counsel cannot give and has not given any opinion or assurance about the future activities of the District, or about the effect of future changes in the Code, the applicable regulations, the interpretation thereof or the enforcement thereof by the IRS. The District has covenanted, however, to comply with the requirements of the Code.

Bond Counsel's engagement with respect to the Series 2022 Bonds ends with the issuance of the Series 2022 Bonds, and, unless separately engaged, Bond Counsel is not obligated to defend the District or the Beneficial Owners regarding the tax-exempt status of the Series 2022 Bonds in the event of an audit examination by the IRS. Under current procedures, Beneficial Owners would have little, if any, right to participate in the audit examination process. Moreover, because achieving judicial review in connection with an audit examination of tax-exempt bonds is difficult, obtaining an independent review of IRS positions with which the District legitimately disagrees, may not be practicable. Any action of the IRS, including but not limited to selection of the Series 2022 Bonds for audit, or the course or result of such audit, or an audit of bonds presenting similar tax issues may affect the market price for, or the marketability of, the Series 2022 Bonds, and may cause the District or the Beneficial Owners to incur significant expense.

Payments on the Series 2022 Bonds generally will be subject to U.S. information reporting and possibly to "backup withholding." Under Section 3406 of the Code and applicable U.S. Treasury Regulations issued thereunder, a non-corporate Beneficial Owner of Series 2022 Bonds may be subject to backup withholding with respect to "reportable payments," which include interest paid on the Series 2022 Bonds and the gross proceeds of a sale, exchange, redemption, retirement or other disposition of the Series 2022 Bonds.

The payor will be required to deduct and withhold the prescribed amounts if (i) the payee fails to furnish a U.S. taxpayer identification number ("TIN") to the payor in the manner required, (ii) the IRS notifies the payor that the TIN furnished by the payee is incorrect, (iii) there has been a "notified payee underreporting" described in Section 3406(c) of the Code or (iv) the payee fails to certify under penalty of perjury that the payee is not subject to withholding under Section 3406(a)(1)(C) of the Code. Amounts withheld under the backup withholding rules may be refunded or credited against a Beneficial Owner's federal income tax liability, if any, provided that the required information is timely furnished to the IRS. Certain Beneficial Owners (including among others, corporations and certain tax-exempt organizations) are not subject to backup withholding. The failure to comply with the backup withholding rules may result in the imposition of penalties by the IRS.

ABSENCE OF LITIGATION

In connection with the issuance of the Series 2022 Bonds, Best Best & Krieger LLP ("Issuer's Counsel") will deliver an opinion to the effect that, to Issuer's Counsel's current actual knowledge, there is no action, suit, proceeding or investigation at law or in equity before or by any court, public board or body, pending (notice of which has been served on the City or the District) or to the Issuer's Counsel's current actual knowledge, threatened, wherein an unfavorable decision, ruling or finding, against or affecting the City or the District, would adversely impact the ability of the City or the District to complete the transactions described in, or contemplated by, the Indenture or this Official Statement, restrain or enjoin the collection of the Special Taxes, or in any way contest or affect the validity of the Series 2022 Bonds, the Indenture, the Special Taxes, or the transactions described herein.

ABSENCE OF RATINGS

The District has not made, and does not contemplate making, application to any rating organization for a rating on the Series 2022 Bonds.

CERTAIN LEGAL MATTERS

The validity of the Series 2022 Bonds and certain other legal matters are subject to the approving opinion of Orrick, Herrington & Sutcliffe LLP, Bond Counsel to the District. A copy of the form of such approving opinion is attached hereto as APPENDIX D. Copies of such approving opinion will accompany each Series 2022 Bond. Bond Counsel has not undertaken any responsibility for the accuracy, completeness or fairness of the Official Statement or other offering materials relating to the Series 2022 Bonds and expresses no opinion relating thereto. Certain legal matters will be passed upon for the City and the District by the Issuer's Counsel and by Stradling Yocca Carlson & Rauth, a Professional Corporation, Newport Beach, California, as Disclosure Counsel. Certain legal matters will be passed upon for the Underwriter by its counsel, Jones Hall, A Professional Law Corporation, San Francisco, California.

Although it is serving as Bond Counsel to the District in connection with the issuance and sale of the Series 2022 Bonds, Bond Counsel represents the Underwriter in connection with other financings and matters unrelated to the Series 2022 Bonds. Disclosure Counsel and the Issuer's Counsel also represent the Underwriter in connection with other financings and matters unrelated to the Series 2022 Bonds.

UNDERWRITING

The Series 2022 Bonds are being purchased by Stifel, Nicolaus & Company, Incorporated (the "Underwriter"). The Underwriter has agreed to purchase the Series 2022 Bonds at a price of $_____ (being the $_____ aggregate principal amount thereof, plus original issue premium of $_____ and less Underwriter's discount of $_____). The purchase agreement relating to the Series 2022 Bonds provides that the Underwriter will purchase all of the Series 2022 Bonds if any are purchased. The obligation to make such purchase is subject to certain terms and conditions set forth in the purchase agreement, the approval of certain legal matters by counsel and certain other conditions.

The Underwriter has entered into an agreement with its affiliate, Vining-Sparks IBG, LLC ("Vining-Sparks") for the distribution of certain municipal securities offerings at the original issue price. Pursuant to that distribution agreement, Vining-Sparks may purchase Bonds from the Underwriter at the original issue price less a negotiated portion of the selling concession applicable to any Bonds that Vining-Sparks sells.

The Underwriter may offer and sell the Series 2022 Bonds to certain dealers and others at prices lower than the offering price stated on the cover page thereof. The offering price may be changed from time to time by the Underwriter.

FINANCIAL INTERESTS

The fees being paid to the Municipal Advisor, Bond Counsel, Disclosure Counsel, Underwriter, and Underwriter's Counsel are contingent upon the issuance and delivery of the Series 2022 Bonds.

MUNICIPAL ADVISOR

The District has retained CSG Advisors Incorporated, San Francisco, California, as municipal advisor (the "Municipal Advisor") for the sale of the Series 2022 Bonds. The Municipal Advisor is not obligated to undertake, and has not undertaken to make, an independent verification or to assume any responsibility for the accuracy, completeness or fairness of the information contained in this Official Statement.

CSG Advisors Incorporated is an independent advisory firm and is not engaged in the business of underwriting, trading or distributing municipal or other public securities.

ADDITIONAL INFORMATION

The purpose of this Official Statement is to supply information to prospective buyers of the Series 2022 Bonds. Quotations and summaries and explanations of the Series 2022 Bonds and documents contained in this Official Statement do not purport to be complete, and reference is made to such documents for full and complete statements and their provisions.

The execution and delivery of this Official Statement by the City Manager of the City has been duly authorized by the City Council of the City of Ontario acting in its capacity as the legislative body of the District.

CITY OF ONTARIO
COMMUNITY FACILITIES DISTRICT NO. 54
(ESPERANZA FACILITIES)

By: _____
City Manager

APPENDIX A

AMENDED AND RESTATED RATE AND METHOD OF APPORTIONMENT OF SPECIAL TAX

APPENDIX B

APPRAISAL REPORT

APPENDIX C

PRICE POINT STUDY

APPENDIX D

FORM OF OPINION OF BOND COUNSEL

[TO BE ATTACHED]

APPENDIX E

GENERAL INFORMATION CONCERNING THE CITY OF ONTARIO

This appendix sets forth general information about the City of Ontario (the "City") including information with respect to its finances. The following information concerning the City, the County of San Bernardino (the "County") and the State are included only for general background purposes regarding the area encompassing the District. The Series 2022 Bonds are special, limited obligations of the District, payable, as provided in the Indenture, solely from Net Special Tax Revenues and the other assets pledged therefor thereunder. Neither the faith and credit nor the taxing power of the District (except to the limited extent set forth in the Indenture), the City or the State of California (the "State"), or any political subdivision thereof, is pledged to the payment of the Series 2022 Bonds.

The City is located in western San Bernardino County, 35 miles inland from downtown Los Angeles and encompasses 50 square miles. Located in the western part of the Inland Empire region, it lies just east of the Los Angeles county line and is part of the Greater Los Angeles Area. The City is home to the LA/Ontario International Airport which is the 15th busiest cargo airport in the United States. Ontario handles the mass of freight traffic between the ports of Los Angeles and Long Beach and the rest of the country.

Government

The City was incorporated as a general law city in 1891, and is governed by a Mayor and four council members elected at large to serve four-year terms. The City operates under the Council - Manager form of government. The City Council appoints the City Manager who is responsible for the day-to-day administration of City business and the coordination of all departments of the City.

The population growth in the City, County and State is shown on the following chart.

POPULATION ESTIMATES
City of Ontario, County of San Bernardino and State of California
2014-2021

Year[(1)]	*City of Ontario*	*County of San Bernardino*	*State of California*
2014	167,885	2,094,951	38,556,731
2015	169,153	2,112,187	38,865,532
2016	169,491	2,122,579	39,103,587
2017	172,858	2,139,520	39,352,398
2018	175,083	2,150,017	39,519,535
2019	178,606	2,165,876	39,605,361
2020	180,788	2,175,424	39,648,938
2021	182,004	2,175,909	39,466,855

(1) January 1 data.

Source: State of California, Department of Finance, E-4 Population Estimates for Cities, Counties and State, 2011-2021, with 2010 Benchmark.

Employment

The following table summarizes the labor force, employment and unemployment figures for the years 2015 through 2020 for the City, the County, the State and the United States.

CIVILIAN LABOR FORCE, EMPLOYMENT AND UNEMPLOYMENT RATE
City of Ontario, San Bernardino County, State of California and United States
2015 through 2020[1]

Year and Area	*Labor Force*	*Employment[2]*	*Unemployment[3]*	*Unemployment Rate (%)*
2015				
City of Ontario	81,900	76,600	5,300	6.5%
San Bernardino County	920,000	860,800	59,200	6.4
State of California	18,851,100	17,681,800	1,169,200	6.2
United States	157,130,000	148,834,000	8,296,000	5.3
2016				
City of Ontario	82,700	78,400	4,300	5.2%
San Bernardino County	930,200	876,400	53,900	5.8
State of California	19,012,000	17,965,400	1,046,600	5.5
United States	159,187,000	151,436,000	7,751,000	4.9
2017				
City of Ontario	84,500	80,800	3,700	4.4%
San Bernardino County	942,700	895,900	46,800	5.0
State of California	19,173,800	18,246,800	927,000	4.8
United States	160,320,000	153,337,000	6,982,000	4.4
2018				
City of Ontario	87,700	84,500	3,200	3.6%
San Bernardino County	955,100	915,700	39,400	4.1
State of California	19,263,900	18,442,400	821,500	4.3
United States	162,075,000	155,761,000	6,314,000	3.9
2019				
City of Ontario	88,800	85,800	3,000	3.4%
San Bernardino County	965,000	927,400	37,600	3.9
State of California	19,353,700	18,550,500	803,200	4.2
United States	163,539,000	157,538,000	6,001,000	3.7
2020				
City of Ontario	90,100	82,100	8,000	8.9%
San Bernardino County	966,200	874,900	91,300	9.4
State of California	18,821,200	16,913,100	1,908,100	10.1
United States	160,742,000	147,795,000	12,947,000	8.1

Note: Data is not seasonally adjusted.
(1) Annual averages, unless otherwise specified.
(2) Includes persons involved in labor-management trade disputes.
(3) The unemployment rate is computed from unrounded data; therefore, it may differ from rates computed from rounded figures in this table.
Source: U.S. Department of Labor – Bureau of Labor Statistics, California Employment Development Department. 2020 Benchmark.

Listed below are the major employers in the City for Fiscal Year 2019-20 and in the County for Fiscal Year 2019-20.

PRINCIPAL EMPLOYERS
City of Ontario
Fiscal Year 2019-20

Employer	*Number of Employees*
Ontario International Airport	5,000 to 9,999
United Parcel Services (UPS)	5,000 to 9,999
Ontario Montclair School District	1,000 to 4,999
Niagara Bottling LLC	1,000 to 4,999
Chaffey Joint Union High School District	1,000 to 4,999
Home Depot	500 to 999
ULINE	500 to 999
FedEx	500 to 999
Cardinal Health	500 to 999
Walmart #3796	250 to 499
Gold Star Foods Inc	250 to 499
Autozone	250 to 499
Toyota Motor Sales	250 to 299
Ventura Foods	250 to 499
Mag Instrument Inc.	250 to 499
Staples	250 to 499
Ajinimoto Windsor	250 to 499
Cardenas Markets LLC	250 to 499

Source: City of Ontario Comprehensive Annual Financial Report for the year ending June 30, 2020.

PRINCIPAL EMPLOYERS
San Bernardino County
2021

Rank	*Name of Business*	*Approximate No. of San Bernardino County Employees*[(1)]	*Type of Business*
1	County of San Bernardino	≥10,000	Public Administration
2	Loma Linda University	≥10,000	Education
3	Amazon	5,000-9,999	Electronic Commerce
4	Ontario International Airport	5,000-9,999	Airport
5	Plaxicon Holding Corporation	5,000-9,999	Plastics Manufacturer
6	California State University, San Bernardino	5,000-9,999	Medical Center
7	James Jones Company	2,500-4,999	Water Products
8	Barrett Business Services, Inc.	2,500-4,999	Management Consulting
9	Damao Luggage International Inc.	2,500-4,999	Retailer
10	San Manuel Tribe & Casino	2,500-4,999	Casino

(1) Due to confidentiality of reporting number of employees, ranges have been provided.
Source: San Bernardino County Comprehensive Annual Report for the year ending June 30, 2021.

Industries

Residents of the City find employment throughout the Riverside-San Bernardino-Ontario Labor Market Area. This labor market area, as defined for reporting purposes by the California Employment Development Department, has boundaries coterminous with those of Riverside and San Bernardino Counties. The following table sets forth certain employment data for the Riverside - San Bernardino-Ontario Metropolitan Statistical Area and the County for the period from 2016 through 2020.

RIVERSIDE-SAN BERNARDINO-ONTARIO METROPOLITAN STATISTICAL AREA
INDUSTRY EMPLOYMENT & LABOR FORCE - BY ANNUAL AVERAGE

	2016	*2017*	*2018*	*2019*	*2020*
Civilian Labor Force	1,981,900	2,014,300	2,045,200	2,070,700	2,073,900
Civilian Employment	1,863,600	1,910,800	1,957,200	1,986,100	1,872,600
Civilian Unemployment	118,300	103,500	88,000	84,600	201,300
Civilian Unemployment Rate	6.0%	5.1%	4.3%	4.1%	9.7%
Total Farm	14,600	14,500	14,500	15,400	13,900
Total Nonfarm	1,401,400	1,452,800	1,506,000	1,552,100	1,487,800
Total Private	1,159,100	1,201,800	1,248,800	1,290,900	1,238,700
Goods Producing	190,400	196,400	206,100	208,900	200,500
Mining and Logging	900	1,000	1,200	1,200	1,300
Construction	92,000	97,400	105,200	107,200	105,000
Manufacturing	97,500	98,000	99,800	100,600	94,300
Service Providing	1,211,000	1,256,400	1,299,300	1,343,200	1,287,400
Trade, Transportation and Utilities	346,300	363,400	378,800	394,400	403,800
Wholesale Trade	61,600	62,600	65,500	67,100	64,600
Retail Trade	178,300	180,900	181,200	180,700	168,800
Transportation, Warehousing and Utilities	106,400	119,900	132,100	146,600	170,500
Information	11,800	11,600	11,400	11,500	9,400
Financial Activities	44,900	44,700	44,600	45,000	43,700
Professional and Business Services	145,100	147,300	152,000	158,700	154,000
Educational and Health Services	215,700	226,700	239,500	250,300	248,700
Leisure and Hospitality	160,200	166,300	170,600	175,900	139,200
Other Services	44,600	45,400	45,800	46,200	39,600
Government	242,300	251,000	257,200	261,200	249,100
Total, All Industries	1,416,000	1,467,300	1,520,500	1,567,500	1,501,800

Note: Does not include proprietors, self-employed, unpaid volunteers or family workers, domestic workers in households and persons involved in labor-management trade disputes. Employment reported by place of work. Items may not add to total due to independent rounding. The "Total, All Industries" data is not directly comparable to the employment data found in this Appendix E.

Source: State of California, Employment Development Department, March 2020 Benchmark.

Personal Income

The following tables show the personal income and per capita personal income for the City, County, State of California and United States from 2014 through 2020.

PERSONAL INCOME
City of Ontario, County of San Bernardino, State of California, and United States
2014-2020

Year	*City of Ontario*	*County of San Bernardino*	*California*	*United States*
2014	$3,100,249	$70,474,192	$1,980,736,837	$14,969,527,000
2015	3,224,189	74,846,227	2,125,430,316	15,681,233,000
2016	3,159,733	77,937,754	2,218,457,774	16,092,713,000
2017	3,444,006	80,570,617	2,318,644,417	16,845,028,000
2018	3,474,794	83,984,928	2,431,821,953	17,681,159,000
2019	3,826,610	88,261,041	2,544,234,978	18,402,004,000
2020	4,114,067	98,143,792	2,763,311,977	19,607,447,000

Note: Dollars in Thousands.
Source: U.S. Department of Commerce, Bureau of Economic Analysis and City of Ontario Comprehensive Annual Financial Report for the year ending June 30, 2020.

PER CAPITA PERSONAL INCOME[(1)]
City of Ontario, County of San Bernardino, State of California, and United States
2014-2020

Year	*City of Ontario*	*County of San Bernardino*	*California*	*United States*
2014	$18,774	$33,586	$51,332	$47,071
2015	19,068	35,399	54,632	48,891
2016	18,601	36,578	56,667	49,812
2017	19,761	37,477	58,942	51,811
2018	19,761	38,781	61,663	54,098
2019	21,129	40,537	64,513	56,047
2020	22,237	44,831	70,192	59,510

(1) Per capita personal income is the total personal income divided by the total mid-year population estimates of the U.S. Bureau of the Census. All dollar estimates are in current dollars (not adjusted for inflation).
Source: City of Ontario Comprehensive Annual Financial Report for the year ending June 30, 2020, Bureau of Economic Analysis for County, State and U.S.

Assessed Valuation

The table below sets forth the City's assessed valuation of property for Fiscal Years 2012-13 through 2019-20.

ASSESSED VALUATION OF TAXABLE PROPERTY
City of Ontario
Fiscal Years 2012-13 to 2019-20
(Dollars in Thousands)

Fiscal Year Ended June 30	*Secured Value*	*Unsecured Value*	*Less Exemptions*	*Total Assessed and Estimated Full Value*
2013	$12,065,269	$1,788,106	$(112,198)	$13,741,177
2014	12,465,751	1,758,596	(110,182)	14,114,165
2015	12,413,859	2,552,384	(108,252)	14,857,991
2016	13,124,582	2,611,079	(105,864)	15,629,797
2017	13,781,901	2,543,614	(109,080)	16,216,435
2018	14,844,332	2,624,317	(108,915)	17,359,734
2019	16,575,762	2,814,842	(108,701)	19,281,903
2020	18,181,749	2,910,729	(110,654)	20,981,823

Source: City of Ontario Comprehensive Annual Financial Report for the year ending June 30, 2020.

Tax Levy and Tax Collection

Below is a chart which indicates the tax levy and collection records for the City from the 2010-11 through 2019-20 Fiscal Years.

PROPERTY TAX LEVIES AND COLLECTIONS
City of Ontario
Fiscal Years 2010-11 to 2019-20

Fiscal Year	*Percent of Levy Collected*	*Total Tax Collections to Tax Levy to Date*[(1)]
2011	100.31%	$23,681,467
2012	98.47	23,550,698
2013	100.86	24,282,466
2014	101.90	25,330,619
2015	101.87	26,352,321
2016	101.39	27,777,778
2017	100.94	28,866,121
2018	101.46	30,921,494
2019	100.69	34,087,147
2020	99.67	36,753,080

(1) Beginning with the City's Comprehensive Annual Financial Report for the year ending June 30, 2019, the City did not include in its reported property tax collections pass-through payments related to the former Ontario Redevelopment Agency or Redevelopment Property Tax Trust Fund residual payments. The historical property tax collection amounts have been adjusted to reflect this change.

Source: City of Ontario Comprehensive Annual Financial Report for the year ending June 30, 2020.

Largest Taxpayers

The principal property taxpayers in the City for Fiscal Year 2019-20 are as follows:

PRINCIPAL PROPERTY TAXPAYERS
City of Ontario
Fiscal Year 2019-20

Taxpayer	*Assessed Valuation*	*% of Total Assessed Valuation*
Prologis	$ 554,212,904	2.01%
United Parcel Service Co	524,431,546	1.90
Ontario Mills LP	409,216,412	1.48
Vineyard Industrial I LLC	287,535,637	1.04
Watson Land Company	249,455,066	0.90
Rexford Industrial Realty LP	225,730,467	0.82
Catellus Finance 1 LLC	213,113,375	0.77
Roc III California Terracina LLC	150,849,527	0.55
Comref So California Industrial LLC	146,683,701	0.53
Majestic-CCC IV Partners	139,677,379	0.51
TOTAL:	$ 2,900,906,014	10.52%

Source: City of Ontario Comprehensive Annual Financial Report for the year ending June 30, 2020.

Building Activity

In addition to annual building permit valuations, the numbers of permits for new dwelling units issued each year from 2016 through 2020 are shown in the following tables for both the County and the City.

BUILDING PERMIT VALUATIONS
San Bernardino County
2016-2020

	2016	*2017*	*2018*	*2019*	*2020*
Valuation ($000's)					
Residential	$ 888,142	$ 1,366,023	$ 1,455,281	$ 1,450,638	$ 1,139,459
Non-Residential	994,282	1,285,597	1,080,130	1,377,100	1,064,696
Total	$ 1,882,423	$ 2,651,620	$ 2,535,411	$ 2,827,738	$ 2,204,155
Units					
Single Family	2,896	4,235	3,311	4,182	3,631
Multiple Family	976	2,578	1,775	1,884	910
Total	3,872	6,831	5,086	6,066	4,541

Note: Totals may not add to sum because of rounding.
Source: Construction Industry Research Board.

BUILDING PERMIT VALUATIONS
City of Ontario
2016-2020

	2016	*2017*	*2018*	*2019*	*2020*
Valuation ($000's)					
Residential	$ 119,456	$ 239,932	$ 517,399	$ 322,837	$ 114,159
Non-Residential	197,786	122,243	185,202	268,019	125,537
Total	$ 317,242	$ 362,175	$ 702,600	$ 590,856	$ 239,696
Units					
Single Family	446	648	1,056	1,091	472
Multiple Family	206	1,010	273	322	74
Total	652	1,658	1,329	1,413	546

Note: Totals may not add to sum because of rounding.
Source: Construction Industry Research Board.

Taxable Sales

The table below presents taxable sales for the years 2014 through 2020 for the City.

TAXABLE SALES
City of Ontario
2014 through 2020
(Dollars in Thousands)

Year	*Retail and Food Permits*	*Retail and Food Taxable Transactions*	*Total Permits*	*Total Outlets Taxable Transactions*
2014	4,422	$4,166,601	6,647	$6,595,978
2015[(1)]	4,867	4,279,949[(1)]	7,580	7,174,748[(1)]
2016	4,875	4,634,312	7,658	8,124,275
2017	4,974	4,775,352	7,888	7,670,943
2018	5,194	4,850,172	8,435	7,939,125
2019	5,306	4,953,629	8,830	8,186,154
2020	5,692	4,416,993	9,543	7,584,137

(1) Beginning in 2015, the outlet counts in these reports show the number of outlets that were active during the reporting period. Retailers that operate part-time are now tabulated with store retailers. Industry-level data for 2015 are not comparable to that of prior years.

Source: "Taxable Sales in California (Sales & Use Tax)" - California State Board of Equalization for 2014; Taxable Sales in California, California Department of Tax and Fee Administration for 2015-2020.

The table below presents taxable sales for the years 2014 through 2020 for the County.

TAXABLE SALES
San Bernardino County
2014 through 2020
(Dollars in Thousands)

Year	*Retail and Food Permits*	*Retail and Food Taxable Transactions*	*Total Permits*	*Total Outlets Taxable Transactions*
2014	34,555	$22,240,376	48,349	$33,055,967
2015[(1)]	37,696	23,384,548[(1)]	56,128	35,580,276[(1)]
2016	38,370	24,477,003	57,629	37,216,551
2017	39,067	25,603,171	58,956	38,399,373
2018	39,837	26,905,784	61,838	40,554,024
2019	40,964	27,585,905	64,771	41,768,748
2020	44,330	28,745,277	71,145	43,265,512

(1) Beginning in 2015, the outlet counts in these reports show the number of outlets that were active during the reporting period. Retailers that operate part-time are now tabulated with store retailers. Industry-level data for 2015 are not comparable to that of prior years.

Source: "Taxable Sales in California (Sales & Use Tax)" - California State Board of Equalization for 2014; Taxable Sales in California, California Department of Tax and Fee Administration for 2015-2020.

Transportation

Because Ontario is a major hub for passengers and freight, the City is also served by several major freeways. Interstate 10 and the Pomona Freeway (State Route 60) run east-west through the City. Interstate 10 is north of the Ontario airport while the Pomona freeway is south of the airport. Interstate 15 runs in the north-south directions at the eastern side of the City. State Route 83, also known as Euclid Avenue, also runs in the north-south direction at the western side of the City.

The City maintains an Amtrak station which is served by the Sunset Limited and Texas Eagle lines. Ontario also has a Metrolink station off of Haven Avenue. It connects Ontario with much of the Greater Los Angeles area, Orange County and the San Fernando Valley. Public bus transportation is provided by Omnitrans. Rail service is provided by Burlington Northern Santa Fe and Union Pacific.

The Ontario International Airport is a medium-hub, full-service airport, which offers more than 70 daily flights to cities in the U.S., Mexico and Taiwan and is served by AeroMexico, Alaska Airlines, American Airlines, China Airlines, Delta Air Lines, Frontier, JetBlue, Southwest Airlines, United Airlines/United Express and Volaris. The airport's service area includes a population of approximately six million in San Bernardino and Riverside counties, and portions of Orange and Los Angeles counties. The Ontario International Airport was previously operated by the Department of Airports of the City of Los Angeles (the "Department"). Following protracted litigation among the Department, the City of Ontario and the Ontario International Airport Authority, a joint powers authority was formed by the City of Ontario and the County of San Bernardino (the "Airport Authority"). The Airport Authority assumed ownership and control of the management and operation of the Ontario International Airport on November 1, 2016.

With approximately 570,000 square feet and 26 passenger gates within two terminals, Ontario International Airport is the Western States Regional Terminal for United Parcel Service. In 2019 over approximately 5.9 million passengers used the airport and cargo shipments rose more than 4% from the previous year. In 2020, approximately 2.5 million passengers used the airport and cargo shipments rose more than 18% from the previous year.

APPENDIX F

SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE

The following is a summary of certain provisions of the Indenture which are not described elsewhere in the Official Statement. This summary does not purport to be comprehensive, and reference should be made to the Indenture for a full and complete statement of their provisions.

[TO COME FROM BOND COUNSEL]

APPENDIX G

FORM OF DISTRICT
CONTINUING DISCLOSURE AGREEMENT

[TO COME FROM BOND COUNSEL]

APPENDIX H

FORM OF DEVELOPER CONTINUING DISCLOSURE AGREEMENT

APPENDIX I

INFORMATION CONCERNING THE DEPOSITORY TRUST COMPANY AND ITS BOOK-ENTRY SYSTEM

The information in this section concerning DTC and DTC's book-entry only system has been obtained from sources that the District believes to be reliable, but the District takes no responsibility for the completeness or accuracy thereof. The following description of the procedures and record keeping with respect to beneficial ownership interests in the Series 2022 Bonds, payment of principal, premium, if any, accreted value and interest on the Series 2022 Bonds to DTC Participants or Beneficial Owners, confirmation and transfers of beneficial ownership interests in the Series 2022 Bonds and other related transactions by and between DTC, the DTC Participants and the Beneficial Owners is based solely on information provided by DTC to the District which the District believes to be reliable, but the District and the Underwriter do not and cannot make any independent representations concerning these matters and do not take responsibility for the accuracy or completeness thereof. Neither the DTC, Direct Participants, Indirect Participants nor the Beneficial Owners should rely on the foregoing information with respect to such matters, but should instead confirm the same with DTC or the DTC Participants, as the case may be.

The Depository Trust Company ("DTC"), New York, New York, will act as securities depository for the Series 2022 Bonds. The Series 2022 Bonds will be issued as fully-registered securities registered in the name of Cede & Co. (DTC's partnership nominee) or such other name as may be requested by an authorized representative of DTC. One fully-registered Bond will be issued for each annual maturity of the Series 2022 Bonds, each in the aggregate principal amount of such maturity, and will be deposited through the facilities of DTC.

DTC, the world's largest securities depository, is a limited-purpose trust company organized under the New York Banking Law, a "banking organization" within the meaning of the New York Banking Law, a member of the Federal Reserve System, a "clearing corporation" within the meaning of the New York Uniform Commercial Code, and a "clearing agency" registered pursuant to the provisions of Section 17A of the Securities Exchange Act of 1934. DTC holds and provides asset servicing for over 3.6 million issues of U.S. and non-U.S. equity issues, corporate and municipal debt issues, and money market instruments (from over 100 countries) that DTC's participants ("Direct Participants") deposit with DTC. DTC also facilitates the post trade settlement among Direct Participants of sales and other securities transactions in deposited securities, through electronic computerized book-entry transfers and pledges between Direct Participants' accounts. This eliminates the need for physical movement of securities certificates. Direct Participants include both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, clearing corporations, and certain other organizations. DTC is a wholly-owned subsidiary of The Depository Trust & Clearing Corporation ("DTCC"). DTCC is the holding company for DTC, National Securities Clearing Corporation and Fixed Income Clearing Corporation, all of which are registered clearing agencies. DTCC is owned by the users of its regulated subsidiaries. Access to the DTC system is also available to others such as both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, and clearing corporations that clear through or maintain a custodial relationship with a Direct Participant, either directly or indirectly ("Indirect Participants"). DTC has a Standard & Poor's rating of "AA+." The DTC Rules applicable to its Participants are on file with the Securities and Exchange Commission. More information about DTC can be found at *www.dtcc.com*.

Purchases of Series 2022 Bonds under the DTC system must be made by or through Direct Participants, which will receive a credit for the Series 2022 Bonds on DTC's records. The ownership interest of each actual purchaser of each Bond ("Beneficial Owner") is in turn to be recorded on the Direct and Indirect Participants' records. Beneficial Owners will not receive written confirmation from DTC of their purchase. Beneficial Owners are, however, expected to receive written confirmations providing details of the transaction, as well as periodic statements of their holdings, from the Direct or Indirect Participant through which the Beneficial Owner entered into the transaction. Transfers of ownership interests in the Series 2022 Bonds are to be accomplished by entries made on the books of Direct and Indirect Participants acting on behalf of Beneficial Owners. Beneficial Owners will not receive Series 2022 Bonds representing their ownership interests in Series 2022 Bonds, except in the event that use of the book-entry system for the Series 2022 Bonds is discontinued.

To facilitate subsequent transfers, all Bonds deposited by Direct Participants with DTC are registered in the name of DTC's partnership nominee, Cede & Co., or such other name as may be requested by an authorized representative of DTC. The deposit of Bonds with DTC and their registration in the name of Cede & Co. or such other DTC nominee do not effect any change in beneficial ownership. DTC has no knowledge of the actual Beneficial

Owners of the Series 2022 Bonds; DTC's records reflect only the identity of the Direct Participants to whose accounts such Series 2022 Bonds are credited, which may or may not be the Beneficial Owners. The Direct and Indirect Participants will remain responsible for keeping account of their holdings on behalf of their customers.

Conveyance of notices and other communications by DTC to Direct Participants, by Direct Participants to Indirect Participants, and by Direct Participants and Indirect Participants to Beneficial Owners will be governed by arrangements among them, subject to any statutory or regulatory requirements as may be in effect from time to time. Beneficial Owners of Series 2022 Bonds may wish to take certain steps to augment the transmission to them of notices of significant events with respect to the Series 2022 Bonds, such as prepayments, tenders, defaults, and proposed amendments to the Series 2022 Bond documents. For example, Beneficial Owners of Series 2022 Bonds may wish to ascertain that the nominee holding the Series 2022 Bonds for their benefit has agreed to obtain and transmit notices to Beneficial Owners. In the alternative, Beneficial Owners may wish to provide their names and addresses to the registrar and request that copies of notices be provided directly to them.

Redemption notices shall be sent to DTC. If less than all of the Series 2022 Bonds within a maturity are being prepaid, DTC's practice is to determine by lot the amount of the interest of each Direct Participant in such maturity to be redeemed.

Neither DTC nor Cede & Co. (nor any other DTC nominee) will consent or vote with respect to Series 2022 Bonds unless authorized by a Direct Participant in accordance with DTC's MMI Procedures. Under its usual procedures, DTC mails an Omnibus Proxy to the District as soon as possible after the record date. The Omnibus Proxy assigns Cede & Co.'s consenting or voting rights to those Direct Participants to whose accounts Series 2022 Bonds are credited on the record date (identified in a listing attached to the Omnibus Proxy).

Redemption proceeds, distributions, and dividend payments on the Series 2022 Bonds will be made to Cede & Co., or such other nominee as may be requested by an authorized representative of DTC. DTC's practice is to credit Direct Participants' accounts upon DTC's receipt of funds and corresponding detail information from the District or the Trustee, on payable date in accordance with their respective holdings shown on DTC's records. Payments by Participants to Beneficial Owners will be governed by standing instructions and customary practices, as is the case with securities held for the accounts of customers in bearer form or registered in "street name," and will be the responsibility of such Participant and not of DTC, the Trustee, or the District, subject to any statutory or regulatory requirements as may be in effect from time to time. Payment of redemption proceeds, distributions, and dividend payments to Cede & Co. (or such other nominee as may be requested by an authorized representative of DTC) is the responsibility of the District or the Trustee, disbursement of such payments to Direct Participants will be the responsibility of DTC, and disbursement of such payments to the Beneficial Owners will be the responsibility of Direct and Indirect Participants.

A Series 2022 Bond Owner shall give notice to elect to have its Series 2022 Bonds purchased or tendered, through its Participant, to the Trustee, and shall effect delivery of such Series 2022 Bonds by causing the Direct Participant to transfer the Participant's interest in the Series 2022 Bonds, on DTC's records, to the Trustee. The requirement for physical delivery of Series 2022 Bonds in connection with an optional tender or a mandatory purchase will be deemed satisfied when the ownership rights in the Series 2022 Bonds are transferred by Direct Participants on DTC's records and followed by a book-entry credit of tendered Series 2022 Bonds to the Trustee's DTC account.

DTC may discontinue providing its services as depository with respect to the Series 2022 Bonds at any time by giving reasonable notice to the District or the Trustee. Under such circumstances, in the event that a successor depository is not obtained, physical certificates are required to be printed and delivered.

The District may decide to discontinue use of the system of book-entry only transfers through DTC (or a successor securities depository). In that event, Series 2022 Bonds will be printed and delivered to DTC.

THE TRUSTEE, AS LONG AS A BOOK-ENTRY ONLY SYSTEM IS USED FOR THE SERIES 2022 BONDS, WILL SEND ANY NOTICE OF REDEMPTION OR OTHER NOTICES TO OWNERS ONLY TO DTC. ANY FAILURE OF DTC TO ADVISE ANY DTC PARTICIPANT, OR OF ANY DTC PARTICIPANT TO NOTIFY ANY BENEFICIAL OWNER, OF ANY NOTICE AND ITS CONTENT OR EFFECT WILL NOT AFFECT THE VALIDITY OF SUFFICIENCY OF THE PROCEEDINGS RELATING TO THE REDEMPTION OF THE SERIES 2022 BONDS CALLED FOR REDEMPTION OR OF ANY OTHER ACTION PREMISED ON SUCH NOTICE.